THE LONDON JOURNAL OF Arts and Sciences;

CONTAINING

FULL DESCRIPTIONS OF THE PRINCIPLES AND DETAILS OF

EVERY NEW PATENT,

ALSO

Original Communications

ON OBJECTS CONNECTED WITH

SCIENCE AND PHILOSOPHY,

PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

IN

Practical Mechanics.

BY W. NEWTON,

CIVIL ENGINEER AND MECHANICAL DRAFTSMAN:

AND BY C. F. PARTINGTON,

OF THE LONDON INSTITUTION.

VOL. I.

[SECOND SERIES.]

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THE

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JOURNAL OF ARTS AND SCIENCES.

No. II,

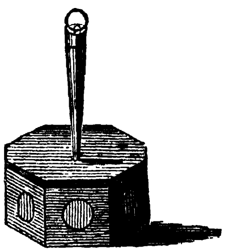
[SECOND SERIES.]

Original Communications.

ART. VI.—DESCRIPTION OF AN ANEMOSCOPE FOR ASCERTAINING THE COURSE OF THE AIR, WHEN THERE IS NOT ANY PERCEPTIBLE WIND BLOWING.

Communicated in a letter to the Editors of the London Journal of Arts and Sciences.

GENTLEMEN.—Several years ago I contrived an instrument for shewing by evaporation the direction of the currents of air in calm weather, when there was not any perceptible wind. The following is a description of its arrangement and the method of using it.



The above instrument consists of an octangular tin box, with a circular opening in each of the sides; within the box, pieces of blotting paper are fastened, which cover the openings. On the top or lid of the box, is a tin tube or socket, in which is a cork with a ring. The ring is to suspend the apparatus from a tree in the air. If desirable, the box may be reversed and elevated on a pole, the upper end of which is to fit into the tin tube. The method of using this instrument, is to equally wet all the portions of blotting paper which appear through the holes, and then elevate it, and after it has been exposed a short time to the air, it is to be noticed, which portion of blotting paper has dried most. I think thin slabs of slate, or of stone, which easily give out moisture, would be far preferable to using blotting paper. This instrument is founded on the principle by which, I have understood, sailors ascertain the course of the air in a calm, which is, by wetting a finger, and holding it up in the air, then by feeling which part becomes (by evaporation) cool, they judge from whence the current of air flows. It is obvious that when the sun shines, erroneous conclusions may be made without due attention.

B. M. FORSTER.

Walthamstow, Essex,
7th April, 1828

ART. VII.—NEW MODE OF VIEWING THE SPOTS ON THE SUN'S DISC. BY KNIGHT SPENCER, ESQ.

To the Editors of the London Journal of Science, &c.

GENTLEMEN.—The enquiry into the physical properties of the sun, and the nature of the spots so frequently seen on his disc, seems for some time to have remained stationary, yet the inquisitive mind is still desirous to know something more, and, to me it is matter of surprise, that the following simple and easy mode of observing this luminary, has not been published, in any of the scientific journals, as I believe, nor in any of the Cyclopædias, which I have examined; it has, however, afforded myself and friends

—if not useful knowledge—at least I trust, unblameable amusement, and improved, as I hope it may be in scientific hands, it may become the means of affording more strongly grounded conjectures on the subject, than those now before the public, -that of the truly great Herschel, not being entirely free from objections. By this apparatus, without the least straining of the eye, the image of the sun's disc may be leisurely examined, on which I have frequently seen,—not only the spots, but also what appear to be hills and vallies all over its surface, and also long ridges of shining matter much brighter than the general face of the sun. By this apparatus, the size of the spots may be measured with ease, I do not say with mathematical accuracy, but in round numbers the method of doing this is the following:—

I reduce the sun's image on the screen (see diagram Plate 3, fig. 1,) to 21 inches diameter, with a pair of compasses, I take the length of the spot or spots, suppose they measure 7-10ths of an inch, then, as 21 inches are to 880,000 miles the diameter of the disk, (in round numbers) so are 7-10ths of an inch to 25,600 miles, the space occupied by the spot or spots.

The apparatus consists of a Dollond's two-feet six inches, achromatic telescope, with a magnifying power of about 40, having rack work to give a vertical and horizontal motion; this is fixed to, and projects through a door into a darkened room, having a south aspect, and is set to the latitude of the place.

a, is the door; *b*, the telescope; in the centre of the door is an aperture about 12 inches square, round which is nailed a piece of black cotton cloth *c*, this is tied round the telescope outside the door to prevent the light from entering the room, and affords space for the telescope to work freely; *d*, is a screen of very fine grained white paper about 30 inches square, supported on a stand, having rack work to elevate or depress it, and also to place it perpendicular to the telescope, so that, when the image of the sun is thrown upon it through the telescope, it may be perfectly circular.

Perhaps a concise statement of some of the most prominent opinions on the subject, may not be unacceptable to your readers. Gallileo was the first person who discovered the spots on the sun in 1610, he seemed to think them matters floating on the surface. Doctor Derham supposed them volcanos.

Doctor Franklin supposed them to consist of portions of sulphur thrown up into the sun's atmosphere by the action of fire, and when removed from its influence, it congregated into masses too heavy to float longer, and sinking to the body of the sun, again became subject to the action of fire.

Doctor Wilson of Glasgow was of opinion that the dark part of the spots are cavities in the sun's atmosphere, and that the less dark appearances which surround the dark part are the shelving or sloping sides of the cavity.

M. de la Lande, in 1776, was of opinion that the darkest part of the spots, are bodies of rocks projecting above the general luminous surface, which rocks are laid bare by the flux and re-flux of the luminous matter which surrounds the sun, and that the lighter parts of the spots, are only parts of the same body of rocks partially covered with the luminous matter.

Doctor Herschel's opinion is, that the sun is a habitable globe, surrounded with *two* atmospheres, the outermost consisting of bright empyreal luminous, or phosphoric clouds, the innermost, of clouds much less luminous, that the dark parts of the spots, which he calls *openings*, are portions of the solid body of the sun laid bare, the lighter parts he calls shallows, to account for these openings. Doctor Herschel presumed that there exists a transparent elastic gas, which forces its way through the lower atmosphere, mixes with the gases in the higher regions, and thus promotes the increase, and assists in maintaining the general luminous phenomena. Shallows he thinks are level depressions of the luminous clouds, which surround the openings.

It appears, therefore, that Doctor Herschel and Doctor Wilson do not differ materially as to the spots; the latter Gentleman has given in the Philosophical Transactions, the method of measuring the shelving or sloping sides of spots, one of which he measured in November 1769, and found it four thousand miles in depth; it is therefore presumable upon his hypothesis, that the luminous matter surrounding the sun is in depth 4,000 miles.

Persons who like myself have dabbled in these matters, cannot but have formed some opinion on the subject--should such opinion however differ from the high authority of Doctor Herschel, would it not be chastiseable presumption to publish it.

Should this paper be the means of drawing the attention of your scientific friends to this subject, my object will be fully accomplished.

I am, Gentlemen,

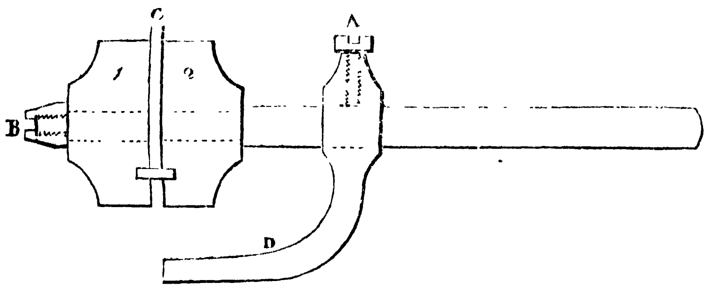
Your obedient Servant,

KNIGHT SPENCER.

West Brixton,
April 7th, 1828.

ART. VIII.—DESCRIPTION OF A NEW SAW-SET, INVENTED BY MR. FRYER.

GENTLEMEN.—Should the following description of a saw-set invented by me about fourteen years since, and which I have found by experience fully to answer the purpose for which it was intended, be thought worth a place in your valuable publication, it is quite at your service.



It is used in the same way as the common saw-set, the handle runs through the two cheeks 1 and 2, as shewn by the dotted lines. The cheeks and stops are made to take off at pleasure; it is regulated and fixed to suit the setting of any saw more or less by loosening the screw A, and the nut B, and moving the stop C, higher or lower, and the stop D, nearer or farther from the saw against which it acts. There should be two or more stops to suit the thickness of sash and hand saws. The edges of the cheeks vary to suit the different saws, and the stops may be reversed.

I think it must appear evident, that a saw-set thus constructed, acting upon principles that cannot err, and by which, even an inexperienced person may set a saw better than is usually, or perhaps can be done by any saw-maker, must be of considerable importance, at least to every working mechanic, and interesting to most of your readers.

Yours, &c.

R. FRYER.

18, *Pitfield Street, Hoxton.*

ART. IX.—IMPROVED MODE OF CLEANSING FLUES. COMMUNICATED BY SAMUEL WOODS, ESQ. JUNR.

To the Editors of the London Journal of Arts and Sciences.

GENTLEMEN.—With peculiar satisfaction, I embrace the opportunity of calling the attention of the public, through the medium of your valuable pages, to the evils of a practice, most disgraceful to an enlightened nation, the employment of *little children*, often at the tender age of five or six years, in sweeping chimneys; and to the means by which it may be totally and effectually abolished.

Any person who takes the trouble to examine the condition of the poor chimney sweeps, will find that the initiation into the business of climbing chimneys, is a period of the greatest suffering. Exposed every morning at very early hours to all the inclemencies of the weather, with bare legs and feet, and only two or three slight garments to protect them, they are compelled to go from house to house, and ascend steep and rugged flues by supporting their weight on the back, knees and elbows, which from constant climbing, and from the acrid quality of the soot continually worked in, soon ulcerate and become deep wounds. Inflamed eyes, frequent liability to accidents from falls, and a fatal disease peculiar to themselves, called the chimney sweeps cancer, are also evils to which they are always subject. The filth, from which they are seldom cleansed, is most injurious to their health, the absence of opportunity for education, and the degraded light in which they are regarded, are most destructive to morality. Those who survive this multiplicity of evils (often crippled and maimed) when too big to continue in the occupation, are thrown upon the wide world, unfitted for any other employment, and only associated with by the very lowest grade of society. The consequence, as may naturally be anticipated, is, that they become the most abandoned characters, practising every species of depravity and vice. Without taking into consideration the hardships of their childhood, this alone is a sufficient reason for the abolition of the practice.

It has been frequently urged by those, who will not examine the question practically, that they see the little chimney sweeps on the first of May, looking as happy as possible, they have asked several if they were not happy, and the answer was in the affirmative. Are such persons aware of the fact, that if it ever comes to the knowledge of their masters, they have said they dislike the occupation, these poor little fellows are severely beaten and ill-used. To me the first of May brings feelings of a different cast. I lament to see little children, naturally the most lovely of beings, begrimed with mingled soot and tawdry paint, and joining in the rude dance, to the unmusical clattering of the brush and scraper, altogether looking more like the offspring of a barbarous and untutored nation, than that of *British* subjects.

To prove that chimneys may be more effectually cleansed by machinery than boys, I will now, proceed to describe the annexed engravings.

The machine is an improvement by Joseph Glass on the excellent invention of Mr. Smart. The brush (fig. 1,) is made of a round stock *a*, commonly alder, and pierced with small holes ; into which bunches, formed of strips of the best whale-bone, are inserted, and made fast by glue. These strips *b*, are 8 to 8½ inches in length, which makes the brush, including the stock, about 20 inches in diameter ; it therefore completely fills, and consequently effectually cleanses, the largest flues, which are never more than 14 inches square, and seldom more than

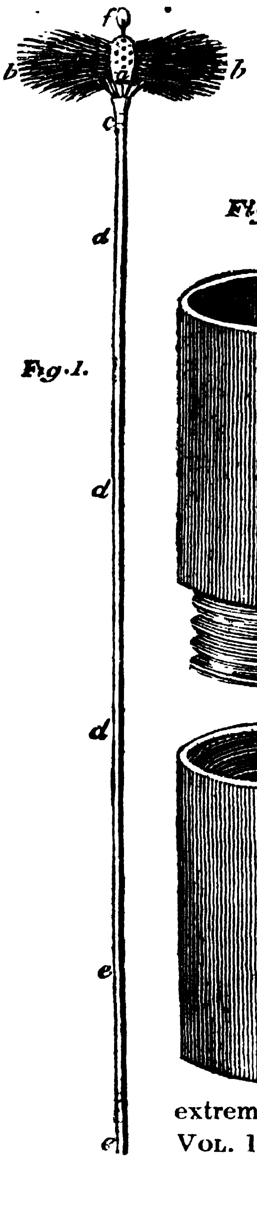
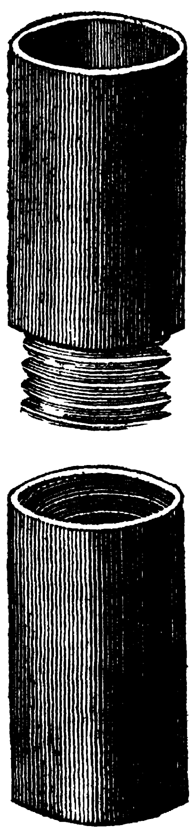


Fig. 1.

Fig. 2.



14 inches by 9. To make it pass more readily up the chimney, a small wheel *f*, is fixed to the top of the stock *a*. At the end of the stock *c*, is a very strong brass ferrule, with a wormed socket, which receives the screw of the first joint *d*.

Fig. 2, is a representation, in their actual size, of the ferrules. The three first portions *d*, *d*, *d*, 2½ feet in length, are made of good cane; the rest *e*, *e*, *e*, &c. of ground ash, and of the same length; the number used depending, of course, upon the height of the chimney; these gradually become stronger towards the bottom, and are affixed to each other, as the brush is forced higher up the chimney, by means of the brass screws and sockets, Fig. 2, before described.

The superiority of this machine consists in its extreme pliability, lightness, strength, and aptitude to turn by a little force applied at the bottom. It has been effectually used in crooked chimneys, were Smart's machine has not been able to pass. A machine has been made at Bath, somewhat on the same principle; the joints or portions, made of several slight canes twisted together, are, however fastened by a small iron screw, which has been found too weak: the whole machine is clumsy, and is so very pliable, that the force exerted below cannot drive it up the chimney. J. Glass, who is a bricklayer, a manufacturer of his machines, and a cleanser of chimneys by them, has given great satisfaction to those who have employed him. He sweeps the chimneys of the Excise, the King's New Palace, Lloyd's Coffee-House, part of those of Somerset House, and of several Insurance Offices, Banking Houses, &c.

He resides at No. 2, Moor Lane, Fore Street, Cripplegate; and is particularly recommended by the Society.

Fig. 3, is a cloth to fix over the fire-place, to prevent the falling soot from flying about the room. The joints of the machine are worked through the little sleeve in the middle.

Fig. 3.

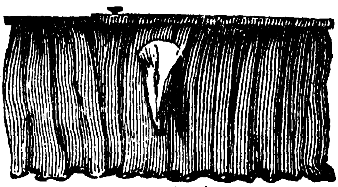


Fig. 4.

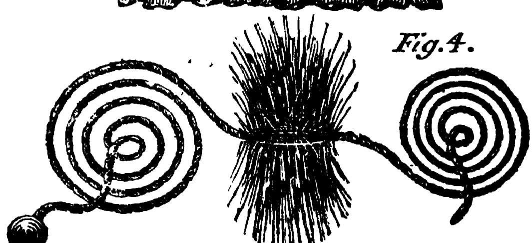


Fig. 4, is an apparatus called the Ball and Brush. An iron ball is attached to one end of a long rope, in the middle of which, is fastened a brush, very similar to the one in the cane machine. The ball is let down the chimney by a man at the top of the house, and received by another at the bottom; they work it up and down till the chimney is thoroughly cleansed. This apparatus is only used in very crooked flues which have no part quite horizontal. It is now nearly superseded by the introduction of the cane machine.

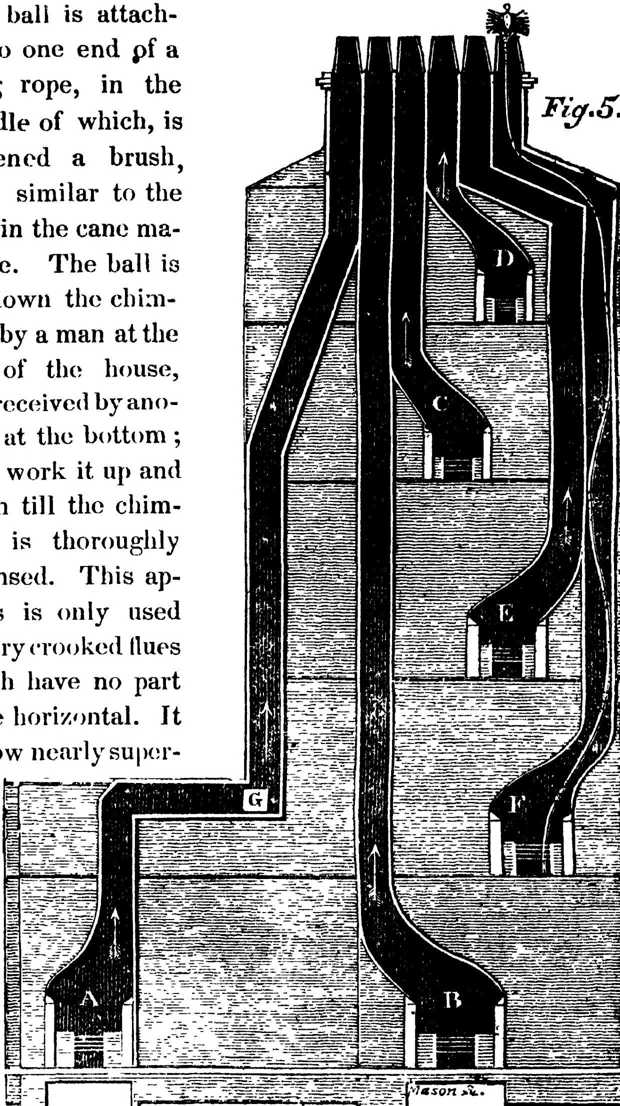


Fig. 5.

Fig. 5, is the end of a house, shewing the sections of flues in the different stories, as they are occasionally formed. A, is a flue with a horizontal part, which rarely occurs but which can only be adapted to a machine by the insertion of a small iron door at G, or by the removal of two bricks at that corner, when it is swept; either of which may be done at a trifling expense. The machine then works from G, to the top—from G, to the opposite corner of the horizontal part—and from the fire-place to the same. These are the flues which are very dangerous to the boys, and which are never well swept by *them*, unless there is an opening at G; for when a boy has swept all the upper part, there must be a great collection of soot at G; through which, when he descends, he is obliged to work his way by main force, at the imminent hazard of being suffocated. The quantity of soot that he can force along a horizontal part 30, 40, and even 60 feet long, and which is so small as not to admit of his turning himself round, must be very little indeed, in comparison to the quantity obtained from the perpendicular part.

B, C, and D, are flues of the common form, as they exist in 95 cases out of a hundred.

E, and F, are crooked flues, which have hitherto been cleansed by the ball and brush, but which may now be done by the cane-machine, which is represented in F. It is very desirable however that such flues should never be built.

The Cane Machine is recommended on account of its extreme pliability, and as being more durable; and though at first the most expensive, it will eventually be found the cheapest.

I have pleasure in being able to state that the Society for superseding Climbing Boys, is once more in active operation, the greatest obstacle, at present, to the success of their exertions appears to be want of funds.

I hope, that a benevolent public will support its efforts by pecuniary aid, as well as by never permitting Boys in their houses; and beg to acquaint you that Donations and subscriptions are received by the Treasurer, Wm. Tooke, esq. Gray's Inn; the Sub-Treasurer and Hon. Secretary, S. Wood, junior, esq. 8, George Yard, Lombard Street; the Collector, Mr. Paull, 2, Parliament Street; by Messrs. Hoare and Co. Fleet Street; and Messrs. Williams and Co. Birchin Lane. I am, Sir,

Yours, &c. S. W.

Tottenham Green, 9th April, 1828.

ART. X.—ON THE FORMATION OF A NATIONAL REPOSITORY OF WORKS OF ART.

HAVING in our Journal for December noticed the exhibition of National Industry at Paris, which attracted so much attention in the autumn of last year, and enumerated the various honorary rewards bestowed by the French King upon the most perfect specimens of the Works of Art, we took occasion to ask " what would be the effect of such an exhibition in London?" That question appears to have been extensively discussed, and we have great pleasure in observing that some satisfactory issue is likely to result from our suggestion.

Dr. Brewster, in the last number of his Edinburgh Journal of Science takes up the question in these words: " The editor of the London Journal of Arts, from whose pages we take the preceding statement, asks, What would be the effect of such an exhibition in London? We extend the question by asking, What would be the effects of such an exhibition in London, Dublin, and Edinburgh? and we venture to answer it.

" The artists of France and of all foreign countries have, within the last ten years, not only been rivalling those of Great Britain, but in many points they have greatly surpassed them, and the consequence is, that Great Britain is rapidly sinking from the prominent position which it formerly held in the practical, and even in the scientific arts. This is owing to the neglect of the arts and sciences by every successive government by which we are ruled. The concerns of faction, and the urgencies of political, financial, and commercial transactions, occupy all the time and all the anxieties of our Ministers. No applications, however disinterested,—no remonstrances, however eloquent, can make the slightest impression in favour of science and the arts. Even those who devote their time and their money to introduce new arts and new materials of art, without any view to their own advantage, are checked and harrassed by the oppressive regulations of our excise laws, and our custom-house regulations, and are driven in utter despair from their patriotic position.

"In other countries no such obstructions exist. Public boards, whose objects are of a scientific nature, are there composed of scientific and practical men, whereas here scientific and practical men are entirely excluded; and the consequence of this is, that the concerns of these boards are conducted at a most inordinate expense, and all improvements, and all inventions, which are brought forward to promote their objects, are overlooked or rejected.

"To draw public atention to such a state of things,—to give to the useful and scientific arts the same fashion which the fine arts have so long enjoyed,—to collect from every corner of the island into its three metropolitan cities its unseen and its unhonoured inventions,—and to draw genius from its obscure retreats, would be a few of the effects of a biennial exhibition of British industry

The Society of Arts for Scotland has been struggling to accomplish this by their own means and exertions, but public aid and royal patronage are absolutely necessary to its success; and unless the plan is laid at the foot of the throne by some influential individuals, it will never be effected; and we must continue to brook the mortification, bitter as it is, of witnessing the triumphs of the arts in every land but the land which we love."

We shall at present refrain from making any further comment upon this subject, except to observe that the opinions expressed with so much warmth by our cotemporary are exactly those felt by ourselves, and we believe by every sincere friend to the British nation. Something is doing in this affair, and we wish it every success. From a variety of notices which have within these few days made their appearance in the public prints, we select the following:

"*National Repository.*—An admirable and most praiseworthy design is now being carried into effect, principally under the patronage and auspices of Mr. Agar Ellis, for the exhibition of National Productions in Arts, Mechanics, and Manufactures. Such an annual display has long been a source of wealth, honour, and emulation, in Paris, and we are sure it will have great effect in London. The upper part of the king's Mews at Charing Cross has been liberally assigned to the first exhibition; and workmen are busily employed in making the necessary preparations."—*Literary Gazette.*

What are the plans proposed for carrying these objects into effect, we at present know not, nor who are to be its principle patrons; but one thing we sincerely hope, that this infant project, which promises so much National benefit, will not be allowed to descend into the hands of a political faction, like several of the other *great doings* of the present day, which profess to promote knowledge and the arts, and to enlighten the multitude.

In our next we shall take further notice of this institution, and if possible, lay the plan proposed to be adopted, before our readers.

Recent Patents.

To LEMUEL WELLMAN WRIGHT, *of the Borough Road, in the County of Surrey, Engineer, for his Invention of certain Improvements in the Construction of Trucks or Carriages, applicable to useful purposes*—[Sealed 2nd August, 1826.]

THE subject of this patent is an improved truck or carriage upon wheels, having a platform or skid capable of being raised by means of levers, which under several modifications is designed to facilitate the transposition of casks and other heavy packages in warehouses, vaults, or other situations where they may require to be shifted from place to place, and piled one upon another, or taken down; and also for the purpose of lowering or raising such casks, or heavy packages from or into carts and waggons.

The several figures of trucks represented in Plate IV, exhibit different modifications of the invention, applicable to particular situations and circumstances.

The truck shewn at fig. 1, is expressly designed for riding or piling hogsheads one upon another, and is in the position for receiving the hogshead from a crane or waggon, the dotted lines exhibit the parts of the truck in their elevated positions with the hogshead raised, and about to be rolled off to its intended place in the pile.

The skid (which bears the hogshead) is raised by means of curved racks *a*, *a*, attached to the front parallel arms *b*, *b*, into the teeth of which racks, pinions *c*, *c*, (shewn by dots) work, and these pinions are put in motion by a lever, and click box *d*, attached to the middle of the pinion axle.

By raising the lever *d*, the click is made to force round the ratchet wheel, and this ratchet being affixed to the axle of the pinions, causes them to turn and to raise the racks and skid. A succession of strokes of the lever elevates the skid to its required height, and palls, dropping into the teeth of other ratchet wheels, affixed to the pinions, prevent the re-action of the axle and pinions.

After rolling off the hogshead, the skid is lowered by raising the handle *e*, to which chains are attached that withdraw the palls and click from their several ratchet wheels; and the axle being thus released, the parallel arms and the skid immediately descend into the position shewn in the figure.

A further modification of the foregoing contrivance is exhibited in fig. 2, which is a truck designed expressly for unriding sugar hogsheads, and other heavy packages. The figure represents a side view of the truck with the skid elevated, and a hogshead about to be taken down, which is called unriding. The dotted lines shew the same with the skid, and hogshead lowered ready to be wheeled away.

The truck being brought to the pile of hogsheads, the skid is elevated as shewn by means of the winch *d*, which turns two pullies *b*, *b*, and to each of these pullies a chain *c*, *c*, is affixed, and passed round the loose pullies *d*, *d*, the other ends of the chains being attached to the two front parallel arms or levers *e*, *e*.

It will be seen that by turning the winch *a*, and raising the handle or lever *g*, of the break *f*, that the chains will draw up the parallel arms *e*, and raise the skid as seen in the figure. The hogshead may now be drawn on to the skid by means of chains, secured to the skid, and passed round the hogshead, and attached at the reverse end to a barrel which is to be turned by rotatory arms *g*.

The skid with the hogshead upon it is retained in its elevated situation by the friction brake *f*, the friction strap of which is attached to the hinder axle, and in lowering the hogshead to the situation shewn by dots, the weighted lever *h*, must be raised by hand, when the parallel arms and skid carrying the hogshead will descend by their own gravity.

Figure 3, represents another modification of the improved truck designed for the purpose of stowing pipes or casks of wine, brandy, rum, &c. in vaults and warehouses. This figure shews a side view of the truck bearing a pipe of wine. The skid is raised by the lever or handle *a*, actuating the click box *b*, exactly in the manner described above. The angular levers *c*, *c*, which carry the skid *d*, are worked by chains *e*, *e* ; these chains are attached to large pullies on the spindle of the click box, and at their reverse ends are made fast to other large pullies fixed on the spindle *h*. To this spindle is also attached two small pullies with chains leading to the shorter arms of the angular levers *c*, *c*, and upon the same spindle *h*, there are also affixed two spur wheels *k*, *k*, taking into two corresponding spur wheels *l*, *l*, which likewise carries two other small pulleys similar to the former, and to the last mentioned pulleys chains are attached leading to the other pair of angular levers *c*.

The handle *a*, of this truck is worked in the same manner as that described in reference to fig. 1, which raises the load to the height, and into the position shewn by dots.

Fig. 4, is a horizontal view of the skid *d, d*, as attached to the truck in the last described figure, which is affixed to a circular plate *p*, and this plate with the skid turns round horizontaliy upon the platform *q, q*, into a convenient position for depositing the cask upon the heap in a latteral direction (as shewn by dots) at right angles to the position in which the truck stands. At the back end of the skid there is a windlass *r*, and pullies *s, s*, to which chains or ropes are to be attached for the purpose of drawing the casks on to the skid, or when the ropes are passed round the smaller pullies *t, t*, for drawing the casks off the skid, on to the pile. The arms of the skid may be extended as shewn by dots, by turning over upon their joints, for the purpose of allowing them to be introduced in confined situations between the casks. The sides of the skid may also be opened or expanded upon hinge joints at their back extremities, for the purpose of getting under the bilge of the cask when required, to be taken down from the pile.

The patentee proposes another modification in which a rotatory shaft with a right and left-handed screw moves two sliding boxes which draw the chains that raise the levers and skid, but as there may be several other mechanical modes of raising and lowering the skid or bed of the truck, on which the cask or other heavy body is placed, the patentee does not confine himself solely to those above described. [*Inrolled February*, 1827.]

To JOHN SNELSON SHENTON, *of Husbands Bosworth, in the County of Leicester, Plumber and Glazier, for his having Invented or found out certain Improvements in the Mechanism of Water Closets.*—[Sealed 12th July, 1827.]

THESE improvements in the mechanism of water-closets consists in the construction of an apparatus, or combination of mechanism, by which the valves of a water-closet are opened and closed by the act of a person sitting down upon, and rising up from the seat ; the improved mechanism therefore, constitutes what may be called, a self-cleansing water-closet, that is, the soil is let out of the basin after every time of using, and a sufficient quantity of fresh water is turned into the basin, and retained therein so as to constitute a stink trap, without the trouble of raising a handle or lever, as in the ordinary construction of water-closets; the particular advantage of which improvements is, that the closet cannot be left in a foul state, and the water retained in the lower part of the basin, prevents the passage of any effluvia from the air-trap below.

The manner in which this improved apparatus is constructed is shewn in Plate V., fig. 1 ; *a*, is the seat of the water-closet, the side being removed, for the purpose of exhibiting the mechanism beneath; *b*, is the basin, having a pan, dish, or valve at the bottom, of the ordinary construction; *c*, is the closet or vessel into which the soil is passed from the basin ; *d*, is the soil pipe, leading to the air trap; *e*, is a reservoir of water, shewn in section, which may be placed in any convenient situation above. The water passes from the reservoir through the service box *f*, and the pipe *g*, to the basin.

A person stepping upon the foot-board *h*, or sitting upon the seat *a*, will cause the right angle bar *i*, *i*, to be depressed, which bar *i*, being affixed to the seat and to the footboard, and connected by a joint to the shorter arm of the lever *k*, will, by its descent, raise the longer arm of the lever *k*, turning upon a fulcruum at 1, and effect the movements of the mechanism about to be described.

The rising of the longer arm of the lever *k*, lifts the bar *l*, which has a small catch lever *m*, joined to it, and the lower end of this catch lever, by the lifting of the bar *l*, is brought [illegible], and made to act upon the end or nose of the lever *n*, turning upon a fulcruum 2, which is a preparatory movement, for the purpose of opening the dish, pan, or valve at bottom of the basin, when the lever *k*, and bar *l*, descend again. This part of the mechanism is shewn detached upon a larger scale at fig. 2.

The first thing effected by the descent of the seat *a*, and foot board *h*, when a person sits or stands thereon, is to cause a supply of water to pass from the cistern or reservoir *e*, into the service box *f*; which is done by the following means. The bar *i*, descending with the seat and footboard, raises the longer arm of the lever *k*, as described, and this longer arm of the lever being connected by a chain to the end of the lever *o*, (mounted upon a fulcruum 3,) causes that end of the lever *o*, to be raised, and consequently the reverse end depressed, which draws down the rod or wire *p*, connected to it, and the top of this rod or wire being fastened to the longer arm of a lever *q*, mounted upon a fulcruum 4, above the cistern or reservoir *e*, the longer arm of that lever is depressed also.

Near the middle of the longer arm of the lever *q*, a chain or wire is attached, which suspends the valves *r*, and *s*, coupled together by links, within the service box *f*; by the descent, therefore, of the longer arm of the lever *q*, the valve *r*, falls, and by opening the upper aperture, allows the water to flow from the cistern into the service-box *f*; and at the same time the valve *s*, being permitted to rest upon the bottom part of the service box, closes the lower aperture, and prevents the water from escaping through the pipe *g*.

The water thus admitted into the service box *f*, flows also into the float box *t*, and consequently raises the float *u*, which is a hollow vessel. The float being connected by a wire or rod to a lever *w*, (turning upon a fulcruum 5,) as it rises, lifts the shorter arm of the lever *w*, also, and the longer arm of this lever, that is its reverse extremity having a rod or wire *x*, attached to it, and leading down to a lever *g*, below causes the lever *g*, which moves upon a fulcruum pin at 6, to be depressed by the rising of the float in the manner described.

The service box and float box being now full of water, the supply remains there ready to be passed through the pipe *g*, into the basin, for the purpose of cleansing it, which takes place when the person rises from the seat; all the parts of the mechanism remaining till then quiescent, and in the positions shewn by dots

On the person rising from the seat *a*, and stepping off the foot board *h*, the bent bar *i*, is immediately thrown up by the gravity of the weight at the end of the longer arm of the lever *k*. The lever *o*, is by that means allowed to assume its former position, and to raise the rod *p*, which permitting the longer arm of the lever *q*, to rise, causes the valves *r*, and *s*, to be drawn up; the former closing the upper aperture of the service box, and preventing any more water flowing into it from the cistern, while the valve *s*, being raised off its seat permits the water contained in the service box, and float box, to flow out through the pipe *g*, into the basin *b*. At the same time the desent of the longer arm of the lever *k*, brings down the bar *l*, and the lower end of the catch lever *m*, connected to this bar, pressing upon the nose of the lever *n*, (seen more evidently in the detached fig. 2) by the descent of the bar *l*, throws up the longer end of the lever *n*, as shewn by dots in fig. 2, for the purpose of opening the dish, pan, or valve at bottom of the basin, which lets down the soil into the box *c*, below. The dish at bottom of the basin is opened in the usual way by a crank *z*, connected to the longer arm of the lever *n*, and hence by the rising of that lever the dish or valve is opened.

In order that the dish or valve should not close instantly after discharging the soil, but remain open long enough for it, and the basin to be perfectly cleansed by the flowing of the fresh water, the float *u*, is employed. This float is raised in its chamber or box *t*, by the water, which flows from the cistern into the service box in the way above described, and when the water is allowed to pass away through the pipe *g*, the float *u*, descends gradually, by means of which the lever *y*, connected to it through the lever *w*, and rod *x*, as already explained, is made to rise, and a small friction roller mounted in this lever *y*, acting against the under side of the catch lever *m*, by the rising of the lever *y*, lifts the catch *m*, until its lower end slips off the nose of the lever *n*, and allows that lever to assume its former position, and the dish or valve at bottom of the basin to close, when the water continung for some short time longer to flow from the service box through the pipe *g*, into the basin, the lower part of the basin, and the dish becomes filled with water, which acts as a stink trap, and perfectly prevents any effluvia from passing from the pipe or vessel below into the apartment.

The patentee concludes by saying, though I have described fully the several parts of the mechanism of the improved water closet, yet I wish it to be understood that I do not claim every part of the said mechanism as new, or of my invention, I therefore desire it to be remembered, that the particular features of my invention are the bar *l*, the catch lever *m*, the float *u*, and the appendages to work the same however formed for the performance of the actions, and the accomplishment of the objects before stated. [*Inrolled September*, 1827.]

To ROBERT DAWS, *of Margaret Street, Cavendish Square, in the County of Middlesex, Upholsterer, for his Invention of certain Improvements on Chairs or Machines, calculated to increase ease and comfort.*—[Sealed 28th April, 1827.]

THE object of this invention is the construction of a chair or sofa for the use of invalids, the back and arms of which are so made as to be capable of having their positions shifted, in order to allow a person to sit or recline in any attitude that might be found most easy, agreeable, and condusive to their comfort.

The exact form or fashion of the chair or couch is of no importance, that shewn in Plate V, fig. 3, is a chair of the Grecian kind, and is exhibited merely for the purpose of explaining the proposed improvements.

The back of the chair is attached to the lower part by joints or hinges as at *a*, which enables it to recede in the manner shewn by dots. The arms of the chair are also attached to the back by joints or hinges as at *b*. The front supports of the arms are not fixed to the seat, but the lower parts of them are tenons or blocks *c*, let into mortice holes in the framing of the seat, in which they are enabled to slide. These last mentioned parts are shewn in the figure, by having cut away a portion of the side rail, by which so much of it is exhibited in section, as will explain the construction. The blocks and supports of the arms are prevented from rising out of the mortice holes by a confining pin passed through the lower part.

On the side of the mortice hole there is a small ratchet *d*, and a click or pall *e*, is inserted in the support of the arm, which click is intended to take into the ratchet. At the back of the click there is a small rod *f*, which passes through the wood work, and its extremity being pressed upon by the thumb of a person sitting in the chair, raises the click or pall out of the ratchet, and the click or pall being thus withdrawn from the teeth of the ratchet, the block *c*, is enabled to slide along the mortice to any desired extent, the arm receding by that means into the situation shewn by dots, and the back of the chair, at the same time falling into the reclining position.

Instead of the ratchet and click, a series of holes in the side rail may be made, and a corresponding hole in the block, with a pin to pass through in order to fix the arms, and the back in any required position. Another method of shifting the arm is by allowing one part of it to slide within another as a socket and plug; or a cord or chain passed over pullies to be turned by a winch instead of the ratchet and pall, and in several other ways in which the same may be effected. The patentee considers however that these modes will readily suggest themselves to any competent workmen, and therefore thinks it fully sufficient to have explained the principle of his invention by the above figure.

In sofas the ends are to be hinged to the seat, and the back to slide upon the back rail, with click and ratchets to fix it in any situation.

The specification concludes by saying, "I claim the construction of chairs, the inclination of the backs of which are regulated by sliding or moving arms, and retained in any position by clicks, catches, or pins, or other stops; and also other similar machines, the inclinations of the ends or arms of which are regulated by sliding backs as above said." [*Inrolled October*, 1827.]

To THOMAS DON, *of Lower James Street, Golden Square, in the Parish of St. James, in the City of Westminster, Mill-wright, and* ANDREW SMITH, *of Well Street, Oxford Street, in the Parish of St. Mary-le-bone, in the County of Middlesex, Builder, for their Invention and discovery of methods of making and constructing Shutters and Blinds of iron or steel, or any other metals or compositions thereof, and improved methods of constructing and fixing Shutters and Blinds of iron or steel, or any other metals or materials, and methods of uniting in shutters the double properties of Shutters and Blinds.* [Sealed 15th June, 1827.]

THESE improvements on shutters and blinds consist in forming such shutter and blind of metal instead ot wood, by inserting metallic plates of any required dimensions into metal frames suited to the form of the window to which they are to be fitted, and also in the modes of fitting the said shutters into grooved styles for the purpose of adapting them to windows, and in raising and lowering them in their grooves. Likewise in a method and apparatus for projecting parts of the said shutters, and parts of the styles forward, and converting them into sun blinds, and drawing them back again with their grooved styles, and sliding the said shutters into recesses, for the purpose of concealing them, which said improvements are particularly described and exhibited in the several figures referred to in Plate IV.

Fig. 3, represents the external appearance of the shutters when fitted to close the front of a shop window; fig. 4, is a vertical section of the shutters, and their frames; and fig. 5, is a horizontal section of the same; *a*, *a*, *a*, represent metal plates (iron is usually employed); *b*, *c*, *d*, are bars of metal, which are fixed round each one of the iron plates, and constitute frames for them, the plates being inserted in grooves in those frames.

The several shutters with their frames are intended to slide up and down in grooves in the side styles of the window.

At the lower part of the bottom shutter on each side a staple is affixed, to which cords or chains are attached, and passed over pullies at the top of the window, for the purpose of drawing up the shutter by a winch and axle; the lower shutter having projecting pieces or brackets *b*, which when raised lifts the two upper shutters, and by these means they are all drawn up, and closed into a recess behind the facia or entablature of the shop front, and remain perfectly concealed, and when the shutters are lowered, so as to close the window, they slide down each in its own groove of the styles, and lock together by dove-tail joints, the grooves in the stops being cut to the exact length, or furnished with stops at the points where the shutters are to rest.

Fig. 4, which is a section of the shutter, and of the window frame, shews the contrivance for throwing a part of the shutter and its style out, and converting it into a sun blind.

In this instance, portions of the styles of the windows in which the grooves are formed for the shutters to slide, are on each side made moveable upon joints *e*, opening in the direction of the dotted lines. There may be various methods devised of throwing out these shutters, but that which is most approved of, is shewn in this figure.

By turning the winch and ratchet *f*, the cord is wound upon the ratchet barrel, and the lower shutter drawn up. When the lower shutter has been thus raised a short distance sufficient to release the dove-tailed catch from the second shutter as in the figure, then the side frames or styles may be opened, and with the shutters thrown out, turning upon the hinge joints as shewn by dots, this is done by placing the winch on the axle of the ratchet *g*, which has a pinion upon it, and this pinion being turned by the winch draws down the rack bar *h*.

The upper end of the rack bar is connected to a rod, and this rod to a crank or sector *i*, which turns upon its fulcruum joint, the sector being affixed to the moveable style. It will hence be perceived, that the lowering of the rack bar in the manner described will cause the two upper portions of the shutter to be thrown out in the direction of the dotted lines, where the blind will remain, being held fast by the ratchet *g*. The other ratchet *f*, must now be turned by the winch, and the lower shuttle drawn up into the facia.

In some instances, it will be necessary to employ side or end blinds, which must be made of stuff, linen, cloth, or any other flexible material, and in that case, one end of the blind must be attached to that portion of the style, which contains the two shutters, and the other end to the conical roller *k*, or it may be connected to it by a cord passed over that, and a second conical roller. When the blind is drawn in, and the style brought to its perpendicular place on the side of the window, the conical rollers will be turned by the weighted cord *l*, and the flexible blind wound upon or round the conical rollers, in which situation the side blinds remain when out of use.

All this apparatus for working the blind may be enclosed in a shallow recess within the window, and completely hidden from observation.

In order to keep the shutters fast when closed, and prevent them from being opened, or raised on the outside, spring catch bolts are let into the styles above the lower shutter, or any other well known fastening may be employed, which will prevent the lower shutter from being raised, and consequently keep the other shutters properly fastened; and by introducing another catch at the bottom of the shutters, when they are raised up into the facia, they will be prevented from descending until this catch-bolt is removed. These catches may be withdrawn by pullies or handles on the inside.—[*Inrolled August*, 1827.]

To VALENTINE BARTHOLOMEW, *of Great Marlborough-Street, in the Parish of St. James's, Westminster, in the County of Middlesex, Gentleman, for his Invention of Improvements in Shades for Lamps, and other Lights.* [Sealed 21st December, 1826.]

THE patentee proposes to construct a lanthern of an octagon or any other eligible form, with ornamental framework, and panels of painted glass, or other transparent medium, which lanthern is to be put over the lighted lamp, and the subjects contained in the transparent panels by that means are illuminated. The frame-work of the lanthern is made to imitate a gothic building, the transparent panels representing windows.

Over the burner of the lamp, which may be of gas or oil of the Argand or any other construction, an arched wire is carried, having a point at top to support and suspend the lanthern, and the aperture in the upper part of the lanthern for ventilation, is covered by a fan, in the centre of which there is a small hollow, intended to bear upon the central point when the lanthern is placed over the lamp, and equally poised.

The heat of the lamp rising to the top of the lanthern, creates a current of air, which in its passage through the fan, turns the fan and the lanthern slowly round, upon the centre or supporting point, and thus by the rotation of the lanthern, the transparent subjects are successively brought into the view of a spectator.

We are not aware what particular feature of novelty appertains to this invention, nor what the patentee intends to claim as his invention, as lantherns with transparent printing have been in use for ages, and are commonly called Chinese lantherns. As to the rotatory motion produced by the heated air passing from the burner through the fan at top, that is a simple philosophical experiment which we have known for many years applied exactly in the same way.—[*Inrolled February*, 1827.]

To JOHN HAGUE, *of Cable Street, Wellclose Square, in the Parish of St. George in the East, in the County of Middlesex, Engineer, for his Invention of a New Method of working Cranes or Tilt Hammers.* [Sealed 30th August, 1827.]

THESE proposed novelties in working cranes, and tilt hammers, consist in the adaptation of an atmospheric engine, in which a piston is made to reciprocate within a cylinder, by the pressure of air on one side of the piston acting against a vacuum on its opposed side, the piston rod being connected to a crank, by means of which a rotatory motion is given to a series of toothed gear, instead of working the gear by manual labour or other power, as in the ordinary construction of cranes. The tilt hammer is raised by a similar kind of atmospheric engine, the piston rod being attached to the under part of the lever which carries the hammer.

Plate IV, fig. 5, exhibits a crane with the atmospheric engine attached to it; *a*, is the perpendicular post or standard mounted in a plate *b*, in which it turns round horizontally as other cranes do, the lower extremity of the post being set in a step; *c*, is the barrel upon which the suspending rope or chains is coiled as the heavy goods are drawn up.

The cylinder *d*, is mounted upon a bracket in front of the main post, and is attached by a pivot or axle to the bracket, for the purpose of being enabled to turn or vibrate in a vertical direction. A working piston is placed within the cylinder *d*, properly fitted with packing in the same way as the piston of a steam engine, and the piston rod *e*, extends for some length outwards, and is connected to a crank *f*.

An air pump is to be placed at some convenient distance from the crane, and worked by a steam engine, or other power by means of which the air is to be extracted from the tube *g*; a pipe *h*, leads from the tube *g*, and after passing downwards towards the foot of the crane, rises upward, and is connected to the valve box *i*, at the side of the cylinder. Through this pipe *h*, the air is withdrawn from the cylinder *d*, by means of the continued action of the air pump, and a vacuum being thus produced on one side of the piston, the atmospheric air, which passes through the valve box *i*, to the opposite side, drives the piston with considerable force.

In starting the engine, the valves in the box *i*, are required to be turned a few times, which may be done by a small handle, in order to open and shut the vacuum, and air passages; by which means the piston will be driven to and fro in the cylinder, alternately on either side of the piston, by the pressure of the air acting against the vacuum, and the extremity of the piston rod being connected to the crank, the force by which the piston is driven will be communicated to the crank, and by that means the crank shaft will be made to revolve, and to drive the train.

Upon the piston rod there is a slider moving up and down between two guide bars fixed to the cylinder, for the purpose of keeping the piston rod in the centre of the cylinder, as it slides in and out, and as the crank goes round, the cylinder will be made to vibrate vertically upon its axle or pivot, accommodating its position to the situation of the crank upon which it is required, to make a direct stroke.

The piston being thus put in motion, and the crank made to revolve, the vibrations of the cylinder caused by the rotation of the crank will open and shut the valves *i*, and consequently the ends of the cylinder will be alternately exhausted by the air pump, through the vacuum pipes, and at the same time the air admitted at the opposite end of the cylinder, will drive the piston forward into the vacuum, and produce the stroke which gives the required mechanical force.

The piston being put in action in the manner described, and the crank thus driven round, a pinion *k*, on the crank shaft, takes into a toothed-wheel *l*, and another pinion on the axle of the wheel *l*, drives the toothed wheel *m*, to the axle of which the drum or barrel *c*, is fixed, and by that means the draft chain or rope is wound up. Thus the working piston drives the train of toothed gear which works the crane, for the purpose of raising any heavy body, and the actions of the whole are regulated by a fly wheel on the crank axle.

When this crane is not required to be in operation, the small cock *n*, in the vacuum pipe must be closed, which cuts off the communication of the air pump with the cylinder of this engine, while other cranes situate in different parts of the warehouse or wharf, are worked in the same way by their connection with the vacuum tube *g*.

Fig. 6, represents the manner of working a tilt hammer; *a*, is the main post upon which the fulcrum of the hammer rests; *b*, is the lever; *c*, the hammer; *d*, the anvil; *e*, the atmospheric engine; *f*, a close vessel intended to be exhausted by means of a steam engine; *g*, is the vacuum pipe leading from the exhausted vessel to the cylinder of the atmospheric engine through the valve box *h*. A small handle, or some such contrivance is to be adapted to the valve *h*, for the purpose of alternately opening and shutting the apertures by which the exhausted vessel withdraws the air from the cylinder, before the piston and the atmospheric passage admits the air into the cylinder behind the piston.

By these means the tilt hammer is made to rise and fall; and when its operations are to be suspended, the connexion between the engine and the exhausted vessel may be closed by turning the cock *i*. The mode of constructing the tilt hammer may be varied from that shewn in the figure, the invention consisting solely in working a tilt hammer by an atmospheric engine as described.—[*Inrolled October* 1827.

To John Gregory Hancock, *of Birmingham, in the County of Warwick, Plate Bender and Canister Hinge Manufacturer, for his Invention of a New Elastic Rod, for Umbrellas, and other like purposes.*—[Sealed 21st December, 1826.]

These elastic rods are made from ozier twigs, cut to any convenient length, and the pith removed from the internal part of the ozier twig by an ordinary boring tool. When this has been done, a rod of steel is introduced into the hollow part of the twig for the purpose of giving it stability.

The external part of the ozier twig may be now scraped or plained down, and finished by painting and varnishing, and ferrules or shoulders may be attached to the rod as may be required, for the purposes of sticks, whips, or the stems of umbrellas, or any other purpose to which these rods may be applicable.

The patentee claims to be the first inventor and maker of rods formed in this way.—[*Inrolled January*, 1827.]

To William Lockyer, *of the City of Bath, Brush Maker, for his Invention of an Improvement in the Manufacture of Brushes of certain descriptions, and in the Manufacture of a Material or Materials, and the application thereof to the Manufacture of Brushes and other purposes.*—[Sealed 28th April, 1827.]

The proposed improvements apply to the manufacture of a particular description of brush employed by plasterers called a stock brush.

The patentee states, that he takes a piece of elm or other suitable wood, about a quarter of an inch thick, and ten inches wide, formed with a handle at the back, suited for a plasterer's brush. Into the front edge of this piece of wood he bores the required number of holes, about a quarter of an inch deep, and one-eighth of an inch diameter. The bristles are then tied up in small bunches, having previously dipped their stems in a cement in order to fix them tight.

The bunches of bristles being now stuck into the holes in the wooden stock, a strip of zinc, about three quarters of an inch wide, is nailed round the stock, half of its breadth resting on the wood, and the other half pressing upon the bristles.

By this mode of making stock brushes, they will not be so subject to splash when employed by plasterers for washing, as when constructed in the old way. The cement to be employed for fastening the bristles, is to be compounded of seven-eighths pitch, and one-eighth shell-lac, melted together over a slow fire.

The patentee claims the application of the improvement as described to the making of plasterer's stock brushes, whether this cement is employed or not.—[*Inrolled October*, 1827.]

To JOHN WHITING, *of Ipswich, in the County of Suffolk, Architect, for his Invention of certain Improvements in Window Sashes and Frames.* [Sealed 9th January, 1827.]

THE specification of this patent (without describing the objects proposed) states that the invention will be fully understood by the following drawings and description.

Plate V, fig. 7, is a plan or horizontal section of the window frame, and part of the sash. Fig. 8, a vertical section of the sash taken at the meeting bars; *a*, is the sash frame; *b*, *b*, two grooves for the sash weights to pass up and down; *c*, *c*, *c*, fillets secured to the sash frame; *d*, *d*, grooves in the fillets for the cords or sash lines to work in. The cords or lines work over pullies or wheels fixed in the sash frames near the top; *e*, are the sash stiles; *f*, metal sockets set in the sash stiles with eyes or tubes, in which the cords or lines work.

In fig. 8, *g*, *g*, are the meeting bars of the sashes; *h*, pieces of iron, bent at right angles, for the purpose of holding the meeting bars together, and excluding the air.

This explanation does not convey to us a very perfect notion of the invention, but such as it is we give it to our readers. [*Inrolled March*, 1827.]

To JAMES BARRON, *of Birmingham, in the County of Warwick, Brass Founder and Venetian Blind Maker, for his Invention of a combination of machinery, or apparatus for Feeding Fire with Fuel; which machinery or apparatus is applicable to other purposes.* [Sealed 24th July, 1826.]

THE mode of feeding fires, proposed by the patentee, and which we presume is principally intended for the furnaces of steam boilers, is effected in the following manner:—A long perpendicular iron tube is erected nearly over the furnace, which tube is divided into a series of compartments, one above another, by flaps or falling bottoms. On the side of the tube a number of boxes or triangular prism form trays are placed, opposite to the several compartments of the tube. These trays are suspended upon pivots in a frame, each of them filled with coals, and being nearly balanced upon their pivots, a small force acting on one side, will turn over each tray and empty the coal into the tube, whence it falls down upon an inclined shute at bottom, and slides into the furnace.

The particular intention of this arrangement of the coal boxes is to connect a clock movement to the apparatus, by means of which the several trays of coal may be emptied, at certain intervals apart, one after another, and thus the furnace fed with small quantities of fuel every few minutes until the contents of all the trays are discharged.

At the back of the trays there is a perpendicular sliding bar, which is suspended by a chain or cord, connected to a going clock; as the time proceeds, the clock draws up the perpendicular bar, which first taking hold of the lowest tray, turns it over on its pivots, and discharges the coal into the perpendicular tube. At the same time the flap or bottom of the compartment falls back upon its hinges, and the coals descend to the inclined shute or bottom, and slide into the furnace.

The click having drawn the perpendicular bar up a little higher, the second tray is now turned over, and its coals discharged down the tube as before, and so on, the perpendicular bar ascending and turning the trays over in succession, until they are all emptied.

The general arrangement and plan of this apparatus being understood, it is obvious that the particular details of the parts will admit of variation, as circumstances and situations shall render desirable.

But there is one more feature which must not be omitted. It is proposed to rake the grate of the furnace in order to clear its bars of dust and cinders at the time that the coals are discharged. This is done by the coals in their descent falling upon a plate which is mounted upon a lever, a toothed rake being attached to the reverse end of the lever. Thus the depression of the plate raises the rake, and causes its points to be protruded into the furnace at the under part of the bars, and consequently to rake the cinders into the ash-hole.—[*Inrolled January*, 1827.]

Review of Books.

A History of the Life and Voyages of Christopher Columbus. By WASHINGTON IRVING. 4 *vols.* 8-*vo. London, Murray*, 1828.

NOVELISTS may be amusing historians of national manners, but their writings seldom tend to illustrate the subjects of scientific literature. The name of Washington Irving prefixed to any work is, however, in itself, a sufficient earnest for liberal sentiments and graceful composition. Characters who lived and flourished nearly four centuries back, are brought to the mind's eye with a vividness of colouring, and an accuracy of portraiture, unequalled by any other trans-atlantic writer.

The value of Columbus's discoveries will be best illustrated by a reference to the state of geographical knowledge in the time of Xerif al Edrizi surnamed the Nubian, an eminent Arabian writer. "The ocean," he observes, "encircles the ultimate bounds of the inhabited earth, and all beyond it is unknown. No one has been able to verify any thing concerning it, on account of its difficult and perilous navigation, its great obscurity, its profound depth, and frequent tempests; through fear of its mighty fishes, and its haughty winds; yet there are many islands in it, some peopled, others uninhabited. There is no mariner who dares to enter into its deep waters, or if any have done so, they have merely kept along its coasts, fearful of departing from them. The waves of this ocean, although they roll as high as mountains, yet maintain themselves without breaking; for, if they broke, it would be impossible for ship to plough them."

It is generally admitted that Columbus supposed an open sea to interpose between Europe and Asia. Ptolemy, whose authority no scholar ventured to question, had divided the equator into twenty-four hours, of fifteen degrees each; and of these, fifteen hours were supposed to be known to the ancients, extending from Gibraltar or the Canaries, to the city of Phinæ, the eastern boundary of the known world. The Portuguese, by advancing to the Azores, had discovered one more, and therefore there remained eight hours, one-third of the globe yet unexplored; and how much of this was filled up with the undiscovered parts of Asia, who could tell? The length of a degree, too, had been supposed to be not more than fifty-six miles, which again lessened the intervening space. Then again, according to the narratives of Marco Paulo, and Sir John Mandeville, Cathay extended far beyond the boundaries of ancient knowledge, and islands, particularly Antille and Cipango, lay still beyond, so that, on the whole, the probability seemed to be, that either these islands, or the continent of Asia, were within 4,000 miles of the Portuguese coast. That lands really existed in the western direction, there were numerous indications; a pilot, for instance, sailing 450 leagues to the west of St. Vincents, had picked up a piece of carved wood, evidently not manufactured with an iron instrument. In Porto Santo, again, a similar piece of wood had been taken up, drifted from the same quarter. Reeds of an immense size had floated from the west, such as Columbus imagined had been described by Ptolemy as growing in India. At the Azores, again, trunks of immense pines had come ashore, and two dead bodies, with features differing from every known race of men. The probability, then, in the mind of Columbus, rose to certainty, that India was approachable in this direction, and of course, by a much shorter route than by circumnavigating Africa, supposing it indeed to be circumnavigable, which supposition, however, depended solely upon the reports of the ancient geographers, for no one had yet gone beyond the south of the equator.

With a belief thus fixed, he dwelt upon the thought, till he believed himself destined, and especially appointed by Providence, to open this western route to Asia, and he accordingly in the words of a cotemporary historian "moved heaven and earth to accomplish his destiny." John II. of Portugal, though himself not indisposed to adventures, was urged in vain; his counsel pronounced the scheme chimerical, though an under-hand attempt was made by certain influential persons to ascertain the truth of his story, and anticipate the glory, by dispatching vessels; which, however, effected nothing. Indignant at this treatment, Columbus appealed to Spain; but Spain was otherwise engaged as the Moors were to be driven from Granada; but at length, he overcame the difficulties which were opposed to him on all sides, after laying siege to the court for seven years. Isabella herself undertook to fit out three small vessels; and, stipulating for the appointment of viceroy over all the lands he should discover, and a share of the plunder, for such it must be termed, and the title of Admiral; all which was finally conceded in the year 1492, then in his 56th year; he sailed from the port of Palos.

After encountering the frequent resistance, and occasional mutinies of his crew, and when despair, if despair could ever find a seat in so sanguine a breast, had perhaps almost seized himself, he came suddenly upon the Bahamas, and made his first landing on what is now called Cat Island; and from thence, sailing along the northern coast of Cuba, onward to the west, he came to Hispaniola, where one of his vessels was wrecked, and another, commanded by Pinzon deserted him. Here, then, proposing to return to Spain for reinforcements, he built a fortress which he named La Navidad, uninterrupted by the natives. Every where indeed he found them gentle, confiding, easily conciliated, in a state of absolute nudity, the country beautiful and fertile, but wealth there was none. Small pieces of gold were seen on their persons, and with these they readily parted for toys; and observing the eagerness with which gold was seized, they made signs that there was abundance in the distant mountains. Thus much accomplished, and with this intelligence, Columbus lost no time in returning to Spain, leaving thirty-nine men at the fortress, with special directions to survey the Island, and collect all the gold in their power, hoping, as he said, to find on his return, a ton of it, and that in three years, wealth enough would be obtained to conquer Jerusalem and the Holy Sepulchre.

Narrowly escaping shipwreck, and some treachery on the part of the Portuguese, he at length reached Spain, and was received with the very highest marks of distinction by his sovereigns, even to seating himself in their presence, and active preparations were forthwith made to start him afresh with augmented resources. Ferdinand's rapacity was now inflamed by Columbus's magnificent anticipations no less than the means of leading 50,000 foot, and 10,000 horse against the infidels. In the following spring, he set sail with a fleet of seventeen ships, and 1,500 men on board. The first land he made this time, was Dominica, from discovering it on a Sunday; and after cruizing some time among what are now termed the Windward Islands, he arrived at La Navidad, when he had the misery and mortification to find nothing but destruction, and not a soul left to tell the tale of their fate.

But the immediate cause of the great Admiral's r verses, was the disorder and confusion in which he found on his landing at Hispaniola, in his third voyage, the affairs of that island had fallen during his absence, under his brother's administration.

His brother Bartholomew, being left in command, Roldan who was also a *protégé* of the Admiral's, disputed his authority. The consequence of this and other cabals, was the ruin of the prosperity of the colony, the suspension of the mines, and the extinction of the hopes of unbounded wealth. The horrors of famine followed close upon those of war. Nor was the presence of the admiral able to do do much; he issued proclamations, and did all in his power to enforce order and obedience, and was at last obliged to accommodate with Roldan on his own terms. Other mutinies of officers, and revolts of the natives, followed thick upon each other, while some, who had been expelled from the colony, returned to Spain, and made the most outrageous mis-representations of his conduct to the court, and the King, indiscreetly, to say the least, commissioned Bobadilla to go to St. Domingo, and inquire, and moreover, empowered him, if he found the admiral guilty of crimes, or extraordinary imprudence, to supersede, and send him home. Of course, Bobadilla's first step was, not to enquire, but to supersede, and, without further ceremony, he threw Columbus in chains, and dispatched him to Spain.

Ferdinand and Isabella, however, hastened to make reparation to Columbus for the shameful indignity to which he had so unworthily, and so contrary to their intentions, been subjected. Bobadilla was immediately recalled, and the admiral was restored to all his honours, and emoluments, except the viceroyalty of the Indies. But in thus withholding the restitution of the absolute authority over the newly-discovered countries, for which

Columbus had originally stipulated, Ferdinand was assuredly guilty of a gross breach of contract. Far too great as were the powers claimed by Columbus, to be delegated with safety to any subject, they had not the less been deliberately conceded to his demands in the outset; and though political expediency has often been pleaded with less weighty excuse, for the violation of treaties, the chicanery of Ferdinand in this transaction, so consonant with his wily and perfidious character, must be condemned upon every true principle of morality and honour.

Our limits will not, however, permit of further analysis, but one thing appears certain, that much of the failure that attended the various expeditions of this distinguished navigator, arose from an over-weaning desire to possess unbounded authority. He was peremptory on points that he could not demonstrate. Neither had he taken a due measure of his crew and agents. He looked upon them as machines, and they regarded themselves, incurring such risks as they did, as fellow-adventurers and companions. His right of enslaving his fellow-men, a subject that appeared to the navigator as plain as the sun at noonday, would now also be much canvassed. Indeed, the christian precept of all men being brothers whatever their complexion or geographical situation, was held by him as a doctrine fit only for priests, and monkish advocates of liberalism. But we must close our remarks, by recommending the author, in his next edition, to reduce his present voluminous work to half the number of volumes, as it will materially increase both its interest and value.

Introduction to the Science of the Pulse, applied as to the Practice of Medicine. By JULIUS RUCCO, M. D. *&c. &c. 2-vols. royal 8vo. London.*

MAN is, indeed, fearfully and wonderfully formed, and this truth is in no shape better illustrated than by a reference to the pulse. The natural Philosopher is enabled to construct a series of mechanical arrangements, for the use of hydraulic machines, which bear a mimic resemblance to this elaborate part of the human frame, but how far are they behind the series of valvular communications, which serve to convey the sanguinous fluid, for the pulse consists of a series of successive dilatations, and contractions of the arteries, in consequence of the successive impulses given to the blood through them by the repeated contractions of the heart.

It is not above a century since the pulse was first counted, or a standard of its natural frequency accurately established. Sir John Floyer appears to have been the first who applied a portable instrument to the purpose under the name of the pulse glass.

With respect to the natural standard, to which the comparative terms *quick* and *slow* must be referred, there has indeed been considerable difference in the statements of different physicians. The average number of the pulsations in an adult man in good health, between thirty and forty years of age, is estimated at about seventy three in a minute; but the pulse of women of the same age and condition is somewhat quicker. Kepler, who estimated the mean pulses of man at seventy in a minute, estimated those of women at eighty, or at one-seventh more; and Dr. Falconer considers the difference to be in about the same proportion, calculating the ordinary pulse of men at seventy-five, and that of women at eighty-four. Dr. Bryan Robinson has given a table of pulses according to stature, taking six feet as the standard, at which height he found the pulse to be sixty-five, and computing upon this rule, which he says was founded upon a great number of observations, that the mean pulses of well-proportioned bodies were to one another inversely, as the biquadrate roots of the cubes of the lengths of the bodies. Senac held a similar opinion, but his computation was somewhat different. He states the following proportions, namely, at two feet, pulse ninety; at four feet, pulse eighty; at five feet, pulse seventy; and at six feet, pulse sixty; the last number of which, he says, was deduced from observation of one hundred men of the Royal Guards, who were selected for that office on account of their tallness of stature.

Dr. Rucco's book of which it is impossible to furnish an adequate analysis, brings together every thing that has hitherto appeared on this important subject, and his extensive practice as a physician, has enabled him to verify by actual experience, the various physiological facts with which it abounds. So that the absurd theories and vague hypothesis with which the science of the pulse was originally encumbered, may now be considered as completely swept away. We need hardly add that so useful a work should find a place in every Medical library.

Novel Inventions.

Economical Mode of Boiling Water.

Most of our London readers have no doubt seen the blow-pipe apparatus, now employed for domestic uses. It is intended for the purpose of boiling small quantities of water, and the cost is about fifteen shillings. A more unphilosophical apparatus could hardly have been contrived. It is complex, while its complexity tends to destroy the material of which it is composed. A strong blast is impelled against the side of a vessel by a stream of alcohol, and the effect must, of necessity, be the speedy oxidation of the vessel itself.

The accompanying diagram serves to illustrate the form of an apparatus much more effective, and which may be purchased for one tenth of the money. It consists of a small metal vase, placed in a tray, and furnished with a little cotton wool for holding the pyroligneous ether, which may be advantageously substituted for alcohol. The cost of boiling a small vessel of water, will never exceed one farthing.

Ultra-marine.

It has been reported to the Académie des Sciences, that M. Tunel has discovered the means of making an artificial ultra-marine, which is finer and more brilliant than the natural; and which he can afford to sell at less than half the price of the natural. The process is a secret.

Pyroligneous Acid.

A tanner in Hungary uses with great advantage the pyroligneous acid in preserving skins from putrefaction, and in recovering them when attacked. They are deprived of none of their useful qualities if covered by means of a brush with the acid, which they absorb very readily.

Application of Windmills to Ships' Pumps.

The brig Hannah, Captain Bartlett of Plymouth, in her outward passage, having sprung a leak, it required 3000 strokes of the pump, per hour, to clear the water that was thus introduced; and had it not been for a windmill which had been previously attached to the pump by Cap.

tain Bartlett, the ship must have filled; as all the crew were completely exhausted with constant pumping, and were exposed to continuous gales for thirty-five days. When blowing fresh, the mill would make 2461 strokes of the pump per hour.

Method of obtaining the Figure of a Plant.

A piece of paper is to be rubbed over with powdered dragon's blood, in the manner practised by engravers, and then the small branch or leaf, of which the design is required, is to be laid upon it; by means of slight friction it soon takes up a small quantity of the powder, and being then laid upon moistened paper, an impression is to be taken in the manner practised for lithography, without a machine. This process may be usefully employed for preserving certain physiognomical and characteristic features, which cannot be retained by drying the plant.—*Bull. Univ.*

Magnificent Achromatic Telescope.

We have lately been informed by one of our scientific countrymen now in Paris, that M. Lerebours, an eminent French optician, has executed an achromatic telescope, with an aperture of twenty-four inches, and a focal length of twenty-five feet. The object-glass is made of M. Guinand's glass. The telescope cost about £1670, and the stand about £415, making in all about £2080. It has been now about three months in the Observatory, but no good opportunities for observing with it have occurred. Whether this grand instrument turn out well or ill, its execution does honour to the spirit and genius of the French nation, and to the monarch in whose reign it has been made.—*Brewster's Journal.*

Polytechnic and Scientific Intelligence.

London Literary and Scientific Institution.

THE new Theatre which has been recently erected by this institution in Aldersgate Street, for the accommodation of its members in attending Lectures on Science and Literature, was opened for the first time, on Friday evening, the 25th instant, when an inaugural address was delivered by Thomas Denman, Esq. *Common Serjeant of London.*

The company assembled on the occasion was extremely numerous, among whom we observed many gentlemen of the first respectability and consequence in the city: several members of parliament, and other well-known patrons of the Arts and Sciences.

The learned Serjeant commenced his address by complimenting his fellow citizens on the good taste which they had displayed, and their anxiety evinced for the cultivation of Literature and Science in raising this Institution within two years from its first formation, to the station of importance which it now assumed among other institutions of the metropolis. The meritorious efforts which were making to enlighten the working classes of society, imperiously called upon the more respectable order of citizens to push forward, and not suffer their heels to be trodden down by those who were following behind. The wealth and happiness of a nation always rose in proportion to her zeal in the cultivation of useful knowledge. The selfish individual who felt satisfied with his own ease, and cared not for the interest or happiness of his fellow-men, was a worthless clog upon society, for there was no man, whatever his station, but might be a useful member of the community.

The learned speaker took an extensive view of the many situations in civil and political society which the different individuals who heard him might be called to fill, from the guardian and protector of the parochial poor to the delegated representative of the people in the imperial parliament; and argued, with considerable eloquence, the advantages which would result to all classes from the liberal cultivation of knowledge, in civil and political economy, and in the useful arts.

The extensive establishment of the English language over the continent of North America, and our vast colonies, both in Asia and the West, had spread a taste for English literature and scientific enquiries, which it became the peculiar duty of the citizens of this metropolis to cultivate and promote.

It was in London that the brighter gems of British genius had been matured and ushered into light. The pathos and wit of our inimitable Shakespeare breathed forth its delightful effusions in this city: that brilliant star of philosophy—the immortal Newton, whose penetrating mind fathomed the utmost bounds of the visible creation, pursued his studies in this metropolis, and here discovered and developed the dark mysterious ways and laws of nature. The sublime Milton conceived and produced his celestial themes in a humble dwelling, which stood upon the very spot of ground on which this theatre has now been raised.

In a stream of eloquence which our limits will not allow us to pursue, the learned orator proceeded to enforce his arguments in behalf of the cultivation of Literature and Science in this metropolis, and particularly among the members of this institution, and concluded amidst the enthusiastic applause and admiration of the delighted audience.

In the course of the evening several interesting and highly gratifying speeches were delivered by Dr. Birkbeck, and other gentlemen, members and friends of the institution; after which, the secretary announced the order of lectures to be delivered, commencing on Wednesday, 30th instant.

On the Armature of Load-stones.

THE natural magnet or load-stone, has from time immemorial, justly attracted the attention of mankind, on account of the very remarkable and useful properties of which it is found naturally possessed. Strange, however, as at first view it may appear, no attempt has been made to ascertain by graphic delineation, the real arrangement of the poles in a mass of ferruginous matter. The importance of this will, however, be apparent in the armature of natural magnets, as the most singular anomalies have been found to arise from the employment of different load-stones, after the process of *armature* had been resorted to.

Kircher, in his book *De Magnete*, says, that the best way to arm a load-stone is to bore a hole through it, in which is to be placed a steel rod of a moderate length. This, he asserts, will take up more weight at the end than the stone itself, and Gassendis prescribes the same mode of arming. This is, certainly, a very valuable arrangement, but its intended object may be entirely marred by the accidental arrangement of its poles. This, however, will be better understood by reference to Fig. 2, Plate 3, in which it will be found, that the polar arrangement of the entire mass differs very materially from what we might have expected from the application of the compass to one point*.

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* The ingenious author of the above chart originally prepared its elaborate arrangement for the use of a learned Society, of which he is a member.

The various layers of which the magnetic mass is composed, have frequently a distinct series of poles, which tend to neutralize or destroy each other ; so that, it will frequently be found, that a cubical block of several pounds will raise less iron than a fragment from the same stone, of less than half the weight.

If then, we wish to arm a load-stone in the most perfect way, it will be necessary for us to make a series of observations, such as are shewn in the engraved chart, prior to commencing the process of armature, and then by properly arranging the steel plates, the best possible result may be obtained.

Fall of Rain.

SIX inches of rain fell at Geneva in the short space of three hours, on May 20th, 1827. From September 23d to 27th, there fell at Montpellier, fifteen inches eight lines of rain. In forty-eight hours, from the 24th to the 26th of that month, eleven inches ten lines of rain fell at M. Berard's manufactory, near Montpellier. The fall of rain at Joyeusse, (department de l'Ardrèche) was, according to the registers of M. Tardy de la Brossy, most extraordinary. The maximum of rain collected in any one day, for twenty-three years, was, on the 9th of August, 1807, as much as nine inches three lines: but on the 9th of October, 1827, there fell twenty-nine inches three lines of rain, in the space of twenty-two hours. Eleven days of that month, according to the same registers, gave thirty-six inches of water, or about double the quantity which fell at Paris during the whole year.—*Annales de Chimie.*

Luminous Appearance of the Sea.

MR. Finlayson, in his " Mission to Siam and Hue," has the following paragraph relative to the luminous appearance of the sea near Prince of Wales's Island:—

"Nothing is more singular in these seas than their phosphorescent appearance by night; the ocean shewing, like a vast lake of liquid fire, melted sulphur, or phosphorus. In many bays, such as the harbour at Prince of Wales Island, the bodies which emit this singular light exist in such vast quantity, that a boat may readily be distinguished at the distance of several miles, by the brilliant light, resembling that of a torch, proceeding from the water, agitated by her bow and oars. We have seen the sea rendered of a green colour and slimy appearance by day, so that it might have been mistaken for the green vegetable matter common on stagnant pools. We have taken up a quantity of this green-coloured water, and, by keeping it till night, have ascertained, that the green colour by day, and the phosphorescent appearance by night, were occasioned by the same substance.

"The causes of this luminous appearance in the sea are doubtless various in different parts of the ocean. We know that fish, when dead, afford a similar light; and experiments have shewn, that dead fish immersed in sea water, after a time, afford it also. The spawn of fishes is said to afford it, and putefraction is considered as a very common cause of this appearance. In the present instance, it appeared unequivocally to proceed from innumerable granular gelatinous bodies, about the size of a pin's head. These, when taken upon the hand moved about with great agility for a second or two, when they ceased to be luminous and remained immoveable."

Red Snow.

CAPTAIN PARRY, in his "Narrative of an attempt to reach the North Pole, in 1827," states, that on the 2d of

August, they met with red snow, of which the following account is given.

"In the course of this day's journey, we met with a quantity of snow, tinged, to the depth of several inches, with some red colouring matter, of which a portion was preserved in a bottle for future examination. This circumstance recalled to our recollection our having frequently before, in the course of this journey, remarked, that the loaded sledges, in passing over hard snow, left upon it a light rose-coloured tint, which, at the time, we attributed to the colouring matter being pressed out of the birch of which they were made; to day, however, we observed that the runners of the boats, and even our own footsteps, exhibited the same appearance; and, on watching it more narrowly afterwards, we found the same effect to be produced, in a greater or less degree, by heavy pressure, on almost all the ice over which we passed, though a magnifying glass could detect nothing to give it this tinge. The colour of the red snow which we bottled, and which only occurred on two or three spots, appeared somewhat different from this, being rather of a salmon than of a rose colour, but both were so striking as to be the subject of common remark.

Effect of the Aurora Borealis on the Magnetic Needle.

At a late sitting of the Académie des Sciences, M. Arago made several communications and statements, tending to confirm his opinions, (which have been controverted by Dr. Brewster and others), with respect to the effect on the magnetic needle produced by the Aurora Borealis, even when it is not visible on the spot, from not having passed the horizon.

Meteorological Prognostication observed in the Shetland Isles.

Mr. Scott, Professor at the Sandhurst College, states, that he has witnessed the following effect. It has been the custom to place drinking glasses in an inverted position upon a shelf in a cupboard on the ground floor of Belmont House. These glasses frequently produce spontaneous sounds similar to those which would be occasioned either by tapping them lightly with a pen-knife, or by raising them a little, and letting them fall upon the shelf. These sounds always indicated wind, and whenever they occurred, the boats and vessels were immediately placed in security. No indication was given of the quarter from which the wind would come, but the strength of the sound was always proportionate to that of the tempest. The latter came sooner or later, but generally several hours after the sounds. Mr. Scott states, that there was no sensible motion either in the glasses or their support, at the time when the sound was strongest, and he thinks that the cause of the phenomena may be electricity.—*Annales des Chimie.*

Fall of Aërolites.

It is stated in the St. Petersburgh Gazette, that a shower of aërolites fell near Belostok, on October the 8th, between nine and ten o'clock in the morning. The inhabitants were alarmed by an extraordinary noise which proceeded from a large black cloud that hung over their heads, and which continued for three, (some say six) minutes, resembling a running fire of musquetry. The noise, which was heard by several persons at the distance of more than ten miles, was succeeded immediately by a shower of stones, of which only four were picked up; the largest weighed four pounds, the smallest three quarters.

New Method of Preserving Crystals of Salts.

MR. DEUCHAR in a communication to the Wernerian Natural History Society, mentions, that crystals of efflorescent and deliquescent salts can be preserved from decay, if the air in the jars in which they are kept is impregnated with oil of turpentine. This is effected by pouring a very small quantity of the oil over the bottom of the jar.

General Science.

Royal Medal adjudged to Sir H. Davey.—The Royal Society of London has adjudged one of the royal medals to Sir H. Davy, for his method of protecting the copper of ships' bottoms.

Medal adjudged to M. Struve.—The Royal Society has adjudged a gold medal to M. Struve of Dorpat, for his observations on double und multiple stars.

Copley Medal adjudged to Dr. Prout.—The Royal Society has adjudged a Copley medal to Dr. Prout, for his mode of analysis of animal and vegetable substances.

Copley Medal adjudged to Lieut. Foster.—The Royal Society has adjudged a Copley medal to Lieut. Foster, for his observations on the magnetical needle, and the pendulum at Port Bowen.

Medal adjudged to Sir Thomas Brisbane.—The Astronomical society has adjudged one of their medals to Sir Thomas Brisbane, for his valuable astronomical observations made in New South Wales.

Keith Medal adjudged to Dr. Brewster.—The Royal Society of London has adjudged the Keith medal to Dr. Brewster, for his discovery of two new fluids in the cavities of certain minerals.

Diorama.

THIS unique display of the scenic art attracts daily crowded assemblages of the fashionable town. The subjects which have been recently opened for exhibition, are a portion of the ruined Cloister of St. Wandrille's Abbey in Normandy, and the entrance of the Village of Unterseen in Switzerland.

The talent displayed by the painter, in the former of the subjects, is, in our opinion, equal to any of his previous productions, that, however, does not appear to be the prevalent feeling; probably, because the extremes of light and shade are not so strongly depicted; a considerable portion of the scene being exposed to the unobstructed light of day. There are, however, parts of the picture which certainly have never been surpassed, if equalled. We allude particularly to the trembling of the leaves, pendant from, and clinging to, the mouldering ruins, which seem gently agitated by the passing breeze; and the sudden opening of a gate, creaking upon its rusty hinges, exhibits the warmth of sunshine upon the landscape without, in beautiful contrast to the chilly gloom of the venerable cloister within.

The village scene is beyond dispute one of the happiest productions of the scenic art; one may stand before the picture, and fancy the street extended in the view to be real, so extremely accurate is the perspective, and so strikingly natural the effects of light and shade, from the brightest sunshine in the foreground, diminishing gradually into the dimness of distance, where mountains rear their snow-topped heads. If there is any drawback upon the excellence of the picture, it is the want of boldness and colour in the sky, but certainly the artist merits the highest praise.

French Patents

DELIVERED IN OCTOBER, NOVEMBER AND DECEMBER, 1827.

To Souffrant, Barthelmi, mechanic, of Paris, for a pump, he calls a French pump to supersede steam engines. 15 years.

— Fastemain, Pierre Nicolas, of Sononches, for a machine to cut the corn in the field. 15 years.

— Bourrouse de Laffore, Joseph Bonaventure, of Agent, for a process to learn to read in a short time, he calls "Stateligie," 10 years.

— Bn. Cagniard de Latour, of Paris, for a process to apply the several sorts of "Lava," to purposes as yet unknown. 15 years.

— Capdeville, Charles Antoine, of Lugos, for improving cast iron by employing raw heath root. 10 years.

— Spiller, Joel and Crespel, Delisse, Louis Francois, Xavier Joseph, of Paris, for employing steam in the manufacture of beet-root sugar. 5 years.

— Cluesman, Jean Baptiste, of Paris, for a piano wherein the pins and dampers are different from other pianos. 5 years.

— Lepine, Jaques Nicolas, of Paris, for a portable gas apparatus. 10 years.

— Segundo of Paris, for improved horse bits, &c. 10 years.

— Petite pierre, Jean Henri, of Paris, for a metotachygraphique mould box to cast characters for music. 15 years.

— Aschermann and Perrin, Paris, for a cutting machine to shave the hair from hides for hat manufacturing. 10 years.

— Louis Junior, Francois, of Nimes, for improvements in the looms, " a la jaquart." 10 years.

— Lebarbey Pierre, of Paris, for a means to prevent and suspend ruptures. 10 years.

— Muirial Etienne, of Lyon, for woven stuffs imitating engravings, typographics. 10 years.

— Conrad, Philippe Henri, et Adhemar, Louis Joseph, of Paris, for a process to manufacture bricks. 10 years.

— Steininger, Francois, of Paris, for a mechanism principally applicable to the bass-viol. 5 years.

— Didot fils, Firmin, of Paris, for a process he calls lithotypographique to print with moveable letters. 5 years.

— Lorget, Albert Louis, of Paris, for a process to manufacture paper imitating enamel. 5 years.

— Leistenshneider, Ferdinand, of Poncey, for manufacturing paste board. 5 years.

— Bourquin, Abraham Henri and Company, of Lyon, for a mechanical weaver's shuttle. 5 years.

— Mallic Charles, et Memo, Fleuri, of Lyon, for a mechanical loom batt in weaving ribbands, &c. 5 years.

— Berthet, Claude and Cacheux, Victor, of Paris, for a clock escapement. 5 years.

— Beauvais, Francois, of Lyon, for a metallic composition he calls "argyroide" susceptible to the polish of steel. 5 years.

To Saint Maurice Cabang, of Paris, for a copying press, or secretary. 5 years.

— Rodier fils, Denis, of Nimes. for processes to give various workmanship to silk, wool, and cotton. 15 years.

— Mialle Simon, of Paris, for a method to teach to read in a few lessons. 15 years.

— Dumoutier, Bon Pierre, of Pantin, for manufacturing hydraulic lime. 15 years.

— Montagny, Jean Pierre, of Paris, for manufacturing buttons of all colours and dimensions imitating silk outtons. 5 years.

— Lepine, of Paris, for a horse collar and saddle. 5 years.

— Boutain, Charles Toussaint, of Paris, for double spectacles, he calls " binocle a tirage simultane." 5 years.

— Bridier, Royer of Sedan, for a malt-mill. 10 years.

— Croisat, Ferdinand, of Paris, for a hair brush. 5 years.

— Guilbout, Alexander and Boudot, Vincent, of Paris, for a system of machinery for roving and drawing silk, cotton, &c. 5 years.

—Gaulofret fils, Joseph, of Marseille, for a process to revive animal coal. 10 years.

— Arizolli, Barthelemi, Francois, of Paris, for cast iron chimneys. 15 years.

— Comte de Rochelines, Jean Baptiste Richard, and Fabricius Leonard, of Douai, for a mechanism to prevent the overthrowing of Coaches. 5 years.

— Bernardiere, Achille, for manufacturing fine baskets, &c. with whale bone. 5 years.

— Richard, Jean Jaques, of Paris, for manufacturing divers articles in cast iron instead of cast steel. 5 years.

— Collain, Jean Pierre, Francois, of Sabrian, for a serpentine chimney and fire-place in union with the boiler. 15 years.

— Irving of Paris, for apylying the atmospheric pressure and vacuum to produce a rotatory motion. 10 years.

— Boulet Jacques, of Paris, for a process to strengthen the carded and combed wool, &c. 15 years.

— Canson freres, of Annonay, for a process to glue the paper in the paste tub. 10 years.

— Simon Nicolas of Saint Die, for a portable kitchen-garden. 5 years.

— Prudel Pierre, of Carcassone, for a cloth shearing machine. 10 years.

— Siau Barthelemi Gaulofret fils, and Boffe freres Melchior Francois et Jean Baptiste, of Marseille, for a process to manuture glue from gelatine. 5 years.

— Becker, Henri Guillaume, of Strasbourg, for a new high pressure loco-motive steam engine. 10 years.

— Clement Desormes, of Paris, for a new construction of rooms destined to the manufacturing of sulphurique acide. 15 years.

— Migeon of Morvillars, for a machine to form the heads of wood-screws by heat. 10 years.

To Delacoux, of Paris, for an improved harp. 10 years.
— Choel nec Marie, Marquerite Leger, of Paris, for a method to cut out the edges of bobbin net. 5 years.
— Adam Jacques Francois, of Paris, for a moveable binding of books. 10 years.
— Bertaux Alexandre Murie, of Paris, for means to prevent the oversetting of carriages. 10 years.
— Thinat of Nantes, for a new high pressure steam engine. 10 years.
— Lamothe Jean, of Montreal, to make Bagliamy's distilling apparatus portable. 10 years.
— Strylosh William, of Lyon, for a process of manufacturing tallow candles imitating wax candles. 5 years.
— Beauduin Vramenne Servais Joseph, of Sedan, for a machine to prepare any material destined to the selvage of cloth. 10 years.
— Perkins Jacob, citoyen des Etats, Unis, for improvements in steam engines. 15 years.
— Becasse Pierre Victor, of Paris, for a carriage trigger with a moveable leaver. 5 years.
— Bernhard Antoine, of Berlin, for an apparatus to raise water or any other fluid only by the pressure of the atmosphere. 15 years.
— Galy-Cazalat, of Nancy, for an acrostatic lamp, and candlestick. 10 years.
— Chamboredon Louis Cesar, of Alais, for a mechanical power, he calls "conservateur des forces." 5 years.
— Wright Lemuel Wellman, of London, for a new improved crane. 15 years.
— Gourlier, Adrien Jean Baptiste, of Paris, for a boot iron, he calls "fer mobile cylindrique." 5 years.
— Petit pierre Jean Henri, for a machine he calls typomelographique for engraving music. 5 years.
— Boche and Aubin, for a gunpowder box measuring the charge. 5 years.
— Rolle Frederic et Schivilque Jean Baptiste, for a scale to weigh carriages. 10 years.
— Niogret Guillaume, of Paris, for a method of carrying passengers and goods without the power of horses, steam, &c. 10 years.
— Capy of Paris, for a coffee-pot. 5 years.
— Chamblant, Marie Nicolas Joseph, of Paris, for a new mechanical principle to convert the direct into a rotatory motion. 15 years.
— Viconite de Barres du Molard Jean Scipion Henri, of Paris, for a new systeme of bridges with expanded bearings. 15 years.
— Duclose Philippe Ignace, of Paris, for a girdle he calls "menouheene" to the use of females. 5 years.

To Bostock, James Bethune of London, for a system of machinery to manufacture metallic screws, commonly called, " wood screws." 15 years.

— Duguet fils, Antoine Nicolas, of Paris, for a machine he calls " petrin mechanique" for making bread. 15 years.

— Batilliat pierre of Macon, for a chymical substance to substitute for linen rags in the manufacture of paper. 10 years.

— Gervais of Paris, for a process to improve the manufacturing of wines, brandy, and other spirits. 10 years.

— Gibon Jacques Louis, of Paris, for new unalterable picture frames. 5 years.

— Poupon Claude, of Nuits, for a wine press. 5 years.

— Nuellens of Paris, for elastic matrasses, &c. 15 years.

— Arnett Thomas, of London, for an improved floating bed. 10 years.

— Perkins Jacob, citoyen des Etats, Unis, for additional improvement in steam engines. 15 years.

— Moitenier Antoine Prosper Marchand Auguste et Mazeline Jaques Francois, for a cloth shearing machine, called " velocifor. 5 years.

— Fusz Pierre, of Isming, for a mechanical coach trigger, to stop the wheels of carriages. 10 years.

— De laporte Pierre and Berthier, Jerome, for a process to manufacture metal thimbles. 5 years.

— Aschermann et Perrin, of Paris, for a blowing machine to cleanse the materials employed in the manufacturing of Hats. 10 years.

— Capelain, Jean Baptiste Claude, of Rouen, for a cloth shearing machine, he calls " a mouvement alternatiff. 5 years.

New Patents Sealed in 1828.

To Jane Bentley Lowrey, of Exeter, Straw Hat Manufacturer, for certain improvements in the manufactory of hats and bonnets.—Sealed, 25th March, six months for inrollment.

To Edward Cowper, of Clapham Road Place, in the parish of St. Mary, Lambeth, in the county of Surrey, gent. for certain improvements in cutting paper.—26th March, six months.

To Ferdinand de Fourville, of Piccadilly, in the county of Middlesex, Merchant, for certain improvements in Filtering Apparatus.—26th March, six months.

To Thomas Lawes, of the Strand, in the county of Middlesex, Lace Manufacturer, for improved thread, to be used in the manufacture of the article commonly called bobbin net lace.—29th March, six months.

To Henry Marriott, of Fleet Street, in the City of London, Ironmonger, and Augustus Siebe, of Princes Street Leicester Square, in the county of Middlesex, Machinists, for improvements in hydraulic machines.—29th March, six months.

To Peter Taylor, of Hollinwood, in the county of Lancaster, Flax Dresser, being one of the people called Quakers, for certain improvements in machinery, for hackling, dressing, or combing flax, hemp, tow, and other fibrous materials. 29th March, six months.

To John Davis, of Leman Street, Goodman's Fields, in the county of Middlesex, Sugar Refiner, for an improvement in boiling or evaporating solutions of sugar and other liquids.—29th March, six months.

To Charles Harsleben, of New Ormond Street, in the County of Middlesex, Esq. for certain improvements in machinery to be used in Navigation, chiefly applicable to the propelling of Ships, and other floating bodies, and which improvements are also applicable to other purposes.—3d April, six months.

To Lemuel Wellman Wright, of Mansfield Street, Borough Road, in the county of Surrey, Engineer, for improvements in the construction of wheel carriages, and in the machinery employed for propelling, drawing, or moving wheel carriages.—15th April, six months.

To John Gottlieb Ulrich, of Cornhill, in the city of London, Chronometer Maker, for improvements in Chronometers.—19th April, six months.

Meteorological Journal kept at the London Institution.

DATE.	TIME.	BAROM.	Thermometer. IN.	Thermometer. OUT.	WIND.	REMARKS.
MARCH 1	9	30·35	56	45·0	N. E.	Cloudy
	3	30·20	58	48·2	N. E.	Ditto
3	9	29·95	51	42·2	W. S. W.	Ditto
	3	29·95	53	45·6	W.	Ditto
4	9	30·00	52	43·2	N. W.	Cloudy, rn in theNight
	3	30·00	53	44·4	N. W.	Fine
5	9	29·90	51	38·4	W.	Ditto
	3	29·95	52	40·2	W. S. W.	Ditto
6	9	30·10	50	36·4	S. W.	Ditto
	3	30·05	51	39·8	S. by W.	Ditto
7	9	30·25	51	35·8	S. W.	Ditto
	3	30·20	53	39·2	S. by W.	Fine, rain in the even.
8	9	30·15	53	45·8	S. W.	Cloudy
	3	30·20	54	49·6	S. W.	Ditto
10	9	30·30	54	49·8	W.	Fine
	3	30·30	56	53·4	W. S W.	Ditto
11	9	30·30	53	45·8	S. W.	Ditto
	3	30·30	56	49·6	S. by W.	Ditto
12	9	30·15	55	47·4	S. W.	Ditto
	3	30·15	57	49·8	W. S. W.	Ditto
13	9	30·25	56	51·2	S. W.	Ditto
	3	30·35	60	57·8	S. by W.	Ditto
14	9	30·30	55	54·2	S. W.	Ditto
	3	30·30	58	58·4	S. W	Ditto
15	9	30.45	54	53·2	S. by W.	Ditto
	3	30·10	58	56·8	W. S. W.	Ditto
17	9	30·30	56	51·8	S. W.	Cloudy, rain in Night
	3	30·30	58	54·2	S. W.	Cloudy
18	9	30·30	56	49·8	N. W.	Fine
	3	30·20	57	50·4	N. W.	High Wind
19	9	29·50	55	46·2	W.	Ditto
	3	29,50	56	48·6	N. W.	Fine
20	9	29·40	54	45·4	S. W.	Cloudy
	3	29·40	56	47·2	S. W.	Rain
21	9	29·05	53	46·2	S.	Cloudy
	3	29.00	54	47·4	S.	Th. Ligt. Hail & Rain
22	9	29·40	52	42·4	W. S. W.	Fine
	3	29·40	54	45·8	S. W.	Rain
24	9	29·75	51	40·8	N	Fine
	3	29·75	52	43·2	N.	Hail, Rain
25	9	29 90	52	41·2	S.	Fine
		29·90	53	43·4	S. W.	Rain, Hail, &c.

In our last Meteorological Journal, the following *Errata* should be corrected.

January 5, *for* 22·70 *read* 29·70.
12, *for* 21·85 *read* 29·85.
23, *for* 33·35 *read* 30·35.
February 19, *for* 22·40 *read* 29·40.

Meteorological Journal kept at the London Institution.

DATE.	TIME.	BAROM.	Thermometer. IN.	Thermometer. OUT.	WIND.	REMARKS.
MARCH						
26	9	29·95	51	36·8	N E.	Fine
	3	29·90	53	41·4	N. by E.	Ditto
27	9	29·55	51	44·8	S. E.	Rain
	3	29·50	52	48·8	S. by E.	Fine
28	9	29·55	52	43·4	N. E.	Rain
	3	29·60	54	46·2	N. by E.	Cloudy
29	9	29·65	50	42·2	N.	Fine
	3	29·65	52	44·6	N. by E.	Ditto
31	9	30·35	51	39·8	N. E.	Ditto
	3	30·35	52	44·6	N. by E.	Ditto
AP. 1	9	30·35	48	39·8	N. E.	Ditto
	3	30·20	50	41·6	N. E.	Ditto
2	9	30·10	51	44·2	N. by E.	Ditto
	3	30·15	52	43·4	N. E.	Ditto
3	9	30·15	58	44·2	N. by W.	Ditto
	3	30·10	54	46·4	N.	Cloudy
4	9	30·10	53	42·1	N. E.	Ditto
	3	30·05	54	45·8	N. E.	Ditto
5	9	30·00	50	42·4	N. W.	Ditto
	3	30·05	51	45·8	N. W.	Ditto
7	9	29·50	52	44·6	E.—S. E.	Rain
	3	29·45	54	46·2	S. E.	Cloudy
8	9	29·40	51	43·4	S. E.	Ditto
	3	29·45	53	46·2	S. W.	Ditto
9	9	29·45	52	45·6	S. W.	Ditto
	3	29·45	51	48·2	S. W.	Fine
10	9	29·50	53	44·2	W.	Rain
	3	29·55	54	47·4	W.	Rain, Thunder
11	9	29·85	56	49·8	S. W.	Fine
	3					
12	9	29·70	57	54·2	S. W.	Cloudy
	3	29·70	59	56·4	S. W.	Ditto
14	9	29·85	55	51·2	S. W.	Ditto
	3	29·85	56	53·8	S. by W.	Cloudy, heavy rn. at 5
15	9	29·75	56	52·4	S. W.	Rain
	3	29·70	58	54·2	S W.	Rain, nearly all day
16	9	29·70	57	53·2	S. by W.	Cloudy
	3	29·55	59	54·8	S. W.	Rain
17	9	29·55	56	53·6	S. by W.	Cloudy
	3	29·55	59	55·4	S. W.	Ditto
18	9	29·60	57	52·6	S. W.	Rain
	3	29·60	58	55·8	S. W.	Ditto
19	9	29·60	58	51·8	S. W.	Ditto
	3	29·65	59	54·2	S. W.	Ditto
21	9	29·75	53	48·4	S. W.	Ditto
	3	29·75	55	52·4	S. W.	Cloudy, rn. in the even.
22	9	29·70	54	44·6	W.—S. W.	Ditto
	3	29·75	56	48·2	S. W.	Rain, Rain at 5.
23	9	29·85	53	50·4	S. W.	Cloudy
	3	29·85	56	52·6	S. W.	Fine
24	9	29·85	55	52·6	N. W.	Ditto
	3	29·90	59	57·8	W.—S. W.	Cloudy
25	9	29·95	56	54·2	S. W.	Cloudy, rn in morning.
	3	29·85	57	57·4	S. W.	Cloudy.

CELESTIAL PHENOMENA FOR MAY, 1828.

D.	H.	M.	S.	
1	0	0	0	☉ before the clock 3′ 5″
4	9	0	0	☿ in conj. with ο in Pisces.
5	0	0	0	☉ before the clock 3′ 31″
5	5	0	0	☾ in conj. with β in Capri.
6	0	0	0	♅ Stationary.
6	5	32	0	☾ in □ last quarter.
6	14	26	54	♃'s 1st Satt. will immerge.
8	8	55	30	♃'s 1st Satt. will immerge.
9	14	0	0	♄ in conj. with δ in Gemini.
10	0	0	0	☉ before the clock 3 51″
10	12	0	0	☾ in conj. with ε in Pisces.
10	17	0	0	☾ in conj. with ζ in Pisces.
12	9	0	0	☾ in conj. with ☿. Long. 9° 40′ in Aries. ☾ lat. 1° 17′ S ☿ lat. 1° 17′ S. dif. lat. o.
12	15	0	0	♀ in conj. with ε in Gemini.
13	9	50	0	Ecliptic Conj. or ● New Moon
14	8	0	0	☽ in conj. with 1 δ in Taurus.
14	8	0	0	☽ in conj. with 2 δ in Taurus.
14	10	0	0	☽ in conj. with ε in Taurus.
15	0	0	0	☉ before the clock 3′ 56″
15	10	49	48	♃'s 1st Satt. will immerge.
19	19	0	0	☽ in conj. with 1 α in Can.
19	20	0	0	☽ in conj. with 2 α in Can.
20	0	0	0	☉ before the clock 3′ 46″
20	15	34	0	☉ enters Gemini.
20	18	0	0	☽ in conj. with ο in Leo.
21	4	0	0	☽ in conj. with π in Leo.
21	11	11	0	☽ in □ first quarter.
22	12	0	0	☿ in conj. A in Taurus.
22	12	44	12	♃'s 1st satt will immerge.
23	6	0	0	☽ in conj. with ν in Leo.
24	17	0	0	☿ in conj. with 2 κ in Leo.
25	0	0	0	☉ before the clock 3′ 24″
26	11	0	0	☽ in conj. with λ in Virgo.
26	15	0	0	☽ in conj. with ♃. Long. 6½° in Libra. ☾ lat. 59′ 38″ N. Jup's lat. 1° 20 N. diff. lat. 20′ 22″
27	1	0	0	☽ in conj. with 2 α in Libra.
27	4	0	0	♀ in conj. with κ in Gemini.
27	19	0	0	☽ in conj. with 4 ζ in Libra.
28	3	0	0	☽ in conj. with ϑ in Libra
28	20	17	0	Ecliptic opposition, or ○ Full Moon.
30	0	0	0	♂ Stationary near ♆ in Sagitt
30	0	0	0	☉ before the clock 2′ 50″

☽ The Waxing Moon.—☾ The Waning Moon.

Rotherhithe J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR MARCH AND APRIL 1828.

1828.	Thermo.		Barometer.		Rain in inches.	1828.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low	
MAR.						APRIL					
26	49	24	29,82	29,73		11	54	36	29,70	29,66	,01
27	52	32	29,46	29,43	,025	12	56	45	29,60	29,56	,05
28	46	36	29,66	29,43	,025	13	58	47	29,53	29,46	,075
29	47	36	29,80	29,75	,075	14	56	38	29,73	29,66	
30	60	31	30,06	29,86	,025	15	57	41	29,72	29,58	,1
31	52	25	30,26	30,16		16	54	42	29,56	29,31	,2
APR. 1	50	25	30,22	30,10	,025	17	55	43	29,36	29,34	,125
2	48	32	30,00	29,96		18	50	45	29,36	29,30	,425
3	46	31	30,03	29,96		19	52	42	29,61	29,46	,525
4	47	31	29,89	29,86		20	50	43	29,77	29,76	,175
5	52	28	29,76	29,66		21	47	42	29,62	29,61	
6	48	35	29,53	29,52	,325	22	47	36	29,60	29,59	,05
7	48	35	29,40	29,29	,05	23	52	39	29,76	29,72	,2
8	49	35	29,36	29,20	,225	24	60	45	29,76	29,66	,05
9	45	39	29,39	29,22		25	58	46	29,83	29,66	
10	55	38	29,50	29,36	,05						

LOWER EDMONTON. CHARLES H. ADAMS

Lat. 51° 37′ 32″ N. Long. 3′ 51″ W. of Greenwich.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. III,

[SECOND SERIES.]

Original Communications.

ART. XI.—IMPROVED MODE OF SOFTENING AND HARDENING CAST STEEL DIES FOR STAMPING, COINING, &c. BY JOHN OLDHAM, ESQ. OF THE BANK OF IRELAND.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN.—The subject of hardening dies, and other steel tools, being one of very considerable importance connected with the mechanical arts, I am desirous of communicating, through the medium of your valuable Journal, the modes which I have adopted to effect that object, and the results of my experience as connected with that branch of the arts.

Annexed you have a rough sketch of my apparatus for the treatment of cast steel, (see Plate VI.) In this process I have gone through a great variety of experiments, as recommended by the most eminent practitioners in Great Britain, together with what occurred to myself from time to time, in order to remove the casualities constantly occurring in this hitherto uncertain process. First by the accident of burning it in the softening process, which often impoverishes the steel beyond recovery, and secondly, in scaling its surface by cracking, and even splitting the tools, and also in warping or twisting the materials, which in the operation of hardening sometimes renders them altogether useless.

I have found from repeated trials, the following principle of treatment never subjects me to any of those unpleasant disappointments.—Mr. Perkins recommends wrought iron filings, and I think this material fully as good, if not better than any other I have tried for softening Cast Steel, especially if it be made from soft Swedish iron purposely, so as to be perfectly free from all foreign matter.

The die or any other tool is to be covered about one inch thick in a sheet iron box, and this again put into a cast iron box one inch thick, with a thickness of sand covering all about one inch on every side as well as the top and bottom; the whole is then to be covered with a lay over lid and to remain from one to six (and in some cases twelve) hours, in proportion to the size of the tools and the degree of softness they are to be made to, not of course to be removed from the fire until all be quite cold. The fire is to be as strong as possible without being excited by draft or blast All this precaution I deem necessary to prevent burning the material which, as stated, nothing can recover that I know of.

When the die or other tool is to be hardened, I make carbon of new leather cuttings in the usual way in a close retort and immerse it while hot therein, taking care to keep it insulated in the sheet iron box covered with carbon to the depth of an inch: this box I put closely luted into a vertical muffle which I cover with a loose lid laid on, enveloping all in a clean coke fire [which never should be excited beyond the colour of sealing wax or red wafers] for such a length of time as the tool or die to be hardened may require.

On taking it out to be dipped for this purpose, I do not in the first instance use water from the consideration that the hot steel in decomposing the water extricates its oxygen and other gas, and which the former has such an affinity for as to destroy its surface; besides, water is a very rapid conducter of heat and too suddenly cools and contracts the outside of the tool, and the superior expansive power of the heat contained within the tool soon overpowers the cooling effect of the water, and consequently splits or warps the die or tool. Therefore I use olive oil, or which is still better napstha previously heated to 200 degrees. For either of those materials give out their carbon in the process of decomposition by heat, and of which they contain from 70 to 80 per cent. each. This material is more congenial to the character of steel and most essential to the hardening of it. Scarcely any gas is liberated and not being such a rapid conductor of heat as water alone, the steel will not, I find, crack or warp. In this, however, I only keep it immersed until the ebullition ceases occasioned by the immersion of the red hot steel therein, when I instantly take it out and dip it in an artificial spring of cold water where it is kept until completely cold.

By this mode of treatment the tools come out perfectly clean and as hard as it is possible to make cast steel perfectly free from cracks or flaws, and is never twisted or warped in the least.

Large tools or dies are very readily brought down in temper, if required, by being suspended in the muffle while red hot until brought to a straw colour; but, for any thing particular, especially for small tools, I prefer the same oil heated to 400 degrees and the tools left therein till cold.

I do, believe myself warranted in recommending the foregoing mode of treatment of cast steel tools or dies as being free from the vexatious disappointments that so often perplex and embarrass the artisan, to say nothing of the serious expence of loosing certain tools, and dies, upon which very great labour and expence has been bestowed.

Plate VI. figs 1 and 2, exhibit sections of my steel furnace *c*, *c*, are the sides and front made of cast metal. *d*, *d*, a jacket to prevent annoyance from heat, the vacant space between which and the furnace may be filled with some non-conducting material. *e*, *e*, are in holes in the sides. *i*, *i*, *i*, feet standing upon a basement made of blocks of fire stone or Stourbridge bricks, with a circular dish formed cast metal plate on the top thereof, with a hole in the middle for grate bars. *k*, *k*,—*m*, ,*m* is the ash pit fitted with a close door for cutting off the draft of air that way when necessary. The use of the dish is to form an ash lute to prevent air from having access that way. *f*, is the vertical muffle in both views. *g*, the inside cast iron box for receiving the die or tool; supported on *h*, the tripod—*o*, *o*, *o*, *o*, a wrought iron cradle composed of four arms for muffles to be suspended in, and hooked on the top edge of the furnace mouth.—*a*, *a*, sheet iron hood with door *b*, and chimney, *n*, *n*, &c.

By this plan of furnace, I can always command an uniform fire of equal temperature throughout; I think it may be occasionally essential, on particular occasions, to employ a damper in the chimney, which therefore may be added, though I never use one, opening the door *b*, I have found, answers quite as well.

Fig. 3, is the artificial spring,—*r*, an open vessel lined with lead, with waste pipe *t*. *p*, a double copper vessel standing therein, with inside bottom *q*, finely perforated with small holes; *s*, a pipe of sufficient bore, leading to an elevated reservoir, with cock and handle *u*, therein; *z*, a small cock to empty the fluid from the inside of *p*, into *r*, when required; the pipe *s*, is constantly open all the time that the steel is cooling.

These are the principle features of my process, and which having found more effective than any other mode that I know of, I have communicated to you for the benefit of your readers and the public in general, and remain,

Bank of Ireland, Your's, &c.
May 9th, 1828. JOHN OLDHAM.

ART. XII.—MR. SHUTTLEWORTH'S PRINTING PRESS.

WE have been favoured by the ingenious inventor of this press, with the following additional details tending to illustrate the construction and use of his improved printing press, represented in Plate 1, fig. 3, and described at page 11 of the present vol.

The Machine consists of three principal parts, the bed, the traversing frame, and the gearing, (for references see page 12.) The bed consists of an oblong table, on which is laid the inking slab, and the type, which latter is placed between the rollers.

The traversing frame is of considerable importance, as it contains the inking cylinder and the press roller, by the alternating motion of which, the impressions are taken off.

The gearing consists of a rack fixed to the traversing-frame, to which a reciprocating motion is communicated by the large wheel, which is formed of two planes screwed together, of different diameters, the teeth on the periphery of the largest of which impels the rack to the left, and those on the smaller of which, causing a small pinion interposed between it and the rack, to revolve when the teeth on the larger plane are out of gear, forces it back. It must also be observed, that during the periods of the several planes being out of gear with the rack, owing to the deficiency of teeth in different portions of the wheel, the traversing frame is at rest.

Let us now suppose the traversing frame to be pushed back to the extreme right, and the projecting teeth of the larger plane to be put in gear by turning the handle, by the motion of the rack to the left, as the wheel revolves, the press roller and cylinders will be drawn over the type, when these teeth being out of gear, the teeth of the smaller plane will, by communicating a rotatory motion to the pinion, (behind the right upright,) move back the rack sufficiently to allow the inking cylinders again to pass over the type, whilst the press roller is still to the left of the chase ; the vacuum space caused by the defalcation of the teeth now allows the frame to remain stationary, whilst the conducting drum and types being put n motion, (regulated by the occasional omission of teeth in the connected gearing,) draws in the paper over the type, sufficiently high to avoid coming in contact, till the drum stops, when the second row of teeth coming into use, forces the press roller over the chase, and the cylinders over the inking slab. By the second omission in the teeth, the frame rests whilst the drum again in motion carries out the paper, which, by the elasticity of the tapes, rises a little above the chase, after the roller leaves it, and delivers it out.

It will be seen, that at every revolution of the wheel, one side of a sheet is perfected, and the speed of the machine requiring, as near as can be calculated, something less than a moderate man's power, alone regulates the number of impressions.

Art. XIII.—On the Influence of the Moon on the Weather.

To the Editors of the London Journal of Arts, &c.

Gentlemen.—I need hardly inform you, that the weather, as denoting the state or disposition of the atmosphere, in regard to heat and cold, drought and moisture, fog, wind, rain, hail, snow, and other changes, is a sort of knowledge which is of vast utility to the public at large. Many persons, in this country, are surprised at the degree of perfection to which the ancients attained in this science; but it ought to be borne in mind, that the study of the weather in the countries occupied by them, such as Egypt, Greece, Italy, and the continent of Europe, is a very different field for observation from an island situated like England. If must be apparent, that it is easy to foretell weather in countries where months pass away without rain or clouds, and where for some weeks together, at stated periods, there are as certainly seasons of rain or snow. It may be asserted, with truth, that there is a greater variety of weather in London in one week, than in Rome, Moscow, or Petersburgh, in three months.

The influence of the moon on the weather has, in all ages, been believed by the generality of mankind, the same opinion was embraced by the ancient philosophers; and several of the most eminent of later times, have thought the opinion not unworthy of notice. Although the moon only acts, (as far at least, as we can ascertain,) on the waters of the ocean, by producing tides, it is, nevertheless highly probable, according to the observations of Lambert, Toaldo, and Cotte, that in consequence of the lunar influence, great variations do take place in the atmosphere and consequently in the weather. The following principles will shew the grounds and reasons for their embracing the received notions on this interesting topic.

There are ten situations in the moon's orbit, when she must particularly exert her influence on the atmosphere, and when, consequently, changes of the weather must readily take place. These are: 1, the new moon; 2, the full moon, when she exerts her influence in conjunction with, or in opposition to the sun; 3, and 4, the quadratures, or those aspects of the moon when she is 90°. distant from the sun, or when she is in the middle point of her orbit, between the points of conjunction and opposition, namely, in the first and third quarters; 5, the perigee; and 6, the apogee, or those points of the moon's orbit, in which she is at the least and greatest distance from the earth; 7, and 8, the two passages of the moon over the equator, of the first, which Toaldo calls the moon's ascending, and the other, the descending equinox, or the two lunisticees, as De Lande terms them; 9, the boreal lunistice, when the moon approaches, as near as she can, in each lunation, or period between one new moon and another to our zenith; 10, the austral lunistice, when she is at the greatest distance from our zenith, for the action of the moon varies greatly according to her obliquity.

With these ten points, Toaldo compared a table of 48 years observation, the result is, that the probabilities that the weather will change at a certain period of the moon, are in the following proportions. New moon, 6 to 1. First quarter, 5 to 2. Full moon, 5 to 2. Last quarter, 5 to 4. Perigee, 7 to 1. Apogee, 4 to 1. Ascending equinox, 13 to 4. Northern lunistice, 11 to 4. Descending equinox, 11 to 4. Southern lunistice, 3 to 1.

That the new moon will bring with it a change of weather, is, in the doctrine of chances, as 6 to 1. Each situation of the moon alters that state of the atmosphere which has been occasioned by the preceding one; and it seldom happens that any change in the weather takes place without a change in the lunar situations. These situations are combined on account of the inequality of their revolutions, and the greatest effect is produced by the union of the syzigies, or the conjunction and opposition of a planet with the sun, with the apsides or points in the orbits of planets, in which they are at the greatest and least distance from the sun or earth. The proportions of their powers to produce variations are as follow. New moon coinciding with the perigee, 33 to 1. Ditto with the apogee, 7 to 1. Full moon coinciding with the perigee, 10 to 1. Ditto with the apogee, 8 to 1. The combination of these situations generally occasions storms and tempests, and this perturbing power will always have the greater effect, the nearer these combined situations are to the moon's passage over the equator, particularly in the months of March and September. At the new and full moons in these months, and even at the solstices, especially the winter solstice, the atmosphere assumes a certain character, by which it is distinguished for three and sometimes six months. The new moons which produce no change in the weather, are those which happen at a distance from the apsides. As it is perfectly true that each situation of the moon alters that state of the atmosphere which has been produced by another, it is, however observed, that many situations of the moon are favourable to good, and others to bad weather.

The situations of the moon favourable to bad weather, are the perigee, new and full moon, passage of the equator, and the northern lunistice. Those belonging to the former, are the apogee, quadratures, and the southern lunistice. Changes of the weather seldom take place on the very days of the moon's situations, but either precede or follow them. It has been found by observation, that the changes effected by the lunar situations in the six winter months precede, and in the six summer months follow them.

Besides the lunar situations to which the above observations refer, attention must be paid also to the fourth day before new and full moon, which days are called *octants.* At these times the weather is inclined to change, and it may be easily seen, that this will follow at the next lunar situation. Virgil calls this fourth day, a very sure prophet. If on that day, the horns of the moon are clear and well defined, good weather may be expected; but if they are dull, and not clearly marked on the edges, it is a sign that bad weather will ensue. When the weather remains unchanged on the 4th, 5th, and 6th days of the moon, we may conjecture that it will continue so till full moon, even sometimes till the next new moon, and in that case, the lunar situations have only a very weak effect.

The following table constructed upon a philosophical consideration of the attraction of the sun and moon in their several positions respecting the earth, drawn up by the late celebrated Sir William Herschel, and confirmed by the experience of many years actual observation, will, without trouble, suggest to the observer what kind of weather will most probably follow the moon's entrance into any one of her quarters, and that, so near the truth, that in very few instances, it will be found to fail.

NEW OR FULL MOON.	SUMMER.	WINTER.
If it be new or full Moon, or the Moon enters into the first or last quarters at 12 at noon or between the hours of	Very Rainy.	Snow or Rain.
2 and 4 - - -	Changeable.	Fair and Mild.
4 and 6 - - -	Fair.	Fair.
6 and 8 - - -	Fair, if Wind North, West; Rain, if South, or South West.	Fair and Frosty if wind North or North East; Rain or Snow if South or West.
8 and 10 - - -	Ditto.	Ditto.
10 and midnight	Fair.	Fair and Frosty.
midnight and 2 - - -	Ditto.	Hard Frost, unless wind South west.
2 and 4 - - -	Cold, with frequent Showers	Snow and Stormy.
4 and 6 -	Rain.	Ditto.
6 and 8 - -	Wind and Rain.	Stormy.
8 and 10 - - -	Changeable.	Cold, Rain if Wind North, Snow if East.
10 and 12 at noon	Frequent Showers.	Cold with High Wind.

Hence, the nearer the time of the moon's entrance at full, and change, and quarters, is to midnight, (that is within two hours before and after midnight,) the more fair the weather is in the summer; but the nearer to noon, the less fair. Also the moon's entrance at full, change, and quarters, during six of the afternoon hours, viz., from 4 to 10, may be followed by fair weather, but this is mostly dependant on the wind. The same entrance during all the hours after midnight, except the two first, is unfavourable to fair weather, the like nearly may be observed in the winter.

HACKNEY, MAY, 1st, 1828. Yours, &c. J. D.

ART. XIV.—ON THE SILK WORM.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN.—Having some years ago been led in the course of business to reside for some time in the south of

France, and being intimately connected with silk reeling, my attention was attracted to several particulars in that branch of French national industry; among others, the following has always appeared to me to be well worthy the attention of men of Science. Every one who, whether in England or abroad, has ever bestowed the slightest attention on the silk worm either as a matter of curiosity or as a matter of business, must be well aware, that some of the cacoons are white and some yellow, but every one is not perhaps aware that yellow gum silk, reeled from the yellow cacoons, is strongly impregnated with an odour resembling that of violets, at the same time that white gum silk reeled from white cacoons, is perfectly free from odour of any description, I therefore beg leave to propose for solution the following question. "What is the reason of yellow gum silk being impregnated with an odour of violets, whereas white gum silk is free from that or any other odour?" Having proposed the question, I add the following particulars for the information of those who may be disposed to attempt the solution of it. 1st, the fact above stated is invariably found to exist in the south of France, even though the worms forming the different coloured cacoons may have sprung from the same parent stork, and even though they have been fed from the same tree; 2nd, the yellow gum silk is always specifically lighter than the white; and, 3rd, so strong is the odour of violets with which the yellow gum silk is impregnated, that a few pounds of yellow being confined for two or three days with several cwts. of white, shall suffice to impart a strong odour of violets to the whole mass, let both be exposed to the air, the white soon loses its acquired perfume, but the yellow retains it, and will continue to do so for ten or twelve months. In what I have stated above, I should wish to be understood, as confining myself strictly to

French silk, and that in the raw state before it has been submitted to the operation of throwing, whether the same peculiarity exists in the Greek, Chinese, and Indian silks, I have had no opportunities of judging, nor can I, not being perfectly acquainted with their system of reeling, form an opinion whether in that operation there may not be some extraneous matter employed, which might, even if the peculiarity above named did really exist, prevent its being noticed.

Should you deem the above question worthy a place in your Journal, I shall feel obliged by your insertion of it.

I remain, Gentlemen, Your obedient Servant,

London, May 7th, 1828. W. B. HONYMAN.

ART. XV.—A REPORT ON A PROCESS FOR SEASONING TIMBER; INVENTED BY JOHN STEPHEN LANGTON, ESQ*.

Mr. Langton having discovered a new method of seasoning timber, consisting in the removal of the greater part of the atmospheric pressure, and the application of artificial heat, by which the time necessary to season green timber, and render it fit for use, is only about twice as many weeks as the ordinary process requires years: he requests my opinion, first, on the influence this mode of seasoning may be expected to have on the wood; and secondly, on the practicability and advantages of the process on the large scale.

The ordinary mode of seasoning timber consists in evaporating the fluid matter, (called sap), by the natural

* We readily avail ourselves of Mr. Langton's permission to publish the annexed report, prefacing that our own opinion fully coincides with that expressed by Mr. Tredgold for the specification of Mr. Langton's patent, see Vol. XIV, page 17, of the first series of this Journal.

warmth of the atmosphere, with the precaution of screening the timber both from the direct action of the sun and wind, otherwise it cracks and receives much injury.

But seasoning, by the natural warmth of the atmosphere, proceeds slowly and irregularly, and much loss by decay takes place, unless the operation be conducted under the protection of a roof, to exclude rain and snow. Seasoning under cover is still a slow, though an expensive process, for at least three years should elapse from the time of felling the tree to that of its being used in such framing as is wanted in naval architecture, hence a stock of timber, equivalent to four years consumption, must be kept on hand, and three years consumption must be either under cover, or suffering still greater loss by exposure to the wet.

In the new process, the power of an air-pump is added, to draw the sap out of the interior of the wood, and the tendency of the fluid to the outside being thus increased, a higher temperature than that of the atmosphere can be applied, with less risk of causing the timber to split; consequently, the process may be completed in less time, and a few trials will show the best relation between the time and heat for the different kinds of wood.

Having briefly stated the process, I can with more clearness show the strong grounds on which my opinion is formed.

First, then, as to effect on the durability and strength of the wood. In the new process, as in the ordinary one, the sap is removed by evaporation; no solvent of the woody fibre is therefore introduced in either case, while the sap itself, being a fluid readily affected by temperature and other agents, it seems obvious that the sooner it is wholly removed from the wood, the better, provided the woody fibre contracts and solidifies without injury. That this may be done, is evident, from the specimens from which the sap has been extracted; they exceed the usual density of specimens equally dry, and have lost about the same weight in drying that is lost in the usual method, with a somewhat greater degree of shrinkage. The sap which is extracted is a nearly clear liquid, having a sweetish taste, with a very peculiar flavour, and a musty and disagreeable smell. The latter seems to proceed from a light, flocculent kind of matter, floating in the sap, affording the strongest evidence, that the sooner such matter is removed from timber, the better; and as it appears that the whole of this matter is removed by completing the process, I am of opinion the new mode of seasoning will render timber more durable than the common one, and it does not appear to be in any degree deteriorated in strength.

Secondly, the method is, undoubtedly, practicable on the large scale, and at an expense not exceeding ten shillings per load, with the advantage of setting free, at least half the capital required by the common method; the advantage of rendering the living tree available either for defence, convenience, or common use, in a few weeks after being felled, and in a state in which it may be trusted with safety; while, by the usual method, five years is not more than is necessary to be equally free of risk from shrinkage and decay. The usual practice is to use timber partially seasoned, in consequence of which the sap has to evaporate, and the wood shrinks, the joints open and the carpenter's skill in framing is rendered nugatory; for, as timbers shrink, frames change their form, and lose their strength, and ships and houses alike afford evidence of the fact, particularly ships sent out to warm climates.

It only remains to add, that, by the new method, the whole of the natural sap is extracted at once from the tree; it is known, by very simple means, when the whole has been extracted; the process requires only eight or ten weeks; it is more economical, and locks up less capital than the common method; and it contributes to the durability and soundness of timber framing.

THOMAS TREDGOLD.

Recent Patents.

To WILLIAM CHURCH, *of Birmingham, in the County of Warwick, Esq. for his Invention of certain Improvements in Printing.*—[Sealed 18th October, 1826.]

THE subjects embraced under this patent are intended as additions to the very ingenious machinery for printing, invented by Doctor Church some years back, particularly that machine for which a patent was granted in February 1824, and described in the tenth volume of the first Series of our Journal, page 169, and plate VIII.

The present improvements consist first in the introduction of a traversing sheet of calico or other fit material, to be employed in place of what is technically called the set off sheet with certain apparatus for the purpose of shifting it and preventing the effects of setting off in reiteration or perfecting the impression of the types upon a sheet of paper on both sides. Secondly, in a mode of sliding the bank or board upon which the sheets of paper are piled after printing, for the purpose of discharging the sheet from the taking off fingers. Thirdly, the construction and method of opening and closing the taking off fingers. And fourthly, the introduction of moveable bearers for supporting the ends of the inking rollers as they pass over the inequalities of the types set in the form.

Plate VI. Fig. 4, is a plan or horizontal view of the top of the platen and the bank shewing the situations of most of the improved parts, which are further exhibited in the following detached figures and partial views of the machine. Fig. 5, represents the platen, table, and form, as seen edgewise with the parts connected to the set-off sheet rollers—*a*, *a*, are two rollers affixed to revolving shafts *b*, *b*, to these rollers the two ends of a long piece of calico or other suitable material are attached, and the portion of calico extending from one roller to the other being passed under the platen is tightly distended, so as to produce an even surface extending over the form of types, which is to act as a set-off sheet.

In order to move this set-off sheet progressively forward, after every impression given, a catch takes hold of a ratchet wheel affixed on the shaft *b*, and draws the roller round a portion of a revolution in the manner about to be described; *c*, *c*, are the ratchet wheels affixed to the shafts *b*, *b*, one of which is to be acted upon by the catch *d*, after every impression.

As it is intended to work the set-off sheet backward and forward, that is to draw it off one roller, and wind it upon the other alternately, there is a contrivance by which when one of the catch *d*, is made to act upon its ratchet wheel, the other catch is withdrawn, consequently the sheet will be moved towards either end of the machine, according to which of the catches are placed in operation, and this setting of the catch is done by a simple hand adjustment. But as it is not wished to move the set-off sheet in printing the first side of the paper, the parts are so contrived that both the catches may be thrown out of action, and the set-off sheet allowed to remain stationary.

The mechanism when placed as shewn in fig. 5, is in this inactive state detached, but in fig. 6, which represents the operative parts, one of the catches is exhibited as taking into the teeth of the ratchet on the right hand; *e*, *e*, is a bent bar connected at each end to a tumbler *f*; and this bar is held fast in its situation by one of the notches near its centre, bearing on an angular stud *g*. A claw at each end of this bent bar supports and guides the arms of the catches *d*, *d*, and according to which of the notches of the bar *e*, is placed upon the bearing *g*, so will the catches be lowered into or raised out of the ratchets as shewn.

When it is intended that the set-off sheet shall traverse towards the right hand; then the bar *e*, must be shifted towards the right hand, and the left hand notch be brought into the angular stud *g*, fixed on the platen. This adjustment of the bent bar will place the right hand tumbler *f* in an enclined position as at Fig. 6, and bring down the catch *d*, into the right-hand ratchet wheel *c*, as shewn in that figure. The left-hand extremity of the spring bar will by this movement bring its tumbler into an erect position, which holds up the left-hand catch out of its ratchet wheel.

In order that the set-off sheet may be kept tightly distended under the platen while the right-hand catch and ratchet wheel are drawing it, the left-hand roller *a*, from which the sheet is now delivering, is held by a circular friction clip *t*, embracing a wheel affixed to the end of the roller. The chaps of this circular clip cross each other and are forced asunder by a double pallet, which by expanding the chaps brings the circular clip into close contact with the periphery of the wheel, and the friction ensuing necessarily impedes the rotation of the roller. When the set-off sheet is to be drawn the reverse way, then the bent bar *e*, must be shifted to the left-hand, the right-hand notch resting upon the angular stud *g*. The left-hand catch will now fall into the teeth of the left-hand ratchet wheel *c*; the right-hand catch being by the same movement raised up from the right-hand ratchet wheel, and the chaps of the circular clip on the right being now extended by the action of the pallet, the clip embraces and holds the right-hand plain wheel and its roller in the same way and for a similar purpose to that described in explaining the contrary movement of the set-off sheet; the left-hand clip at the same time releasing its hold, allows the left-hand roller to be drawn round by its catch acting in the teeth of its ratchet wheel.

In order to work this mechanism which draws the set-off sheet, sliding racks are introduced, shewn at *l*: which racks are connected to the rising and falling table *m*, *m*. The manner of moving this table and its form upwards and downwards being fully described in the specification of the former patent referred to above, is not explained in the present specification.

At the sides and under part of the table there are ears or lugs *n*, from which studs extend, and the lower parts of the rack bars *l*, being forked, take hold of these studs and the racks are consequently moved up and down by the rising and falling of the table. The sliding rack bars pass through mortices in the platen *o*, which racks take into toothed wheels *p*. These toothed wheels are intended to perform rather more than half a revolution upon their axles, and to receive a reciprocating motion from the racks as they ascend or descend.

A bent lever *q*, is attached by a joint to the angular stud *g*, (which is its fulcrum) and passing up through a slot in the bent bar *e*, is connected to the reciprocating wheel *p*, the junction of which acts as a crank.

By the connection of the parts last described, it will be seen that as the wheel *p*, moves round, the lever *q*, will be moved also; and this being attached to the catch arms at their junction, causes the catches to be sliden to and fro, and the ratchet wheel which is in connection, and its roller to be made to turn a portion of a revolution at every stroke.

Thus either of the catches being set in the manner described the rising and falling of the table will actuate the mechanism so as to cause the set-off sheet to be progressively drawn from off one roller on to the other roller, and by this means to shift the surface of the set-off sheet a little distance after every impression is given; and, when the entire roll or length of calico of which the set-off sheet is formed has been passed in one direction, then the bent bar *e*, is to be shifted as explained above, and the length of calico worked back again in a similar manner; and, in order to prevent as much as possible the same parts of the sheet coming again upon the same parts of the form of types at every change; the rollers *a*, *a*, are to be slidden a short distance in a lateral direction upon their axles or shafts *b*, *b*.

After bringing up the sheet of printed paper by means of fingers on to the bank or board, *w*, *w*, Fig. 4, upon which the sheets are to be piled as described in the former specification; and, having opened the fingers, it is desirable to slide the pile a short distance for the purpose of drawing the edge of the sheet from the fingers. To effect this object, there is a click *r*, attached to the back of the plain wheel upon the barrel of the reciprocating wheel *p*, which click drops into a notch in the periphery of a loose wheel that slides round upon the axle of the reciprocating wheel. In the side of this loose wheel, a crank pin *x*, is fixed, which acts between two guide pieces *y*, *y*, attached to the side of the bank frame *w*, *w*; and, hence by the reciprocating action of the wheel *p*, the click drives round the loose wheel half a revolution at every stroke, and causes the crank pin *x*, to move the bank or piling table to and fro, immediately after each sheet of paper has been laid upon the pile and the fingers opened.

It is to be observed that a similar contrivance is placed on each side of the bank which is worked as above said, by the rising and falling of the table.

The improved mode of constructing and of opening and closing, the taking off fingers will be seen by reference to the auxiliary detached figures 7 and 8. In the former specification, it will be seen that the taking off fingers are attached to bars which are conducted by endless chains passed over pulley wheels; in the present instance, the fingers are conducted by endless chains in a similar way, but attached to cylindrical rods *a*, one within the other; the lower finger is secured to the outer cylindrical rod, and the upper finger to the inner rod, and passing through slots with a spring coring them open. When the fingers are brought between the table and the platen, the pressure acting against the chaps of the locking piece *b*, forces them together, and a spring catch *c* passing through a slot, locks them securely and confines the edge of the sheet of paper between the fingers.

When the fingers have brought the sheet of paper on to the pile, they are opened by a leaf *d*, striking against a trigger *e*, which forces the catch back and allows the springs within to throw the fingers open. This part of the mechanism is worked by two small studs *f*, *f*, on the side of the rack bar *l*, which as the rack bar rises and falls in the operation above described; strikes the lever *g*, up and down, and moves the rod which carries the leaf *d*, and causes the leaf to vibrate and to strike against the trigger *e*, at the time that the fingers are to be opened.

The bearers which support the ends of the inking rollers shewn at *t*, *t*, in Fig. 5, hang upon springs and are made to rise and fall. When the table *m*, with the form is up giving the impression, the bearers are below it, as shewn in Fig. 5, free from the sheet of paper; but as the table *m*, descends previously to the inking rollers passing over the type; the pieces *v*, *v*, affixed to the frame of the machine, catch the ends of the bearers and keep them up level with the surface of the type. On the rising of the table, again they descend into the situation shewn. The patentee says, "I have described this improvement as particularly designed to be adapted to the printing press as set forth in my specification above alluded to; but, I wish, also, to be understood as claiming the above contrivance when adapted to any other construction of printing press: and, particularly the shifting calico or other suitable material employed as a set-off sheet, which may be adapted to a variety of printing machines, and may be formed and made to move in many ways which convenience and other circumstances will dictate."—[*Inrolled April* 1827.]

To JOHN GUY *and* JACOB HARRISON, *both of the Parish of Workington, in the County of Cumberland, Straw Hat Manufacturers, for their invention of an improved method of preparing Straw and Grass to be used in the manufacture of Hats and Bonnets.*—[Sealed 14th July, 1826.]

THE subject of this patent purports to be an improved method of drying and preparing straw and grass for making ladies' hats and bonnets.

The straw is to be gathered soon after the corn has come to the ear, and long before it is in a state of maturity, that is in the latter part of the spring, or beginning of summer. The straws may be cut off near the ground, or drawn out of the ground with the roots. About one hundred and fifty straws are to be tied up in a bundle, and these bundles are to be laid upon a grass field, and spread out in the form of a fan, where they must be allowed to remain for two or three days and nights, occasionally turning them over: after this they are to be tied up in larger bundles, and suspended under sheds, upon lines or on hooks, for the purpose of drying up the sap.

From these places of shelter the bundles of straw are to be removed into the sunshine, whenever the weather is fine, and frequently turned over, but great care must be taken that they are always protected from rain, or other moisture, as the colour would become injured by damp. If by these means the straws are not brought to a beautiful gold colour, it may be desirable to expose them to the sun in glazed houses, until the gold-like appearance has been perfectly attained. The straw thus prepared may now be laid by for use, or for the market, in warehouses or stacks, observing that it be carefully protected from damp. It may be necessary to say, that wheat-straw is preferred for the purposes of making the hats and bonnets, but other straws will sometimes answer nearly as well.

When grass is the material intended to be made into bonnets in imitation of leghorn, the stems of grass are to be gathered when its seeds first make their appearance, and are to be prepared and dried in the manner above described.—[*Inrolled January*, 1827.]

To EDWARD BAYLIFFE, *of Kendal, in the County of Westmoreland, Worsted Spinner, (being one of the people called Quakers) for his invention of certain improvements in the Machinery used for the operations of drawing, roving, and spinning of sheep and lambs' wool.*—[Sealed 14th July, 1826.]

THE principal object of these improvements, is to deprive the wool of its elasticity, in order to enable its fibres to be drawn out to a considerable extent in straight lengths, and afterwards twisted or spun into worsted. The mode of doing this, is, first,—by the introduction into the drawing machine of a rapidly-revolving wheel, in contact with the front drawing roller, by means of which the fibres of wool are subject to considerable friction against the periphery of the said wheel, and their elasticity and curl is destroyed by the heat: secondly, by the employment of a moveable regulating roller, by which the extent of surface on the periphery of the wheel that the lengths of wool is to act upon, may be increased or diminished at pleasure, and consequently the effect regulated or tempered, as the quality of the wool may require: thirdly,—the employment of steam in a rotatory drum, or hollow wheel, in place of the wheel first described, for the purpose of heating the wool, in the process of drawing in order to facilitate the operation of straightening the fibres.

These objects may be effected in several ways, that is, the machinery may be variously constructed, and still embrace the principles proposed. Plate VI, fig. 9, shews one mode:—*a*, is the friction wheel; *b*, the front drawing roller, placed in the drawing frame in the same way as usual; the larger wheel *a*, constituting the lower roller of the pair of front drawing rollers; *c*, and *d*, are the pair of back drawing rollers, which are actuated by gear connected to the front rollers, as in the ordinary construction of drawing machines, the front rollers moving very considerably faster than the back rollers, and consequently drawing or extending the fibres of the sliver of wool as it passes through between them; *e*, is a guide roller, bearing upon the periphery of the large wheel; *f*, is a tension roller, which presses the fibres of wool down upon the wheel *a*.

Now, supposing the back rollers *c*, and *d*, to be turned with a given velocity, and the front roller *b*, to be driven much faster, the effect would be, that the fibres of wool constituting the sliver passing through the machine, would be considerably extended between *b*, and *d*, which is precisely the effect accomplished in the ordinary drawing frame; but the wheel *a*, introduced into the machine in place of the lower front drawing roller, being made to revolve much faster than *b*, the sliver of wool extended over the upper part of its periphery, from *b*, to the tension roller *f*, will be subjected to very considerable friction from the contact, and consequently the natural curl of the wool will be taken out, and its elasticity destroyed, which will enable the wool to proceed in a connected roving down to the spindle or flyer *h*, where it becomes twisted or spun into a worsted thread.

In order to increase or diminish the extent to which the fibres of wool are spread over the periphery of the wheel *a*, a regulating roller is adapted to the machine, as shewn at *g*, in place of the tension roller *f*. This regulating roller *g*, is mounted by its pivots, in bearings on the circular arms *h*, shewn by dots. These circular arms turn loosely upon the axle of the wheel *a*, and are raised or depressed by a rack and a winch, not shewn in the figure, the rack taking into teeth on the periphery of the circular arms. It will hence be perceived, that by raising the circular arms, the roller *g*, will be carried backward, and the fibres of wool pressed upon the periphery of the wheel to a greater extent. On the contrary, the depression of the circular arms will draw the roller *g*, forward, and cause the wool to be acted upon by a smaller portion of the periphery of the wheel *a*, and consequently subject it to less friction.

When it is desired to employ steam for the purpose of heating the wool, the wheel *a*, is formed as a hollow drum, and steam from a boiler in any convenient situation is conveyed through the hollow axle to the interior of the drum, which becoming heated by that means communicates heat also to the wool, and thereby destroys its curl and elasticity.

These proposed improvements, as before said, may be variously adapted to effect the intended object, therefore, the entire construction of a drawing and roving machine need not be represented, as the improvements are, first, the introduction of a wheel for the purpose of subjecting the wool to considerable friction, in order to destroy its elasticity. Second, the employment of a moveable tension roller, mounted upon segments, by which a greater or less portion of the wool may be brought in contact with the friction wheel: and third, the introduction of steam into a hollow wheel or drum, for the purpose of heating the wool, and thereby taking out the curl, and destroying the elasticity, so as to enable it to be spun into worsted. —[*Inrolled,* *January*, 1827.]

To THEODORE JONES, *of Coleman Street, in the City of London, Accountant, for his having found out and invented improvements on wheels for carriages.*—[Sealed 11th October, 1826.]

THIS invention is a mode of constructing wheels for carriages entirely of iron, and appears to be merely applicable to such wheels as are applied to waggons and carts for the conveyance of very heavy goods. The felly, or periphery of the wheels is made of cast iron, with conical holes on the outside, contracting towards the centre, through which the spokes, made of iron rods, are to be passed, and secured in the box, or nave, near the centre of the wheel by nuts screwed on to the reverse ends of the rods, by which means they are drawn tight.

Plate VII, fig. 1, represents one of the wheels in perspective. Fig. 2, is a side view of the same, and fig. 3; a sectional view of the box or nave, the outer cap being removed. The felly of thé wheel *a*, *a*, made of any required breadth, has a rib extending round it on the inside, principally for the purpose of giving strength, and in which any number of conical sockets are to be made according to the number of spokes which it may be thought necessary to employ.

The rods intended to form the spokes, as before said, are passed through the conical holes of the sockets from the outer part of the felly, and being made slightly conical at their outer extremities, necessarily tighten as they advance towards the centre.

The nave *b*, *b*, consists of two boxes, as seen in the perspective figure, into which the spokes are alternately passed, so as to stand at angles to each other, for the purpose of bracing the whole, and giving additional strength in a lateral direction.

By the representation of the box or nave of the wheel, shewn at fig. 3, it will be seen, that the inner extremities of the spokes have screw threads cut round them, upon which nuts are fitted; and the outer ends of the spokes being made fast in the felly by the conical sockets, as above described, the screwing of the nuts in the nave fix them firmly, and complete the wheel; which, unlike wheels of the ordinary construction, derive their support, not from the resistance of the lower spokes alone, but from the tension of the upper spokes also, and the outer cap of the nave being put on, the mode of fixing the spokes is altogether concealed.

A tire is to be placed round the periphery of the *felly*, by means of screws, or any other contrivances, and which may be renewed when worn. It will be perceived that the form of the wheel is cylindrical, and that it runs round in a perpendicular position, which is very much better than conical, or dished wheels, commonly applied to waggons. —[*Inrolled, April,* 1827.]

To COUNT ADOLPHE EUGINE DE ROSEN, *of Princes Street, Cavendish Square, in the County of Middlesex, in consequence of a communication made to him by a certain Foreigner residing abroad, for an invention of a new Engine for communicating power, to answer the purpose of a Steam Engine.*—[Sealed 1st August, 1826.]

THE subject of this patent is an apparatus for heating air which is intended to be applied to the working of a piston by its expansive power in the same way as steam engines are commonly actuated, and also for the purpose of heating water and converting it into steam.

Plate VII, Fig. 4, is a section of the apparatus, *a*, is a cylindrical vessel to be employed as a blowing machine, in which a piston *b*, is worked by any convenient means. This vessel is furnished with two valves *c*, *c*, opening inwards for the purpose of admitting air into the vessel. *d*, *d*, *d*, is a pipe or tube leading from the vessel *a*, both above and below the piston, the apertures of which pipe are furnished with valves opening outwards at *e*, *e*. The other extremity of the pipe *d*, communicates with the furnace *f*, *f*, below the fire grate.

The furnace is a cylindrical vessel surrounded with a jacket to prevent the radiation of heat: its lower part being contracted at *g*, which is the ash pit and is closed air tight at bottom. A worm pipe *h*, *h*, coiled round the interior of the furnace is, consequently, enveloped in the flames.

The fuel is supplied through a box *i*, at top, which has two sliders for the purpose of delivering the coal in small quantities.

If now the piston *b*, of the blowing machine be worked up and down, the air will be admitted into the vessel *a*, alternately through one of the valves *c*, *c*—that is, it will pass in by that valve from which the piston is receding, and at the same time the volume of air at the end of the vessel towards which the piston is approaching will be expelled through one of the valves *e*, *e* and the pipe *d*, and be discharged from that pipe as a blast into the lower part of the furnace below the fire grate.

The upper extremity of the worm pipe *h*, has a trumpet mouth opening near the middle of the furnace, and the blast of wind forced up through the fire in the manner described; enters this pipe at top in a heated state, and proceeding through the worm, becomes still more elevated in temperature till it is discharged at the reverse extremity of the pipe out of the furnace.

The air thus heated may be employed as an elastic material for driving a piston in a cylinder in the same manner as in the ordinary construction of steam engines, or instead of being applied to the working of a piston, may be carried into a closed box as in the figure, and there made to generate steam.

The box *k*, *k*, may be made of cast iron or any other fit material, with a series of shelves extending nearly across it, having at its upper part a small chamber *l*, containing water which is supplied through the pipe *m*, from the reser voir *n*, *n*, placed at the top of the furnace. The small chamber *l*, being thus filled, a pump *o*, is employed to inject the water in small quantities into the closed box *k*, when it descends into the upper shelf and runs down from thence on to the lower shelves in succession; at the same time the heated air from the pipe *h*, carried into the closed box, converts the water into steam which passes off by the pipe *p*, at bottom, for the purpose of working a steam engine, or for any other use that it may be required.—[*Inrolled February*, 1827.]

To JOHN WILLIAMS, *Ironmonger and Ship's Hearth Manufacturer, and* JOHN DOYLE, *merchant, both of the Commercial Road, in the County of Middlesex, for their invention of an Apparatus and Process for separating Salt from Sea Water, and thereby rendering it fresh and fit for use.*---[Sealed 4th August 1826.]

This apparatus is designed to be used on ship board, and consists principally of a cylindrical vessel filled with sand through which the salt water is passed, and in its passage the salt is taken up by the sand, and the water delivered after filtering in a fresh and pure state.

Plate VII, Fig. 5, shews the apparatus principally in section *a*, *a*, is a cylindrical vessel of wood or any other suitable material which is lined on the inside with cement as far as the filterer extends; *b*, is the bottom of the filterer formed with a grating which is supported by the frame of a stool; *c*, is a pipe extending from the under part of a cask, *d*, containing the salt water, and which pipe opens to the lower part of the vessel *a*, *a*, below the filterer. Over the grating *b*, there are placed several thicknesses of woven horse-hair, or a quantity of wool, and above this the vessel is filled with sand. On the top of the sand there is a plate *e*, like a piston pressing upon the sand and keeping it compact; the plate being held down by a screw *f*.

The salt water thus delivered from the cask *d*, by the pipe *c*, fills the lower part of the vessel *a*, and by the superincumbent pressure of the column descending from the cask, the water is forced upwards through the mass of sand, and runs off at the cock *g*, in a purified state.

There are man holes *h*, *h*, for the purpose of getting access to the interior when it is required to remove the sand and other matters, and the internal surface of the filterer is rendered rough in order to prevent the water from sliding up the sides of the vessel, instead of passing through the sand.—[*Inrolled February*, 1827.]

The principles here described though slightly varied in form, constituted the subject of a patent granted to A. H. Chambers, E. Chambers, and C Jearrard Esquires, for a new filtering apparatus. (see our Eleventh Volume, page 245.)—Editor.

To Thomas John Knowlys, *of Trinity College, Oxford*, Esq. *and* William Duesbury, *of Bousal, in the County of Derby, Colour Manufacturer, for their having invented certain improvements in Tanning.*—[Sealed 1st August, 1826.]

This improved mode of tanning, consists, in suspending the hides in a close vessel, from the interior of which the air is to be exhausted by means of an air-pump, and when the vacuum within is sufficiently perfect, the tanning liquor is admitted, which immediately penetrates into the pores of the hide, occupying the place from whence the air has been extracted. By these means the operation of tanning will be greatly facilitated.

Plate VII, fig. 6 is a section of the apparatus, *a*, *a*, is a vessel of cast iron, or other fit material, which is closed by a cap or cover, *b*, placed over the man hole, and is rendered perfectly air-tight at the joint; *c*, is a pipe and cock, communicating with an air pump, and *d*, is a similar pipe and cock, leading from the reservoir of tanning liquor.

The hides to be tanned are introduced into the vessel at the man-hole, and are suspended by hooks at the upper corners, with weights at bottom to keep the skin extended. As many of these hides as may be required to be tanned, are in this way placed within the vessel *a*, and when the lid is tightly fixed on, the air is to be extracted from the interior by means of an air-pump connected to the pipe *c*.

When a sufficient exhaustion has been effected within the vessel, the cock of *c*, is to be closed, and that of *d*, opened, and the tanning liquor introduced; after which the air-pump may be again worked to draw all the air from the pores of the skins, and to prevent ebulition, a quantity of oil is to be placed upon the surface of the tanning liquor.

The tanning liquor is to be first used in a weak state, and its strength increased daily, until the process is complete. A pump and tube *e*, is to be employed for drawing off the spent tan liquor.---[*Inrolled, February*, 1827.]

The subject of this patent is an example of the wide range through which a valuable hint may be sometimes usefully extended. In the second volume of our first series, page 36, will be found a communication from John Oldham, Esq. of the Bank of Ireland, on his improved method of sizing, dyeing, and wetting paper, for printing Bank Notes, and other purposes, which process was by placing the bundle of papers in a close vessel, and after exhausting the air from the vessel, and consequently from the pores of the paper, introducing the size dye or water, which instantly penetrated the paper in a more perfect way than had been effected by any other means that had been before resorted to.

The same mode of operating has been subsequently employed in dyeing, and in some other branches of the arts, with very great success, and is in the patent above, proposed to be applied to tanning. But with what propriety it can now be claimed as a new invention, we do not see; the exclusive right of employing the same principles as a novel process in tanning appears to us to be rather equivocal. EDITOR.

To JOSEPH BROWNE WILKS, *of Tandridge Hall, in the County of Surry, Esq., for his Invention of Improvements in producing Steam for Steam Engines.*—[Sealed 2nd August, 1826.]

THE invention which constitutes the subject of this patent, is the combination of a steam boiler with a coke oven, for the purpose of applying the heat evolved in the process of coking coals to the generating of steam in a boiler. By this contrivance, that heat which in the ordinary mode of performing the operation of coking is dispelled and lost, may be employed with advantage and economy.

No precise form of oven or boiler is set forth in the specification, but it is merely said, that the flue from the oven is to pass horizontally through the middle of the boiler, and then divide itself into two branches, returning in the same manner along the sides of the boiler, and joining again into one flue before it enters the chimney.

The patentee says, " I lay no claim to the exclusive use of coke ovens under steam boilers, for the purpose of generating steam therein, during the process of making coke, but I claim the application of a steam boiler, in the construction of a coke oven, by making the bottom of the boiler form the top of the oven.—[*Inrolled February,* 1827.]

In the Eighth Volume of the first series of our Journal of Arts, page 194, we have given the particulars of the Specification of Mr. De Iongh's Patent, dated February, 1824, for "constructing and placing a coke oven under or contiguous to steam or other boilers, so as to make the heat arising from making coke or other intense combustion in the said oven, subservient to the use of the boiler, instead of fuel, &c." consequently; it will be perceived that the idea of combining a coke oven and steam boiler, has been anticipated by the former, patentee, and we believe been extensively practised with great advantage. But the very nice distinction which has been drawn, (probably by some gentleman learned in the law,) between the present invention and the former, is truly admirable.—" I have," says Mr. de Iongh, " placed a *coke oven under a boiler*," then, says Mr. Wilks, " I lay no claim to a *coke oven under a boiler*," but " I claim a boiler placed *over a coke oven*." EDITOR.

To WILLIAM CLELAND, *of Pentonville, in the County of Middlesex, Gentleman, for his Improvements in Evaporations*.---[Sealed, 24th July, 1826.]

THE principal object of these improvements is to cool liquids, such as brewers' worts, distillers' wash, dyers' liquors, &c.; the mode proposed is, to separate the particles, by causing them to descend in a shower, through which a current of air is to be passed.

The rationale of this process depends upon the principle, that the steam from heated liquors carries off a very considerable quantity of caloric; if, therefore, the particles of the liquor can be so separated as to increase the surface, and consequently the quantity of steam evolved, the cooling process will by that means be facilitated.

The patentee has not exhibited drawings of any precise form of apparatus, but states, that over the boiler, or pan, containing the hot liquor, he places a vessel intended as a reservoir, into which the hot liquor is to be raised from the boiler, by means of a pump. The bottom of this reservoir is partially perforated with holes, like a colander, extending across the bottom, and about twelve inches wide. Through the colander the hot liquor descends in a shower, and the air having a free passage under the reservoir through the shower, drives off the steam, and cools the liquor.

The steam may be conducted into a chimney, and thence escape into the air, or it may be passed through tubes, and brought under other pans, for the purpose of heating other liquors, by which means a saving of fuel will be effected.

In order to increase the effect, several colanders may be placed one below the other, and the liquor be made to pass through them in successive showers. It is presumed, that the natural current of the air will be sufficient for the accomplishment of the object; but if it should be found necessary a blast of air may be produced, by means of a blowing machine.

Instead of employing cold air at all times, the patentee proposes, under some circumstances, to pass a current of dry heated air from a furnace through the shower of liquor, which air having been rendered extremely dry, is then capable of absorbing the steam or moisture which contained the heat, and this heated air may be mixed with the smoke and other vapours from the furnace, and be conducted in the manner above explained, under other evaporating pans, to heat them.—[*Inrolled, January,* 1827.]

Nearly the same process as that above described formed the leading features of a patent for making vinegar, granted to Mr.

J. Ham, of West Coke, in the County of Somerset, dated 7th October, 1824, in which it was proposed to separate the liquor into drops, that the air might act upon it in its most divided state. The liquor was proposed to be raised from the vat by a pump into a vessel above, and the only difference in the apparatus was, that instead of a colander in the bottom of the vessel, a number of birch twigs were placed upon which the liquor being poured it necessarily fell down in drops like rain into the vessel below, the air cooling it in its progress, and promoting the acidity, (see Vol. X, page 367, of the first series of this Journal.)

To WILLIAM PARSONS, *of our Royal Dock Yard, Portsmouth, Naval Architect, for his having invented certain Improvements in Building Ships or other Vessels, which improvements are calculated to lessen the dangerous effects of internal or external violence.*---[Sealed 24th July 1826.]

THE patentee describes the modes of putting together the ribs of that description of vessels employed for the East India service, and explains the present ineffectual mode of securing them merely by the flooring timber; to obviate which disadvantage, the present improved mode of strengthening vessels is suggested.

The proposed improvement is the introduction of cast iron framings, which are to be applied so as to connect the several ribs and other timbers together, and which are to be placed in every part of the vessel, forming them of course according to the situations to which they are to be applied.

In thus adding to the weight of the ship, the patentee considers that no disadvantages will arise, as the quantity of iron employed will in part supersede the necessity of ballast, and instead of weakening the vessel as ballast would do, it will give it additional strength.

As the iron pieces must be formed to suit the parts to which they are to be applied, no precise figure can be given, but they are to be made with grooves and rebates to fit and take hold of the ribs, and with holes to receive the bolts or other holdfasts.

The patentee says he claims the connecting frames for all purposes to which they may be applied in ship-building.—[*Inrolled January*, 1827.]

Novel Inventions.

Generating and Purifying Gas for Illumination, upon a new Plan.

In the 14th volume of the first series of our Journal, we noticed Mr. Pinkus's improvements relative to the production of gas, by means of a simple apparatus, which is to be adapted to the fire-place of a counting-house, or a kitchen-range, in order to supply illuminating gas, for the use of the house and premises immediately contiguous. This apparatus appears now to have been proved, and found fully to answer the expectations of the patentee; we shall therefore take an early opportunity of laying the plans before our readers, indeed, we only now withhold them at the request of the patentee, the foreign patents, which are in progress, not having been yet completed. The following is a paper presented to us by the inventor.

The superiority, brilliancy, and convenience of Gas Lights, having led to their introduction and use in most parts of the united kingdom, the attention of men of science, and capitalists, has been continually devoted to the formation and perfection of establishments necessary for ensuring extensive supplies of Gas to the public, and adopt-ing improvements to effect its purity. To attain the latter of these objects, various patents have been obtained, and numerous experiments tried: but hitherto the purest gas distributed, has been, when not in a state of ignition, extremely offensive; and when burnt in close rooms frequently injurious to the health. It is also deserving of particular notice, that notwithstanding the many improvements which have been effected, the numerous establishments which have been founded, and the remarkable extension of the use of gas, the public attention is now directed to the object of obtaining reductions in the price of that indispensable fluid.

The object of the patentee is to form a Domestic Gas Company, to furnish, or rather to enable every householder, and occupier of premises, to supply himself with a cheaper, purer, less obnoxious, and more brilliant gas, than any which has yet been produced; not in the spirit of opposition to the opulent and respectable Companies which have so long been established, but with that aim at fair and honourable competition, which must tend to the advantage of the public.

To prove the convenience and safety of the process, it is only necessary to state, that no additional fire-place or stove will be necessary for generating the gas required, the operation being performed by the combination of a particular apparatus with an ordinary kitchen-range, or other common fire-grate, so connected as not in the slightest degree to interfere with its usual purposes, the superfluous heat being used to effect the object; the gas then passes through a refrigerator and the patent purifier, into the gasometer, which may be placed in the cellar, or other convenient situation. The only attention which this process will require, will be for a short time (not half an hour,) in the morning before the fire is lighted, it being so safe and regular, as not to need the slightest notice during the day or night; and as the residium constantly returns to the retort, and is consumed, no nauseous remains are left to be disposed of.

The purification of the gas is effected by a new method, the obnoxious odour destroyed, and the gas rendered inoffensive, pure, and brilliant.

Patents have been obtained for the mode and apparatus for generating, and for purifying gas, and very heavy expences incurred in bringing the invention to complete perfection.

The patentee proposes to fix the apparatus on the premises where it may be required, at his own expence, and receive an extra remuneration for the first year only, according to the number of lights wanted; after which he engages that the whole expence per annum, including patent-right, shall not exceed one half the present cost of gas supplied by the leading Companies; but individuals may in all cases have the option of purchasing their right for a fixed sum, rated to the advantage of the purchasers.

It is conceived, that in towns and other places where gas establishments have not yet been formed, inns, manufactories, public works, and premises of various descriptions, the proposed Patent Domestic Gas Company will be able to render an important service, and confer an extensive advantage; and the proprietors beg to assure the public, that no exertion shall be spared to render the invention worthy of the encouragement and support of this great commercial country.

Communications may be addressed to Messrs. Paynter and Hawke, Nos. 178 and 283, Strand, (near Norfolk street), which will receive the earliest possible attention.

Whalebone Cloth.

(FROM THE ALLGEM HANDLUNGS-ZEITUNG.)

M. Schulz, of Prague, has taken out a Patent for the manufacture of a kind of cloth from whalebone. We are informed that the cloth obtained by this process bears a strong resemblance to silk, and is particularly adapted for making cravats, under-waistcoats, ribbons, &c.

New Glazing for Earthen Vessels without Lead.

This glazing consists of four parts of calcined soda and five of white sand, (free from iron,) which are mixed together, and reduced to a very fine powder. This powder, after being put into crucibles made of very compact clay, and previously rubbed with chalk on the inside, is exposed to the strongest heat of a potter's furnace. When taken out, the mass is found melted, and presents the appearance of blown glass ; it is afterwards reduced to an impalpable powder, in which state it is fit to be employed in glazing.

This glazing penetrates into the pores of earthen vessels, is susceptible of a beautiful polish, and not liable to be acted upon either by acids or alkalies.

" The above article," (says the Editors of the Bull. des Sciences Technolog.) " which appeared originally in the Allgem Anzeiger, has suggested the idea of many other compositions for glazing, equally free from lead—the following are some of them.

Thirty-two parts of Glass, 16 do. of Borax, and 3 of tartar—prepared in the same manner as the above, except that the borax is calcined separately.

Fifty parts of soda, 90 do. of silex, —cast the silex red-hot into cold water, then pulverize it, and melt the whole.

Eighty parts of soda, 70 do. of sand, and 10 of white clay—calcine the soda, and afterwards melt it with the other ingredients.

Three parts of calcined soda, and 4 of quartz sand—melted together.

One part of powdered pummice stone, mixed and melted with 1-16th of pulverized oxyde of manganese.

Mixture for Silvering Looking-Glasses, &c. By M. LACKLOTTI.

Two parts of mercury are to be dissolved with three of lead, and the mixture then poured upon glass which has been previously polished and heated. This composition is found to adhere to the glass with great firmness, and to cast a very pure reflection. Care must be taken to separate from the amalgama the coat of oxyde formed on it during its fusion.

Useful Alloy.

M. Frick, in melting together 50 parts of copper, 31.20 of zinc, and 18.75 of nickel, obtained a metallic alloy, white, not oxidible, very ductile, and which acquires a beautiful polish; in varying these proportions, viz. by taking 53.39 of copper, 29.13 of zinc. and 17.48 of nickel, he produced an alloy which has the sound and unchangable nature of silver, but harder. It is particularly suitable for ornaments, objects of saddlery, boxes, watch chains, &c. This alloy was sold at first at 12 francs per pound, but as nickel is sufficiently abundant in Germany, and as many artists are engaged in this composition the price will necessarily fail.—*Bull d'Encour. Juil.* 1826.

Polytechnic and Scientific Intelligence.

ASTRONOMICAL SOCIETY.

(Continued from Page 53.)

Feb. 8.—The annual general meeting of the society took place this day, when the Council presented their Eighth Report, which is much too elaborate for our insertion. It exhibits the increasing prosperity of the Society, and the advantages that have arisen and appear to be likely to result from their labours.

Two medals have been awarded this year by the Council. One to Sir Thomas Macdougal Brisbane for the inestimable benefit conferred by him on astronomical science, in the establishment of his observatory at Paramatta in New South Wales, and for the valuable and important series of observations made there by himself, and under his directions, during his residence as governor of that colony. The other to Mr. James Dunlop, for his disinterested and indefatigable pursuit of astronomical researches, subsequent to the departure of Sir T. M Brisbane from the colony of New South Wales, whereby he has added, in a most material degree, to our knowledge of the nebulæ of the southern hemisphere.

March 14.—The first paper read this evening was on an Ephemeris, of the place of Encke's Comet, during the time of its re-appearance at the end of the present year. Drawn up at the request of the Council of the Society. By F. Baily, Esq.

The first part of the ephemesis (to the end of the year 1828 is taken from Mr. Encke's own computations for Paris time Oct. 3, as inserted in Professor Schumacher's *Astronomische Nachrichten*, No. 123. That part of it which belongs to the ensuing year 1829, is taken from a letter addressed to the President of this Society by Dr. Olbers, and is computed for the time of midnight at Paris. The positions are computed for every third or fourth day only, at the beginning and end of the ephemeris, and for every second day towards the middle: this being quite sufficient to enable the observer to find the place of the comet in the heavens. The original computations are extended only to minutes of space; but the right ascensions are here converted into the nearest second of time, for the convenience of the observer.

There was next read a paper, "on finding the rates of time-keepers;" by E. Riddle, Esq. In this communication the author observes, that there are many persons fond of astronomy who are not possessed of a transit instrument, or who have not a convenient situation in which to place it; and many others, such as nautical men in particular, who have not the means of using one, who are desirous on many accounts, of knowing the *rates* of their chronometers, independent of the absolute time which they indicate. The method of equal altitudes on *each side* of the meridian is the course usually pursued on such occasions: but Mr. Riddle proposes another mode, often much more convenient in practice and equally correct in its results; viz. by taking equal altitudes of a fixed star on the *same side* of the meridian, on successive nights. It is well known that a star will, at the same sidereal hour, arrive at the same altitude, for several succeeding nights: the only difference which occurs, arising from the small change in the aberration, and also from the variation in the refraction. The former is insensible, if the interval between the observations be not too long; and for the latter, appropriate tables are given. The best time for the observation of such stars is when they are due east or west; and any known star may be chosen for the purpose. All we have to do therefore, is to note the difference of the two consecutive times at which the star attains the same altitude (whatever it be) on the same side of the meridian; and if that difference be *less* than $3^m. 55^s, 91$, the chronometer (presuming that it is regulated to mean solar time) will have *gained;* and if *more*, it will have *lost* so much in a sidereal day. And, if the observations are made at an interval of n days, the nth part of the difference between the times of observation, compared with $3^m\ 55^s, 91$, will in like manner give the mean rate for that interval; and, if this quantity be multiplied by 1,0027, it will give the rate for a mean solar day. The author concludes his paper with several practical examples of the method; and also with a formula for reducing a series of observations made on any one night, to the same altitude as shown by a series made on any other night: whereby the whole become strictly comparable.

Lastly, there was read a communication from the Rev. Thomas John Hussey, to Francis Baily, Esq. On forming a correct catalogue of the stars situated between 15° N. and 15° S. declination, and extending from $13^h\ 56^m$ to $15_h\ 4^m$ R.A. from the catalogues of Piazzi and Bradley, and the observations of Lalande and Bessel.

April 11.—A paper was read "On the construction of large Achromatic Telescopes." By A, Rogers, Esq.—In this paper the author describes a new construction of an Achromatic Telescope, the object of which is to render a small disc of flint glass available to perform the office of compensation to a larger one of crown, and thus to render possible the construction of telescopes of much larger aperture than are now common, without hindrance from the difficulty at present experienced in procuring large discs of flint glass. It is well known that in the ordinary construction of an achromatic object-glass, in which a single crown lens is compensated by a single one of flint, the two lenses admit of being separated only by an interval too small to afford any material advantage in diminishing the diameter of the flint lens, by placing it in a narrower part of the cone of rays, the actual amount of their difference in point of dispersive power being such as to render the correction of the chromatic aberration impossible, when their mutual distance exceeds a certain limit.

This inconvenience Mr. Rogers proposes to obviate, and obtain the advantage in question, by employing as a correcting lens, not a single lens of flint, but a compound one, consisting of a convex crown and concave flint, whose foci are such as to cause their combination to act as a plane glass on the mean refrangible rays. Then it is evident that by reason of the greater dispersive power of flint than of crown glass, this will act as a concave on the violet, and as a convex on the red rays; and *that* the more powerfully, according as the lenses separately have greater powers or curvatures. If, then, such a compound lens be interposed between the object-glass of a telescope, supposed to be a single lens of plate or crown glass, and its focus, it will cause no alteration in the focus for mean rays, while it will lengthen the focus for violet, and shorten it for red rays. Now this is precisely what is wanted to produce an achromatic union of all the rays in the focus; and, as nothing in this construction limits the powers of the individuals composing the correcting lenses, they may therefore be applied any where, that convenience may dictate; and thus, theoretically speaking, a disc of flint glass, however small, may be made to correct the colour of one of crown, however large.

But this construction possesses other and very remarkable advantages. For, first, when the correcting lens is approximately constructed on a calculation founded on its intended aperture, and on the refractive and dispersive indices of its materials, the final and complete destruction of colour may be effected, not by altering the lenses by grinding them anew, but by sliding the combination nearer to, or further from, the object-glass, as occasion may require, along the tube of the telescope by a screw motion, till the condition of achromaticity is satisfied in the best manner possible. And, secondly, the spherical aberration may in like manner be finally corrected by slightly separating the lenses of the correcting glass, whose surfaces should for this purpose be figured to curvatures, previously determined by calculation, to admit this mode of correction—a condition which the author finds to be always possible.

Mr. Rogers explains his construction by reference to a diagram, and states the rule for the determination of the foci of the lenses of the correcting glass in a formula which may be thus interpreted. "The focal length of either lens of the correcting lens is to that of the object-glass, in a ratio compounded of the ratio of the square of the aperture of the correcting lens to that of the object-glass, and of the ratio of the differences of the dispersive index of crown and flint glass, to the dispersive index of crown;" —for example, to correct the colour of a lens of crown or plate glass of nine inches aperture, and fourteen feet focal length (the dimensions of the celebrated telescope of Fraunhofer at Dorpat) by a disc of flint glass three inches in diameter, the focus of either lens of the correcting lens will require to be about nine inches. To correct it by a four inch disc will require a focus of about sixteen inches for each.

The author then remarks, that it is not indispensable to make the correcting glass act as a plane lens. It is sufficient if it be so adjusted as to have a shorter focus for red rays than for violet. If, preserving this condition, it be made to act as a concave lens, the advantage procured by Mr. Barlow's construction of reducing the length of the telescope with the same focal power, is secured: and he considers, moreover, that by a proper adaptation of the distances, foci, &c. of the lenses, we might hope to combine with all these advantages, that of the destruction of the secondary spectrum, and thus obtain a perfect telescope.

There was also read a portion of a paper "On the Occultation of δ Piscium observed in Blackman Street, in the month of February 1821. References to recorded observations of occultations in which peculiarities have been apparently seen, either at the moon's limb, or upon her disc; together with an enquiry how far certain hypotheses seem adequate to account for the phenomena. By James South, Esq."

PROCEEDINGS OF THE ROYAL SOCIETY OF EDINBURGH.

November 26th.—At a general meeting of the Royal Society, the Officers were elected for the present year.

Dec. 3.—DR. TURNER read the first part of a paper, entitled "An Examination of the Ores of Manganese."

A letter from CAPTAIN PARRY to Dr. Brewster was read, accompanying two sets of hourly meteorological observations made on the ice and on board the Hecla on the 17th of July last. The first of these sets of observations were made in $82\frac{1}{2}°$ N. latitude, the highest at which a meteorological instrument was ever used. The second set was made in lat. 79° 55′ in a harbour on the north-east of Spitzbergen. In this letter Captain Parry mentions the curious fact, that they experienced that season *at least twenty times as much rain* as in any other summer they passed in the arctic regions.

A Paper by Mr. Thomas Graham, M. A. was read on the influence of the Air in determining the Crystallization of Saline Solutions.

The following, among many objects of natural history and the fine arts, were presented to the Society by George Swinton, Esq. Secretary to the Government, Calcutta, and F. R. S. E.

1. Three fine Marble Statues of Burmese gods.
2. Two Models, as large as life, of a Dwarf now in Calcutta.
3. Head of a Dugong.
4. Numerous Barrels and Bottles, containing Snakes from various parts of India.
5. An Armadillo.
6. Ship Fish from Arracan.
7. Head of a Horned Beetle.
8. Book of Natural History in the Talien language.
9. Two Dresses of Carien Women of Tavoy.
10. Bamboo joints containing Tabasheer.
11. Specimens of the Shola, in its natural state, and formed into sheets like paper.
12. Corals and Shells.
13. Specimens of Oils, Varnishes, Bhela or marking Nuts, Gums, Minerals, &c.
14. Stuffed Birds.
15. Large Sponge, or Neptune's Cup, from Singapore.
16. The Leaf Insect from Sylhet.
17. Skeleton of a Boa Constrictor.
18. Petrified Trunk of a Tree from the Irawaddy.
19. Large Chama gigas from the South Seas.
20. A pair of Elephant's Tusks.
21. Skeleton of the Iguana, &c. &c. &c.

December 17*th*.—Conclusion of a Chemical Examination of the Oxides of Manganese. By. Dr. E. Turner.

A Notice on the formation of Alcoates, definite compounds of Alcohol and Salts, analogous to the Hydrates. By T. Graham, M. A.

January 7, 1828.—Francis Walker Drummond, Esq., and Sir W. G. Gordon Cumming, Bart., were elected Ordinary Members.

The Vice-President announced to the meeting that the Council had adjugded the biennial Keith prize to Dr. Brewster, for his communications regarding his discovery of two new immiscible fluids in the cavities of certain minerals.

The following papers were read:—

1. Account of a remarkable peculiarity in the Structure of Glauberite. By Dr. Brewster.

2. On the Chloro-ferro-cyanic Acid and its compounds. By J. Johnstone, A. M.

3, An Account of the Tracks and Foot marks found impressed on Sandstone in a quarry in Dumfries-shire. By the Rev. Dr. Duncan.

Specimens were exhibited.

4. Demonstrations of propositions published by Dr. M Stewart in 1716, at the end of his general theorems. By A. Galloway.

5. A letter from the Right Honourable the Countess of Morton, to Sir Walter Scott, accompanying a donation of models and plans, &c. connected with the erection of the Edystone Light House, and which had belonged to the late Mr. Smeaton, Civil Engineer.

6. Experimental inquiries concerning the Laws of Magnetic Forces. By W. S. Harris, Esq. of Plymouth.

January 21.—1. Determination of the Longitude of the Observatory of Edinburgh, from observations of the moon and moon-culminating stars. By Professor Wallace.

2. On the earliest Maritime Regulations of Modern Europe. By John Reddie, LL. D.

February 4.—Erskine D. Sandford, Esq. Dr. D. Maclagan, James Crawford Gregory, M. D. Sir Alexander Keith, Knight Marischal, and John Frost, Esq. were elected ordinary Members.

1. A notice regarding a Mass of Metallic Iron, (supposed to be meteoric) from South America. By T. Allan, Esq.

2. On the Natural History and properties of Tabasheer, the sileceous concretion found in the joints of the bamboo. By Dr. Brewster.

February 18.— 1. Notice regarding a compendious and easy method of performing the operation of Multiplication in Arithmetic. By Professor Wallace.

2. Part 1st. of a Memoir on the Geographical position of Ecbatana, the ancient capital of Media. By the Rev. J. Williams.

March 3.---Captain Maxwell, K. D. G. was admitted an Ordinary Member.

1. A notice of some experiments on the Absorption of Vapours by Liquids. By T. Graham, A. M.

2. Chemical examination of Tabasheer. By Dr. E. Turner.

Proceedings of the Society for Promoting the Useful Arts in Scotland.

December 1, 1827. --A notice by Dr. Brewster, on the Varnishes from the Varnish Trees of India was read, and specimens of articles varnished with them, and sent home by George Swinton, Esq. of Calcutta, were exhibited.

An account of the poisonous qualities of the Indian varnishes, by Dr. Brewster, was also read.

An account of the method of blasting rocks in Assam, communicated by George Swinton, Esq. of Calcutta.

There was also read an account of the Black Dye of Siam, by Captain Burney. Communicated by George Swinton, Esq.

December 19.---There was read a Description of a new Latch Lock, by the Rev. Mr. Brodie. The model of the Lock was exhibited.

A Pendulum Chronometer belonging to Andrew Waddell, Esq. executed by Mr. David Whitelaw, of Edinburgh, was described and exhibited.

Specimens of Screws made by Mr. Clark were exhibited.

There were read Observations on the Low Temperature of Steam escaping from under High Pressure. Communicated by Thomas Graham, A. M.

An improved Air Pump was described and exhibited by Mr. Dunn.

The following gentlemen were elected honorary members:

Captain Parry, R. N. John Oldham, Esq. of the Bank of Ireland.

Mr. John P. Bertram, Clyde Street, was elected an Ordinary Member.

Dr. Hugh Colquhoun, Glasgow, and Mr. Thomas Clark, Glasgow, were elected associate members.

January 9, 1828.---There was read a notice of a method of manufacturing the Nepaul Paper, communicated by George Swinton, Esq.

Mr. J. W. Johnston of Durham was elected an associate member.

January 23.---An account of a new process for obtaining Absolute Alcohol, by Thomas Graham, A. M. was read.

A farther account, by Dr. Wallich, of the Manufacture of the Nepaul Paper was read. Specimens of this Paper in its natural state, and as remanufactured at Calcutta, were exhibited.

There were exhibited to the Society impressions of Drawings executed on Talc. Communicated by George Swinton, Esq.

An account of an Engine for cutting the tools for grinding Lenses, by the Right Honourable Lord Oxmantown, was read.

The Right Hon. Lord Oxmantown was elected an Honorary Member.

Feb. 6.---The following gentlemen were elected Honorary Members: S. P. Rigaud, Esq. A. M. F. R. S. Savilian Professor of Astronomy, Oxford.---G. B. Airy, Esq. Lucasian Professor of Mathematics, Cambridge---Rev. W. Whewell, M. A. Trinity College, Cambridge.

The following papers were read. Observations on the formation of Ice in India. By David Scott, Esq.

Notice respecting a powerful Aromatic Oil obtained from Malwa in India, from a particular species of grass.

Mr. Lizars exhibited impressions of Engraving on different kinds of Paper, including the Nepaul Paper exhibited at last meeting of the Society. Mr. L. reported that the coarser kind of the Nepaul Paper is well adapted for the purposes of Engraving.

Feb. 20.---Observations on Street Railways. By Mr. Alexander Scott, Ormistan, were read

A Description of a Method of Cutting leading Screws, exhibited at a former meeting, was read. Drawings of the Apparatus employed were exhibited. By Mr. J. Clark.

The Working Model of a Hydraulic Engine by Mr. Ruthven was exhibited.

A Notice regarding the proper forms of Taps and Dies for cutting metal Screws. By John Robison, Esq. F. R. S was read.

Sir John Seppings was elected an Honorary Member.

Robert Aytoun, Esq. and James Tod, Esq. were elected Joint Secretaries of the Society, in room of Dr, Turner and Professor Wallace, who retired.

March 5.---There was read a Notice of the qualities and adaptation af a species of Stone brought from Caithness. Communicated by Sir John Sinclair, Bart. Specimens of the Stone were exhibited.

The masses of stuff from Nepaul for making paper having now arrived, were exhibited..

National Repository of Works of Art.

This Institution, the commencement of which we mentioned in our last, begins to assume a character of considerable importance; for, beside the support of many of the nobility and gentry, His Majesty has signified his desire to become Patron.—Our present limits will not allow us to say much upon the subject.

The Committee of Management have advertised a very slight sketch of the plan upon which they intend to proceed in the selection of articles for exhibition, viz.

First Class.—Entirely new and ingenious constructions of any sort where a new principle is discovered, or one before known but never practically adopted, is brought into operation.

Second Class.— New adaption of some known principle, but in a manner essentially different from all that has been done before in that line of manufacture or mechanical workmanship.

Third Class.—Every sort of improvement upon a discovery already made, by which the preparation of any article is facilitated, or its utility increased. In this class may be exhibited also such objects as are highly finished or distinguish themselves by exquisite taste; likewise, every description of elaborate ornamental workmanship, such as would not find a place in an exhibition of arts.

The project appears to have met with very great encouragement from the manufacturing districts, and the Repository is intended to be opened in the course of the present month. We find that the attempt will be rather premature; but, next year, when the plan is sufficiently known, have no doubt that an exhibition will be produced worthy of the British nation.

Scotch Patents,

GRANTED IN 1827.

(*Continued from Page* 112)—VOL. XIV.—FIRST SERIES.

June 14. For certain improved machinery for spinning cotton. To Philip Jacob Heisch, London.

30. For improvements in machinery for hackling or dressing and cleaning hemp, flax, and tow. To Solomon Robinson, county of York.

July 2. For certain improvements in machinery for the purpose of spinning wool, cotton, &c. To Lambert Daxter, London.

5. For certain improvements on locomotive or steam carriages. To Timothy Burstall and John Hill, both of Leith.

17. For certain processes for rendering distillery refuse productive of spirits. To Robert More, county of Stirling.

August 4. For certain improvements in the process of preparing and cooling worts or wash from vegetable substances for the production of spirits. To Robert More, county of Stirling.

8. For certain improvements in apparatus for spinning fibrous substances. To William Church, of Birmingham.

23. For certain improvements on capstans. To Charles Philips, Esq. county of Kent.

Sept. 5. For certain improvements in sizing, glazing, or beautifying the materials employed in the manufacturing of paper, pasteboard, &c. To Gabriel de Soras, county of Middlesex.

October 3. For an improvement on steam engines. To Peter Burt, county of Middlesex.

24. For a new and improved method of forming and making of hollow cylinders, guns, ordnance, retorts, &c. To Joshua Horton, county of Stafford.

November 2. For certain improvements in bedsteads, beds, couches, and other articles of furniture principally designed to be used on ship-board. To Samuel Pratt, county of Middlesex.

2. For certain improvements on bedsteads, and in the making, manufacturing or forming articles to be applied to or used in various ways with bedsteads, from a material or materials hitherto unused for such purpose. To Thomas Breidenback, county of Warwick.

22. For an improved apparatus for the better manufacture of sugar from the canes. To William Fawcett, county of Lancaster.

28. For certain processes and apparatus for printing and preparing for manufacture yarns of Linen, Cotton, Silk, Woollen, or any other fibrous material. To Bennet Woolcroft, County of Lancaster.

27. For certain improvements in the combination and arrangement of mechanical powers applicable to the purposes of driving machinery, and lifting and moving heavy bodies. To Lemuel Wellman Wright, County of Surrey.

29. For certain improvements in the combination and arrangement of machinery for making metal screws. To Lemuel Wellman Wright, County of Surrey.

December 6. For a cartridge or case, and method of more advantageously enclosing therein shot or other missiles, for the purpose of loading fire-arms and guns of different descriptions. To Joshua Jenour, jun., County of Middlesex.

List of Patents

GRANTED IN THE UNITED STATES OF NORTH AMERICA, 1827.

FOR INVENTIONS AND IMPROVEMENTS.

In rolling iron, Abraham S. Valentine, Bellefont, Centre county, Pen, Jan. 3.

In the water gate for penstocks, or flumes for mills, Henry Potes, Christiansburg, Montgomery county, Virginia, Jan. 9.

In making hoes, by rolling out cast or any other steel, Chauncey Bulkley, Colchester, Connecticut, Jan. 10.

In making irons for planes; and jointers, double and single, and of all sizes and shapes, by rolling together the steel, Charles E. West, Colchester, Connecticut, Jan. 10.

In the water-proof mortar or cement, stated by him to be from a mineral, not known or used for that purpose before his application; his former patent on this subject, dated on the 11th of January, 1826, being cancelled on account of an incorrect specification; Simeon Guildford, Washington, D. C Jan. 16.

In the grist mill, Anthony Bencine, Caswell county, N. Carolina, Jan. 16.

In the plough for planting corn, &c., Hermon Russell, Lichfield, Lincoln county, Maine, Jan. 16.

In the construction of stills, for the distillation of rum, whiskey, essences, and other spirituous liquors and cordials, Edmund Capen, Boston, Mass, Jan. 17.

Of a machine, called the bearded chisel mortising machine; Silas Metcalfe, Wilmington, Vermont, Jan. 17.

In economizing the charring of wood, and the more effectual procuring of inflammable gas for working pneumatic gas engines, and other useful purposes, by a new combination of apparatus or machinery, Samuel I. Jones, Philadelphia, Jan. 17.

In the method of heating ovens, rooms, &c., Michael B. Portiaux, Richmond, Va. Jan. 17.

In the mode of making pipes, tubes and gutters, of all kinds, for the conveyance of water, above or below the surface of the earth, from clay or argillaceous earth, by machines and various operations; Joseph Putman, Salem, Mass, Jan. 17.

In the grist mill, William Benbow, Guildford county, N. C. Jan. 19.

In the mode of generating steam, Levi Silliman, Albany, New York, Jan. 19.

In stirrup irons, Daniel Powles, Baltimore, Jan. 26.

In bedstead joints and sacking bottoms, Daniel Powles, Baltimore, Jan. 26.

In the press for tobacco, cotton, and other purposes, Benjamin R. Curtis, Richmond, Va. Jan. 29.

In the machine for planking hats, Robert Bacon, Boston, Jan. 31.

In the machine for tonguing and joining boards, Elijah B. Clark, Damascus, Penn, Jan 31.

In the lamp apparatus, for heating and boiling water, and other economical purposes, Thomas Green Fessenden, Boston, Jan. 31.

In the principles of machines for navigation; John James Giraud, Baltimore, Jan. 31.

In pumps, called "the Mariner's Friend;" James Robinson and Luke Shaw, Bath, Maine, Feb. 1.

In the construction of pedestal feet for hand-irons; Edmund Smylie, New York, Feb. 1

In the gun-lock, Simon Cromwell, Edgecomb, Maine, Feb. 3.

In the grist mill, Edward Newman, Guildford county, N. C. Feb. 6.

In the machine for cutting straw, Thomas Benbow, Guildford county, N. C. Feb. 6.

In the horizontal wind wheel or wind mill, Thomas P. Jones, New Castle, Delaware, Feb. 6.

In the machine for shelling corn, Edward Newnam, Guildford county, N. C. Feb. 7.

In steam boilers, for using anthracite coal, John Barker, Baltimore, Feb. 7.

In the chair, Jacob Daley, Baltimore, Feb. 9.

In machinery for pressing bricks, Alfred B. Crossman, Huntingdon, Suffolk county, New York, Feb. 9.

In the horizontal cast iron paint mill, Origen Packard, Wilmington, Vermont. Feb. 12.

In opening and shutting the water gate for mills, &c., Origen Packard, Wilmington, Vermont, Feb. 12.

In burning lime and brick, and boiling kettles, Solomon Hill, New Milford, Connecticut, Feb. 12.

In the rocking churn, John G. Philip, Kinderhook, New York, Feb. 15.

In the method of making copperas; Isaac Tyson, Baltimore, February 15.

In the washing machine; Chester Stone, New Haven, Connecticut, Feb. 17.

In a mode of preventing moths, or worms, from destroying hides, skins, furs, and peltry of all kinds; Samuel Storm, New York, Feb. 17.

In the machine for grinding or mixing earth, for making bricks; Benjamin K. Hill, Richmond county, Georgia, Feb. 17.

In the hay, and grain, horse-rake; Moses and Samuel Pennock, Pennsylvania, Feb. 17.

In the machine for pressing cotton, &c. Philemon White, Chatham County, N. Carolina, Feb. 19.

In the mode of constructing locks, or door fastenings, &c.; John Brown and George W. Robinson, Providence, Rhode Island, Feb. 20.

In the plough; Ryland Rhodes, Charlottesville, Albermarle county, Virginia, Feb. 20.

In the percussion gun-lock, for rifles, &c.; William A. Hait, Fredonia, N. York, Feb. 20.

In making salt; Banajah Byington, Salina, New York, Feb. 21.

In the art of building and constructing Ships, &c.; Thomas W. Bakewell, Cincinnati, Ohio, Feb. 21.

In the machine for clearing grounds of logs and brush, Squire Collins, Hillsdale, Columbia county, New York, Feb. 22.

In the art of inlaying gold or any other metal, in turtle or tortoise-shell and horn, for various ornamental and fancy articles, Uriah Bailey, Massachusetts, Feb. 22.

In manufacturing handirons, Edward Smylie, New York, Feb. 22.

In the manufacture of suspenders, A. L. Van Horn, Philadelphia, Feb. 22.

In the pump used for steam boilers, Alfred Judson, New York, Feb. 23.

In bedsteads, Chester Johnson, New York, Feb. 24.

In the bee-hive, C. Wiggins, Pennsylvania, Feb. 27.

In the grist-mill, Benjamin Overman, N. Carolina, Feb. 28.

In finishing paper, Ira White, and Leonard Gale, Vermont, Feb. 28.

In cutting garments, James G. Wilson, New York, Feb. 28.

In propelling boats, E. Fuller, R. Island, March 2.

In the mode of blowing and striking for blacksmiths, L. Hoyt, and E. Pierce, New York, March 3.

In laying ropes, called the combined jacks, rope layer, and breast-work, David Myerle, Philadelphia, March 3.

In making watch seals, S. Davis, H. P. Rabbitt, and B. B. Grinnell, Providence, Rhode Island, March 3.

In making shovels, Oliver Ames, Massachusetts, March 5.

In the machine for turning tenons. John W. Sweet and William Stedman, Massachusetts, March 5.

In the machine for grinding apples, H. E. Paine, and S. H. Russel, Ohio, March 5.

In bridges, William Woodmansee, New York, March 6.

In the machine for shearing cloth, James Collins, Maine, March 6.

In the water wheel for saw mills, Thomas Shute, Tennessee, March 6.

In a machine for cutting metallic and other hard substances, John H. Hall, Virginia, March 7.

In the spring hammer, for blacksmiths, James Rainey, North Carolina, March 7.

In a composition of matter with which marbles, granites, and stones of all descriptions are perfectly imitated, Louis Matthy, New York, March 7.

In inserting, or ingrafting teeth, E. A. Bigelow, Vermont, March 8.

In spur or bevel gearing for mills, &c. Charles Neer, Waterford, Saratoga county, New York, March 9.

In crank and wheel dampers for chimneys, James Reilly and John Flanagan, Waynesburg, Franklin county, Penn March 10.

In the horizontal wind mill, Jonathan Reynolds, America, Dutchess County New York, March 15.

In the machine for cutting straw, &c. Calvin Chamberlin, America, Dutchess County, New York, March 15.

In the manufacture of hatter's cards or jacks, Joseph C. Seely, Dutchess county, N. York, March 15.

In the mode of constructing the feet of brass hand-irons, &c., John Griffiths, N. York, March 15.

In an instrument called the wheelwright's assistant for turning and boring hubs, &c., Cyrus W. Beach, Schoharie, N. York, March 16.

In shelling corn, George E. Waring, Westchester county, N. York, March 16.

In extracting alcohol from common proof spirits, by the use of steam, A. Wolcott, and N. Wolcott, Bloomfield, Ontario county, N. York, March 19.

In a spring temple for looms, A. Jenks, and J. Clewell, Holmesburg, near Philadelphia, March 19.

In the grist mill crusher and sheller, John G. Morse, Randolph county, N. C. March 20.

In the machine for making bricks, David Rising, Alchester, Vermont, March 21.

In the method of pumping water out of Ships by manual power, Thomas Brownell, N. York, March 23.

In an improved cooking stove, Joseph R. Page, Philadelphia, March 24.

In a machine for pressing, and for lifting, heavy bodies, Samuel Andrews, Bridgetown, Cumberland county, Maine, March 24.

In the twin plough, Noble G. Cryer, Wentworth, Rockingham county, N. Carolina, March 24.

In the churn, S. L. Bagley, Hillsdale, Columbia county, N. York, March 24.

In the method of grinding and polishing hard substances, Benjamin Green, Windsor county, Vermont, March 27.

In the horse rake, Jeremiah Baily, Philadelphia, March 30

In the manufacture of tobacco, John Allen, Jr. and Charles Geoghegan, Richmond, Virginia, April 3.

In making watch keys, John S. Davis, Providence, Rhode Island, April 3.

In cutting wood into a circular form for the sides of tubs, buckets, &c. Jeremiah Bailey. Philadelphia, April 7.

In the machine for grinding apples, Constant H. Wicks, Paris, Oneida county, New York, April 9.

In making hominy, Robert Campbell, Martinsburg, Virginia, April 9.

In the paddle wheel of a steam boat, Robert L. Stephens, Hoboken, New Jersey, April 10.

New Patents Sealed in 1828.

To William Marshall, of Fountain Grove, in the parish of Huddersfield, in the County of York, shear manufacturer, for his invention of improvements in machinery for cutting or shearing, cropping and finishing cloth and other articles, manufactured from wool or other raw materials.--26 April.—2 Months for Inrollment.

To Thomas Breidenback, of Birmingham, in the County of Warwick, merchant, for his invention of a machine, or improved mode by use of machinery for forming or manufacturing tubes or rods, and for other purposes.--26 April. 4 Months.

To James Griffen, of Witny Moor Works, near Dudley, in the County of Worcester, scythe manufacturer, for his invention of an improvement in the manufacturing of scythe backs, chaff knife backs, and hay knife backs.—26 April.—6 Months.

TQ John James Watt, of Stracey Street, Stepney, in the County of Middlesex, surgeon, for his discovered by the application of a certain chemical agent, by which animal poison may be destroyed and the disease consequent thereon effectually prevented.—29 April.—6 Months.

To Charles Carpenter Bombas, of the Inner Temple, Esq. for his invention of improvements in the propelling of locomotive carriages, and machines, and boats, and other vessels.—29 April.—6 Months.

To Thomas Millman, of Mill Wall, Poplar, in the County of Middlesex, mast maker, for his invention of certain improvements in the construction and fastening of made masts.—1st of May.—6 Months.

To Jonathan Brownill, of Sheffield, in the County of York, cutler, for his invention of an improved method of transferring vessels from a higher to a lower level, or from a lower to a higher level on canals ; and, also, for the more conveniently raising or lowering of weights, carriages, or goods on rail roads, and for other purposes.--1st of May.-6 Months.

To James Palmer, of Globe Road, Mile End Road, in the County of Middlesex, paper-maker, for his invention of certain improvements in the moulds, machinery, or apparatus for making paper.—6 May.—6 Months.

To Thomas Adams, of Oldbury, in the County of Salop, manufacturer, for his invention of certain improvements on instruments, trusses, or apparatus for the relief, or cure of hernia or rupture.—6 May.—6 Months.

To Francis Westley, of Leicester, cutler, for his invention of certain improved apparatus to be used for the purpose of whetting, or sharpening the edges of the blades of knifes or other cutting instruments.—6 May.—2 Months.

To Samuel Brooking, Esq. of Plymouth, in the County of Devon, a rear-admiral in our royal navy, for his having invented a certain turning or shipping fid for securing and releasing the upper masts of ships and vessels.--6 May.—6 Months.

To Matthew Fullwood, junior, of Stratford, in the County of Essex, Gentleman, for his invention of cement mastic or composition, which he intends to denominate German cement.—6 May.—2 Months.

To John Benjamin Macneil, of Foleshill, Coventry, engineer, for his invention of certain improvements in preparing and applying materials for the making, constructing, or rendering more durable, roads and other ways, which materials so prepared are applicable to other purposes.---6 May.—6 Months.

To Thomas Jackson, of Red Lion Street, Holborn, in the County of Middlesex, watch-maker, for his invention of a new metal stud, to be applied to boots, shoes, and other like articles of manufacture.—13 May.—6 Months.

To John Ford, of Wandsworth Road, Vauxhall, in the County of Surrey, machine-maker, for his invention of certain improvements in machinery for clearing, opening, scribbling, coombing, slubbing, and spinning wool, and for carding, roving, or slivering and spinning cotton, short stapled flax hemp and silk, either separately or combined: and for spinning or twisting long stapled flax hemp, silk, mohair, or other fibrous substances, and either separately or combined.—13 May.—6 Months.

To Thomas Bonsar Crompton, of Tamworth, in the County of Lancaster, paper-maker, and Enoch Taylor, of Marsden, in Yorkshire, millwright, for their invention of certain improvements in that part of the process of paper-making which relates to the cutting.—13 May.—2 Months.

To Charles Chubb, of St. Paul's Church Yard, in the City of London, patent lock manufacturer, for his invention of certain improvements in the construction of latches, which may be used for fastening doors or gates.—17 May. 6 Months.

To Thomas William and John Powell, of the City of Bristol, glass merchants and stone-ware manufacturers, for their invention of certain improvements in the process, machinery, or apparatus, for forming, making, or producing moulds or vessels for refining sugar; and, in the application of materials hitherto unused in making the said moulds.—17 May.—2 Months.

Meteorological Journal kept at the London Institution.

DATE.	TIME.	BAROM.	Thermometer. IN.	Thermometer. OUT.	WIND.	REMARKS.
APRIL 26	9	30·00	56	49·8	S. W.	Fine
	3	30·00	59	55·4	S. W.	Very Fin.
28	9	30·35	57	56·8	S. W.	Fine
	3	30·35	62	64·6	S. W.	Ditto
29	9	30·30	58	57·6	W.—S. W.	Ditto
	3	30·30	64	67·8	S. W.	Ditto
30	9	30·35	58	59·8	N.	Cloudy
	3	30·40	60	61·2	N. by E.	Cloudy
MAY 1	9	30·40	55	51·4	N. E.	Foggy
	3	30·40	57	54·2	N. E.	Fine
2	9	30·35	57	52·2	N.	Ditto
	3	30·35	58	55·6	N.	Ditto
3	9	30·30	57	51·8	E.	Rain
	3	30·30	59	55·6	E.	Fine
5	9	29·75	56	52·4	N. W.	Showery
	3	29·75	59	56·8	N. W.	Fine
6	9	29·80	55	49·6	W.	Foggy
	3	29·80	58	53·2	W.—N. W.	Showers
7	9	29·90	55	50·2	N.	Cloudy
	3	29·90	57	53·4	N. E.	Cloudy, rain at night
8	9	29·90	56	53·2	N. by E.	Ditto
	3	29·95	59	55·4	N. E.	Ditto
9	9	30·10	55	50·2	N. W.	Ditto
	3	30·15	56	56·4	N. W.	Ditto
10	9	30·20	56	53·2	E.	Fine
	3	30·20	59	59·8	W.	Cloudy
12	9	30·30	56	52·2	N.	Fine
	3	30·30	59	59·8	W.	Ditto
13	9	30·30	57	57·2	W.—S. W.	Ditto
	3	30·30	60	62·4	W.	Ditto
14	9	30·20	59	57·8	N. E.	Ditto
	3	30·15	61	61·8	E.—N. E.	Ditto
15	9	30·10	59	57·2	E.	Ditto
	3	30·05	63	62·4	E.	Ditto
16	9	29·95	60	60·4	N. E.	Ditto
	3	29·90	64	65·6	E.—N. E.	Fine, thu. & ligt. at night
17	9	29·85	61	61·8	E.	Fine
	3	29·85	64	67·4	E.	Ditto
19	9	29·85	58	57·6	E.	Fine
	3	29·90	63	61·2	E.	Ditto
20	9	29·90	59	58·8	E.	Ditto
	3	29·90	62	62·4	E.—N. E.	Ditto
21	9	29·65	58	57·4	E.	Rain, about 9.
	3	29·65	60	59·2	E.	Cloudy, Rain at 6.
22	9	29·65	57	56·8	E.—N. E.	Rain
	3	29·65	59	59·2	E.	Cloudy
23	9	29·65	60	56·6	N. by E.	Ditto
	3	29·60	63	59·4	E.	Ditto
24	9	29·55	60	59·8	S. by E.	Heavy rn. about 6 m.
	3	29·50	64	64·2	S. E.	Fine

CELESTIAL PHENOMENA FOR JUNE, 1828.

D.	H.	M.	S.	
1	0	0	0	⊙ before the clock 2′ 33″
1	12	0	0	☾ in conj. with β in Capri.
2	20	0	0	☿ 132 in Taurus.
3	11	47	39	♃'s 2nd satt. will immerge.
4	11	2	0	☾ in ☐ last quarter.
5	0	0	0	⊙ before the clock 1′ 54″
6	18	0	0	☾ in conj. with ε in Pisces.
6	23	0	0	☾ in conj. with ζ in Pisces.
7	11	1	50	♃'s 1st Satt. will immerge.
9	10	0	0	☿ in conj. with ε in Gemini.
10	0	0	0	⊙ before the clock 58″
10	15	0	0	☽ in conj. with 1 δ in Taurus.
10	15	0	0	☾ in conj. with 2 δ in Taurus.
10	17	0	0	☾ in conj. with ε in Taurus.
11	12	10	22	♃'s 3rd Satt. will immerge.
11	23	12	0	Ecliptic Conj. or ● New Moon
15	0	0	0	Clock before the ⊙ 4″
16	2	0	0	☽ in conj. with 1 α in Can.
16	3	0	0	☽ in conj. with 2 α in Can.
17	1	0	0	☽ in conj. with ο in Leo.
17	11	0	0	☽ in conj. with π in Leo.
17	12	0	0	☿ in conj. with ♄ Long. 18° in Gemini ☿. lat. 1° 36′ N. ♄ lat. 1° N. dif. lat. 36′.
18	17	0	0	♂ in conj. with τ in Sagitt.
19	14	0	0	☽ in conj. with υ in Leo.
20	0	0	0	Clock before the ⊙ 1′ 9″
20	2	52	0	☽ in ☐ first quarter.
21	0	8	0	⊙ enters Cancer.
22	21	0	0	☽ in conj. with λ in Virgo.
22	21	0	0	☽ in conj. with ♃. Long. 4° in Libra. ☽ lat. 57′ 50″ N. ♃'s lat. 1° 14′ N. diff. lat. 16′ 10″
24	5	0	0	☽ in conj. with 4 ζ in Libra.
24	13	0	0	☽ in conj. with ϑ in Libra.
25	0	0	0	Clock before the ⊙ 2′ 13″
27	3	43	0	Ecliptic opposition, or ○ Full Moon.
28	21	0	0	☾ in conj. with β in Capri.
30	0	0	0	Clock before the ⊙ 3′ 14″
30	20	0	0	☾ in conj. with δ in Aquarius.

☽ The Waxing Moon.—☾ The Waning Moon.

Rotherhithe J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR APRIL AND MAY 1828.

1828.	Thermo.		Barometer.		Rain in inches.	1828.	Thermo.		Barometer.		Rain in inches.
	Hig.	Low.	High.	Low.			Hig.	Low.	High.	Low	
APRIL						MAY					
26	61	41	29,96	29,82	,125	11	66	47	30,03	30,00	
27	63	33	30,17	30,16		12	65	48	30,16	30,11	
28	70	37	30,20	Stat.		13	66	38	30,18	30,16	
29	73	39	30,09	30,07	,05	14	71	38	30,12	30,06	
30	64	47	30,29	30,07		15	66	41	30,02	30,00	
MAY						16	71	51	29,85	29,85	
1	60	35	30,29	30,26		17	72	51	29,81	Stat.	
2	61	34	30,19	30,05		18	63	51	29,79	29,76	
3	58	40	29,96	29,94		19	64	40	29,76	Stat.	
4	60	48	29,80	29,70		20	66	49	29,76	29,71	
5	54	42	29,70	29,66		21	61	45	29,56	29,54	
6	60	37	29,70	29,66		22	63	47	29,56	29,54	,075
7	58	35	29,84	29,76	,025	23	64	45	29,57	29,53	,15
8	59	44	29,85	29,84		24	62	51	29,45	29,40	,55
9	61	33	30,03	29,96		25	63	51	29,74	29,61	,15
10	64	33	30,11	30,07							

LOWER EDMONTON **CHARLES H. ADAMS.**

Lat. 51° 37′ 32″ N 30 Long. 3′ 51″ W. of Greenwich.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. IV,

[SECOND SERIES.]

Original Communications.

ART. XVI.—ON THE PROPER FORMS FOR TAPS AND DIES. BY MR. JOHN ROBINSON, OF EDINBURGH.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN.—I use the freedom of presenting to your inspection a paper on the proper forms of taps and dies, for cutting screws, which was lately read before the Society of Arts here; if you think it of sufficient importance to occupy a place in your Journal, it is at your service to insert, or to make such extracts from as you may think proper.

There are few operations in practical mechanics of more frequent occurrence than the making of screwed work, and still fewer in which there is a greater variety of methods and contrivances resorted to, in order to produce useful results I do not at present propose to enter on the theoretical principles of any of the methods followed for this purpose, or even to notice the processes to which artists have recourse, when screws of rigid accuracy are required, but shall confine myself to the consideration of the proper form to be given to the most important, because most generally used implements. I need hardly add that I mean taps and dies.

In the forming of these instruments, we have almost as many fancies as there are workmen who use them; some file longitudinal grooves in their taps, others fill them into prisms of three, four, or more sides, some give them much taper, others very little; but all find that great force is necessary in applying them so as to produce a full thread, and that almost invariably a part of the thread is formed by the burr which is turned up by the force of the tap. Much time is also consumed by the necessity of working slowly, to avoid bursting the work, and by the frequent removal and cleaning of the tap. The occasional breaking of a tap in the work, is also a consequence of the erroneous form given to it, which makes so great a strain necessary to force it round.

In the formation of the dies, the same differences occur in practice, a variety of notches and cutting angles are made, in the hope of producing a rapid effect; though every workman knows that one cutting edge properly applied, is better than many when used injudiciously; accordingly it is found that when a piece of work properly prepared for being screwed, is put through a die stock, it at first frequently comes out with a double thread, or a set of confused scratches; this arises from the form of the dies being such, that at the commencement the work is pressed against a number of angular points which easily imbed themselves in its surface, though it may happen to be presented to them in a wrong direction; when the work is turned round, each of these angles makes its own track; and these tracks, when the work has not been very carefully put in, do not correspond with one another, and so form double or confused threads and spoil it. Another important defect of dies which do not cut easily and clean, is that the great pressure necessarily applied tends to force out and elongate the work in different degrees according to its hardness or softness, or its ductility. It is owing to this effect, produced more or less by almost every process of making screws, that artists find so much difficulty in making them, so that different portions containing equal numbers of threads, shall be truly equal in length to one another, and the more strain is applied in forming the thread, the greater will be the defects arising from this cause.

Every workman is aware that a half-round opening bit with a gentle taper cuts cleaner, and with the application of less force than any other form of Broache. If the back and edges of such a bit therefore were indented with a screwed thread, we should have the best form of a tap, and instead of bruising a thread into the solid as usually done, we should with such a tap cut one clean out with a smaller effort. For this purpose I would beg leave to recommend the following process for making a good tap, representations of which are shewn in Plate VIII.

First, Prepare a plug of steel by turning it into a true cylinder of the diameter required, and form the head and neck in the usual way; then by the best means in your power have it screwed to a regular full thread from end to end, being very careful that the diameter of the bottoms of the threads at the neck end be not greater than those towards the point.

Second, Turn off the threads from a portion at the point of the tap, (say equal in length to half the diameter of the original cylinder,) in doing this leave a *slight trace* at the bottom of the thread, then set the slide rest of the lathe at such an angle that you may cut away a part of the thread all the way from *a*, to *b*, (figs 1 and 2,) beginning at *a*, by merely touching the surface, and cutting deeper and deeper to *b*, when the cut should coincide with the cylindrical portion previously laid bare at *c*.

Third, When this is done, make the spindle of the lathe fast, so that it shall not turn round, and proceed to file off a portion like that marked *d*; fig. 1, this portion should be *very nearly* half the cylinder, excepting at the two extremities of the cut, where it should be left as in the sketch, in order to prevent a failure in the process of hardening. For the same reason when the taps are of a large size, and of cast steel, it may be prudent to begin the work by drilling a hole of some size as far into the point *c*, so as to form an opening through it when the portion *d*, is filed away. (see fig. 2.)

In fig. 1, the finished lines shew the appearance of the tap when completed, and the dots shew what is to be turned or filed off, fig. 2, is the same in perspective.

The form which I should recommend for dies is represented in figs 3 and 4.

In preparing them the parts *a*, and *b*, being brought into contact, and the cylindrical opening made to the guage of *c*, (figs. 1 and 2,) a perfect thread is to be made in it, the part *a*, is then to be separated, and two portions of the thread as at *b*, *b*, to be filed away, (leaving it entire at *a*,) so that a solid cylinder of the proper diameter for such a screw would *bed fairly on the whole surface* *b*, *a*, *b*, as represented in fig. 4, the dies should then be hardened.

In using dies prepared in this way, the work will never exhibit the double or confused thread, as the position it will be forced to assume by the blunt surface *b*, *a*, *b*, will be a true one, and the single cutting edge of the die *b*, at *c*, will make its track in a regular direction. When the edges at *c*, get blunt by use, they may be whetted on the stone either at the original angle, or (for some kinds of work,) at an angle like *d*, *c*. The die *a*, is in no case intended to cut, but is merely to serve as a guide.

If the dies be thick, there should not be more than a few threads left in *b*, and these should be in the middle of its thickness ; in *a*, on the other hand, the thicker it is, and the more threads it has, the better it will serve as a guide.

With taps and dies so prepared, work may be executed with a degree of accuracy hardly obtainable by the ordinary methods, and it will be found on applying them, that much less force is required, and the matter cut out, will come away more like the cuttings made by a turning tool, than the particles abraded by a file ; the work also will be much less strained, and the thread sounder and better defined.

I am, GENTLEMEN,

Your very obedient Servant,

JOHN ROBINSON.

Athole Crescent, Edinburgh, 18th June, 1828.

Mr. R— on street lamps is received with thanks, and will be considered before the publication of our next. The information communicated in the postscript would more be deemed by us as a drawback upon any work of merit, and we have reason to know that many such have been involved in similar circumstances.

EDITOR.

ART. XVII.—DESCRIPTION OF A MACHINE FOR CUTTING THE EDGES OF PAPER, CARDS, &c. WITH VERY GREAT ACCURACY AS TO SQUARENESS, AND EXACT CORRESPONDANCE OF SIZE; EMPLOYED FOR CUTTING THE SHEETS OF PAPER FOR BANK NOTES, AND ALSO CALCULATED FOR CUTTING CARDS OF BUSINESS, PLAYING CARDS, AND A VARIETY OF OTHER PURPOSES. INVENTED BY JOHN OLDHAM, ESQ. OF THE BANK OF IRELAND.

To the Editors of the London Journal of Arts, &c.

GENTLEMEN.—The enclosed packet contains drawings and descriptions of my cutting press, for insertion in your Journal, upon a scale of about 16th of an inch to the foot, the size I have it made, but that may of course be larger or smaller as required for the various purposes to which it may be applied. I consider it is generally applicable to the cutting of paper, cards, and pasteboard perfectly square, and in parallelograms of uniform dimensions. All kinds of Veneer woods in various forms, whether in parrallel bands, triangular, square, or polygonal pieces, may by means of this machine, be cut out geometrically through several layers; and the same with respect to cloth, leather, and sheet metals. This machine, I have found by the experience of several years, to be very valuable to me in the Bank establishment, occasionally cutting the above substances with it, and in the hope that it will prove equally so to those of your readers who may feel disposed to try it, I most respectfully beg leave to offer the invention for their use.

In Plate VIII, fig 6, represents an end elevation of the machine. Fig. 7, a side view of the same, the letters of reference indicating the same parts of the machine in each of the figures.

a, is the top cross bar with rectangular grooves *b*, *b*; *c*, *c*, side posts; *d*, *d*, cross feet to the same, with strengthening brackets; *e*, *e*, a square box, in which the press stands, for holding waste cuttings. Fig. 8, is a cross section of the upright posts, *c*, *c*, taken horizontally. There are rectangular grooves in the upright posts, for the projecting ends of the cast iron cross bracket *f*, to slide up and down in. In the middle of the underside of this piece *f*, there is a boss, within which is a round recess, to receive the top of screw *g*, which works in the cast iron cross piece *h*, similarly made with the former, but bolted firmly to the posts *c*, *c*. Upon the screw *g*, there is a circular handle or ring *i*, for partially turning the screw, and immediately over it cross holes for tightening the press by means of a lever bar. Upon the cross piece *f*, is bolted the board *j*, and upon each end of this board is made fast the rabbetted pieces *k*, *k*, for another board *l*, to slide in. Across the middle of this board, and parrallel to the pieces *k*, *k*, the tongue piece *m*, is made fast, which fits into a groove in the bottom of board *l*. A horizontal representation of this is seen at fig. 9, and immediately under this view is also seen an end view of *l*, and *f*, connected together, and a side view of *f*, by itself. In the middle of the board *l*, is a pin for a circular board *n*, to turn upon, and upon this latter board, is placed the "material to be cut," with a saving piece between it and the circular piece which is to be divided upon its edge into any number of parts required, with a stationary index on the board *l*, to point to each.

It will now be understood, that "the material to be cut" may be turned round upon the centre pin of the board *n*, and also that both it and the board can be shifted backward and forward under the top cross piece *a*, and between the side slide slips *k*, *k*, the surfaces of which should also be divided into inches and tenths.

The plough, fig. 10, shewn in several positions, is made to receive two knives or cutters as the "material to be cut" may require, and which are situated in the plough as I now shall describe. The plough is composed of three principal parts, namely, the top and its two sides. The top *o*, is made the breadth of the cross piece *a*, and with a handle made fast thereon. The sides *p*, *p*, are bolted thereto with bolts and nuts through corresponding holes in top and sides. The figures below give inside views and cross sections of the details of the manner the cutters and adjustments are mounted. A groove is cut down each cheek or side, in which are placed screws that are held at top and bottom from moving up and down, but that by turning cause the nuts upon them to do so, and are shewn at *q*, *q*. Those nuts have each a pin projecting inwards that go into plain holes made in the top ends of cutters *r*, *r*. The 10th and following figs. are ¼ in scale.

The cutters and the work for causing them to go up and down, are sunk into the cheeks, so as to be quite level with their inner surfaces. Fig. 11, shews one of those screws apart, how fixed, and with moveable nut and projecting pin. The top of each screw terminates with a round pin split down, and above it a pinion wheel and boss thereon, also similarly split. This pinion fits upon the split pin. Above there is a cross section of a hollow coupling cap, with steel tongue across, that fits into both the cuts of the screw pin and pinion boss, and so that when lowered upon each other must all turn together. In the middle and on the top of the upper piece *o*, the larger wheel *s*, runs loose upon its centre, and works into the two pinion wheels *t*, *t*. The wheel *o*, has mounted upon it a fly nut with wings.

It will now be seen, when the plough is in its place as at fig. 12, that if it be pushed to and fro by the right hand and the nut occasionally turned by the left, the knives or cutters will be protruded downwards at the same time, and these either will or will not advance as the coupling caps, *u*, *u*, are on or off. The ribs *v*, *v*, run in the grooves *b*, *b*, fig. 6, and keep the cutters to their duty, working steadily. The top cross bar *a*, I have made the exact breadth of a bank note, by which means both knives are made to cut at the same time. I also cut the paper uniformly to one length, and accurately square.

By the use of this and my air-pump apparatus and appendant press, the paper of 45,000 notes is fully prepared in one hour and a half by one person, and may then be printed, yet I think it better to let it lie till the following morning. The paper is not so much injured by this process, I have fully ascertained, as by the ordinary method of clipping by hand, soaking it, &c. which more or less opens and weakens the fabric while in this wet or tender state, especially bank note paper. The air pump, &c. and its appendages, I propose giving you drawings of in my next, in hopes that they may also be acceptable.

I remain, yours, very truly,

JOHN OLDHAM.

Bank of Ireland, 11*th June,* 1828.

Art. XVIII.—On the Condensation of Coal Gas.

To the Editors of the London Journal of Arts.

Gentlemen.—Manufacturers of coal gas are not perhaps generally aware how much the process of *condensation*, contributes towards the *purity* of the gas.

Coal gas should not be subjected to the *purifier*, (that is to a vessel containing certain ingredients having an affinity for sulphur) until it has been first thoroughly cooled, or *condensed*, as it is termed, and divested of its tar and other oleaginous particles; and also of its hydro-sulphuret of ammonia. It contains these in great abundance when first evolved, and unless it be well condensed will never get sufficiently rid of them. After being completely diverted of these offensive ingredients by condensation, the gas may then be softly passed through the purifying vessel, to extract the *sulphuratted hydrogen*, and what remains of carbonic acid gas, &c.

The process of *condensation*, however important to the wholesomeness, purity, and even the brilliancy of gas, is still very indifferently understood, and imperfectly executed. In London the mode of condensation generally adopted is merely to pass the gas through tubes, or between plates, which are merely cooled *externately* by means of air or water, *through tubes or plates laying interposed between the gas and the water*. It must be admitted, that, if this method be pursued to a *certain extent*, and at a certain rate of expence for machinery, of course, according to that extent, the tar and other oleaginous particles, as well as a great proportion of the hydro-sulphuret of ammonia *will* be extracted; but it is a fact, which cannot be disputed, that, however expensive the vessels for condensation, (in most of the London gas works even) the condensation process has never yet been carried by any one of them so far as to divest the cooled gas sufficiently of its ammonia, either before or after passing through the purifier, and they must know that it is this very *ammonia*, which when the streets are opened, or a leakage occurs, produces that putrescent effluvia, rendering *imperfectly condensed gas* so extremely offensive, and pernicious.

In the beginning of 1823, Mr. Tait, Civil Engineer, then in charge of the Bow Oil Gas Works, communicated to one of the Directors of the city of London Gas Works, a plan, which he had conceived of bringing the crude gas, *in immediate contact with the cold water, in the condensor;* thus proposing to combine the effect of the *temperature,* not the *chemical affinity,* which it is well known water has for ammonia. The idea was fully appreciated by the scientific gentlemen to whom it was imparted, but not at that time put in execution. In 1825, however, Mr. Tait, having been sent down to Ayr, in Scotland, to erect gas works there, for the British gas company, constructed a *condensor,* on the above mentioned principles. The gas made at Ayr, has been tried by several individuals, (perfectly competent to judge of the purity and quality of carbonetted hydrogen gas, and they have invariably declared *it to be the purest and best gas they have ever seen or examined.* The superiority of the gas here is chiefly ascribed to the effect of the very excellent condensation. At Dalkeith, Mr. Tait has since constructed a similar condensor; but the works there having fallen into an imperfect management, and ignorant hands, cannot of course be referred to, as proving in one way or another.

I am Gentlemen,

Yours, &c.

Edinburgh, 16*th June.* X.

We have been promised a drawing and more minute description of Mr. Tait's improved condensor, (as erected at Dalkeith,) which we shall have much pleasure in submitting to our readers when it arrives. EDITOR.

Art. XIX.—On the Invention of Money and Medals. By Mr. B. Cook.

To the Editors of the London Journal of Arts, &c.

Gentlemen.—Your approval of my former paper on Money and its representatives in Trade and Commerce inserted in the XIth Vol. of the London Journal of Arts, has induced me to present you again with another paper, connected with the same subject.

The study of coins and medals, has been a subject of amusement to me for many years, because, in endeavouring to trace the progress of money, its improvement, and introduction into the different kingdoms of the earth I have found that it exhibits the progress of art and science, and the gradual developement of the powers of the human mind.

The study of money, is the study of the efforts and genius of man. Placed as he was upon the earth, to preserve himself, and to multiply his species, he brought with him into existence an intelligence, capable of supplying his weakness, and enabling him to invent all the sciences and discover all the arts. These marvellous discoveries were the fruit, not of the genius of a few individuals, but of all the master spirits of the earth—not of a single period of time, but the combined wisdom of all ages.

Man, in his progress of improvement, appropriated to himself all nature. Fire became the companion of his labours, and the servant of all his wants—it aided him to work metals into all sorts of figures, and was the mighty spirit that enabled him to create and produce all the works of art. He established his habitation upon the great waters, and in pursuit of knowledge, passed from one extremity of the world to the other. He improved and changed the face of nature—directed vegetation, and subjugated to his use the animals and elements of the earth. But to assist him in all these great undertakings, it was necessary that he should have something to value, something to give to others as a remuneration for assisting him in his labours, and therefore he invented money. In the investigation of this subject, I have been assisted by several learned works, and from which I have occasionally made extracts.

Let us inquire, who were the first inventors of money? and to what nation or people the honour is due of introducing among men a circulating something, to which universal consent has given a value and called it money,—and which, from its extensive influence on mankind, is, in Holy writ, styled the root of all evil? In almost every age, there has been, either a change in the form of money, or a variation in the value attached to it: I therefore cannot but think, that to trace its history from its first introduction upon the earth, will amuse the curious investigator of the actions, the inventions, and pursuits of man in the earliest ages of the world.

There is another powerful incentive to the study of coins and medals, as it will much assist the historian in fixing the period of events; they having almost always been struck to commemorate some great victory—some important occurrence, some era of time, highly interesting to man, which, in continuing this subject, I shall be able satisfactorily to prove, especially when, in a future paper I notice the coins and medals of imperial Rome.

In proof of this assertion that coins and medals are very often illustrative of events, I shall mention a few of the earliest coins of Greece, although it is certain, that the religion of the Greeks, as well as many of the discoveries in science and art attributed to that people, were known ages before the first colonies were planted in that country; yet those arts were there carried to the highest state of perfection, for long before Greece began to erect temples, or even cottages, to shelter its wanderers from the inclemency of the elements, Egypt was covered with cities, temples, and palaces, and the mighty Pyramids lifted up their everlasting heads to the skies—was Egypt, then the cradle of science, or did she not derive from earlier nations her knowledge of the arts, and the principles of her massive architecture?—at what period shall we endeavour to seek, by unrolling the decayed volumes of remotest ages, for the origin of genius and art? Changes have constantly taken place on the earth! Ages, are but instants in the incommensurable duration of time! The life, that nations occupy, are but a few instants of it—before they are lost, and swallowed up in the rolling stream that sweeps away all things before it, into the vast ocean of eternity. Thus empires, kingdoms, and people with the finest and most durable monuments of their genius and art, are overwhelmed, and lost, in the night of the past, and disappear without return—Where are the mighty cities of Ninevah, Babylon and Palmyra?—and where are the people, that once thronged their busy streets?—the shops of the merchants are closed for ever! the palaces of the Princes have disappeared, and the gorgeous temples of the deities they worshipped are swept away from the face of the earth,—what was the money of these cities, that the poor gave in exchange for bread? what was the value of the circulating medium, that passed from hand to hand, to pay the workmen who were employed to erect their magnificent buildings, or to purchase for the great the luxuries of life,—all—all—are lost, except a few coins coroded by time and rust, like the few records that remain of their former glory. And, if I turn to that once powerful and mighty nation, upon whose bosom, there still exists the vasty relics and ruins of its former power and riches, the nation of Cities, Pyramids, Temples, and Gigantic Statues—the country of Memnon, Pharoah and Joseph; and inquire who were those mighty Princes, that collected together so many millions of men, to perform such immense works, and whose genius and knowledge of the arts, enabled them to leave behind them these eternal memorials of their labours?—from whence, and by what means, were these vast stones, that have lain heaped upon each other for so many thousand of years, six hundred feet above the burning sands of the desert, brought to their distinction, and raised to this heighth by means unknown to the present race of man.

For thousands of years, they have remained, silently looking down upon the revolutions, that have desolated the earth; declaring to all ages, as they rolled by them, "the genius that reared us up, inscribed upon us *Immortality*," what was the money that paid those labourers, to enable them to purchase the necessaries of life?—the Historian has not recorded it, any more than the time in which they were built,—was it a money, selected for its peculiar form from among the minerals, shells, or stones of the earth, oblong, or oboliscal like the Belemnite, was it of metals, and what were their shapes and value? and how was it made? and what were the inscriptions upon it? Are not these inquiries worthy, the research of the Philosopher, and the man who seeks to understand, and know, what were the means and genius of the fathers of mankind? But alas! it is almost in vain, that we search in those countries, that once were inhabited by the master spirits of the earth for traces of their ephemeral existence! a few coroded coins, medals, and engraved stones, —mounds of earth, or immense ruins, only remain; while the people and nations that produced them, as records of their power and glory, are passed away. These feeble records will not endure for ever, they are but faintly inscribed in the archives of eternity; yet it is interesting to the mind, to study the first efforts of man—the first dawnings of his mind—the first rays of genius and invention, that, breaking through the dense clouds of ignorance and barbarism, began to create something to value—some monument to rescue his name from oblivion—some worth to remain to future ages, to tell posterity, that he had lived upon the earth: or urged by his wants, and desirous to obtain from his neighbour something he had need of, he gave existence to the first rude coins, and fixed to them a value to barter with, or give in exchange for those articles he needed for the supply of his wants.

Plutarch says, the forms of the first coins, were oboliscal; or according to *Isidore*, that of an arrow; both these ways of representing the same object under different forms, proves, that the earliest coins, of which Isidore speaks, were changed into an oboliscal form at the time of Plutarch. It is certain, that long before they pointed arrows with metals, they used sharp stones, which they called *Belemnites*, or *Stones for Arrows*; and these stones no doubt, were the first money used in their transactions of barter. The same form appears to have been continued when metals were used for money, as we shall show in the prosecution of this inquiry; for we find upon many Greek medals the form of an obelisk, which was an emblem of the sun, as being like a ray of light; and therefore the first moneys of Greece, were called *obulus, obuli*. *Phocian* states, that the Athenian money had on it the figure of an obelisk; this interesting fact shows, that this ancient form was preserved on the money by impressions at the time he refers to. The obelisks represented on the medals of Apolonia, were symbols of Apollo, and used to represent the God who protected it. Athens had for its protector Minerva, and the medals and coins of this city had struck upon them the owl, as a symbol of the Goddess. The symbol of Apollo, as I before stated, was the obelisk, and what is remarkable, had the title of *Monetalis*, as money was under his special protection, it was regarded as sacred. From this cause, in process of time, there was represented on coins and medals, the symbols, the attributes, the heads, or figures of the tutelary divinities of the cities, where the coins were struck, or the portraits of princes, that flattery substituted in their place.

The word *Symbole* of the Greeks, answers to the word *Tessera* of the Latins. Its origin, under the acceptation of this term, was derived from the *Obolus*, which was the earliest, and only mark of the weight, or value of effects exchanged by this means. This mark, became the subject of a law that determined its title; from the word *Nomoster*, it took the name of *Nomisma*, from which the Latin word *Numus*, was derived: but as it was with them the sign of the value of the things, they gave to it the name *Moneta*, from which is derived that of money, so called by us. An ancient coin of Sicily in lead, has for impression two obolu, united at their base, to represent a double *obolus*, with an inscription on it, making it as such, and this practice of writing on money, *was first used in the City of Athens.*

Upon a *Diobolus*, or double obolus, is a Greek inscription, *the Victory of Jupiter*—on another, *the Mother of the Gods*, attributing to these deities, some victory obtained through their interference and protection, and upon a medal of Macedon, is the figure of *Cybele*, with a victory in her hand, with the legend, *Sacred to Victory*, thus returning thanks to the Goddess for advantages obtained through her means—upon another *obolus* is the name of *Artemis*, or Diana, attributing to this Goddess a victory obtained by the City of Syracuse, which was especially under the protection of this Goddess. By the legend upon another obolus, we see it was struck for another victory, and in honour of all the immortal Gods—*Victoria Immortalium*. The Thunder of Jupiter is represented upon it, and specifies that it was the victory *Athenian !*—Syracuse was the only city in Sicily that vanquished the Athenians: yet it obtained over Athens but a single victory, it appears that it was characterised by the name Athenian, because it occasioned the total ruin of the Athenians in Sicily. In fact, the whole of the Athenian army was destroyed, not a single man escaped. They lost on this occasion, Nicias and Demosthenes, that commanded. Never was a victory more interesting, more complete, and memorable, as it delivered Syracuse from the Athenian yoke, and in guaranteeing its liberty, augmented its power and glory.

Solemn thanks were offered to all the gods, and an annual *Fête* was instituted, called *Asinara*, from the place were the battle was gained, thus we see inscribed on all the monuments remaining of this victory, the names of *Athenian* and *Asinara*, it is described by an inscription upon several coins of lead found there, and recording also that public thanks were offered to the gods, for giving them this victory, which put an end to the war. Among the beautiful medals struck at Syracuse, in silver, in commemoration of it there is a very singular one, *Unique*, and invaluable; on one side is the head of *Ceres*, one of the goddess mothers, and on the reverse a figure of victory, mounted on a car drawn by four horses, and on it are marked a representation of the trophies erected near to the river *Asinara*, for the defeat of the Athenians, under these trophies, we read two letters Α Φ, these letters, like those marked on the *Oboli*, I have before mentioned, are the beginning of a word that signifies the Immortals. This exact correspondence of the *Oboli*, and this medal, fix the time when these monuments were erected, as well as the defeat of the Athenians near to the river *Asinara*, in the 4th year of the 91st Olympiad, and 413 years before the Christian Era, we see therefore that even at that period, money of an oboliscal form was in use in Sicily, like that, first introduced among mankind, and of which but few specimens exist at the present day. I have thus in the present paper which as I before stated, I intend only as a preface to a series of papers, on the invention of money, endeavoured to produce a few examples to prove, that the study of coins and medals, would assist the historian in fixing the correct period of many great events that have happened upon the earth, as well as enable him to form an idea, from what states or cities different countries were colonized. In the prosecution of this inquiry, I shall produce examples, to confirm this assertion, especially when I speak of the cities of Greece, and the many, and mighty events, which rose upon the stream of time during the glory of Imperial Rome.

I am, Gentlemen,

Your obedient Servant,

BEN. COOK.

Birmingham, June 17th, 1828.

Recent Patents.

To Robert Wheeler, *of High Wycombe, in the County of Bucks, Brewer, for his having invented or found out an improvement or improvements on, or in refrigerators for Cooling Fluids.*—[Sealed 22nd November, 1827.]

This improved apparatus for cooling brewers' worts or wash for distillers, and also for condensing spirits in place of the ordinary worm tub, is called by the patentee an *Archimedes Condensor, or Refrigerator*, the peculiar novelty of which consists in forming the chambers for the passage of the fluids in spiral channels, winding round a central tube, through which spiral channel, the hot and cold fluids are to be passed in opposite directions.

In Plate IX, fig. 1, represents the external appearance of the refrigerator enclosed in a cylindrical case; fig. 2, the same, one half of the case being removed to shew the form of the apparatus within, and fig. 3, a section cut through the middle of the apparatus perpendicularly for the purpose of displaying the internal figure of the spiral channels.

The apparatus is proposed to be made of sheet copper, tinned on its surface, and is formed by cutting circular pieces of thin copper or segment of circles, and connecting them together by rivits, solder, or by any other convenient means, as coppersmiths usually do. These circular pieces of copper being united one to the other, in the way of a spiral or screw, form the chambers through which the fluids are to pass within, in an ascending or descending enclined plane.

In figs. 2 & 3, *a, a*, is the central tube or standard (of any diameter that may be found convenient) round which the spiral chambers are to be formed; *b*, *b*, are the sides of the outer case, to which the edges of the spiral fits closely, but need not be attached; *c*, *c*, are two of the circular plates of copper, connected together by rivits at the edges, in the manner shewn, or by any other suitable means; *d*, is the chamber, formed by the two sheets of copper, and which is carried round from top to bottom in a spiral or circular enclined plane by a succession of circular plates connected to each other.

The hot fluid is admitted into the spiral chamber *d*, through a trumpet or wide-mouthed tube *e*, at top, and is discharged at bottom by an aperture and cock *f*. The cold water which is to be employed as the cooling material is to be introduced through the pipe *g*, in the centre, from whence discharging itself by a hole at bottom, the cold water occupies the interior of the cylindrical case *b*, and rises in the spiral passage *h*, between the coils of the chamber, until it ascends to the top of the vessel, and then it flows away by a spout *i*, seen in fig. 1.

It will be perceived that the hot fluid enters the apparatus at top, and the cold fluid at bottom, passing each other, by means of which an interchange of temperatures take place through the plates of copper, the cooling fluid passing off at top in a heated state by means of the caloric which it has abstracted from the hot fluid, and the hot fluid passing off through the pipe and cock at bottom, in a very reduced state of temperature, by reason of the caloric which it held having been given out to the cooling fluid.

The patentee says, "I have described this apparatus a made of thin sheets of copper tinned, but do not mean to confine myself to that material as copper without tinning will answer the purpose, or under some circumstances I should make them of pewter, or perhaps tin plate, and for the cooling of some chemical fluids I should make some of earthern or pottery ware. These various materials being worked by different means, I cannot set forth the precise mode of manufacturing my refrigerators therefrom, nor do I confine myself to any particular mode of making the said spiral chamber, but rest my claim of invention solely upon the form of the apparatus, which I call the Archimedes refrigerator.

Though I have described this apparatus as inclosed within a cylindrical case, which forms the sides of the ascending channel, yet I do not at all times employ a case, but close the external parts of that channel by strips of metal soldered or otherwise, attached to the plates.

This apparatus is applicable to the cooling of worts, for brewers, or wash for distillers, and other chemical operations where the cooling of fluid is required. It is also applicable to the condensing of vapours, whether steam or spirituous fluid, and is employed with great advantage in place of the ordinary condensing worm of distillers, and is likewise applicable to steam engines.

The patentee observes the Archimedes Condensor, displays more surface in less space, and consequently has a greater power of cooling and condensing than any inventions hitherto introduced for those purposes.

The extent of coolers and the duration of worts in them will be essentially diminished by the adoption of this refrigerator; and, thus, the risk incidental to coolers in summer, removed; or if space be wanted, and it be desirable to do away coolers entirely, the refrigerator may be so constructed, as to receive and cool the wort, either in an open or close chamber, immediately from the Hop Back. It may, also, be applied with peculiar success to the cleansing, or starting of beer in summer.

When employed as a condensor it is a very advantageous substitute for the worm and tub; and effects a considerable saving of fuel, time, labour and first cost, and a much better spirit, (in consequence of lower condensation) will result from its use. On shipboard it will be found a valuable improvement on the present process of distilling salt water.

The apparatus may be constructed so as to produce an almost perfect transfusion of temperature by employing quantities of cooling fluid, even something less than the quantities to be cooled; but, as this would require a great length of machinery, the proportion of one and a half of cooling, to one of heated liquor, is generally observed for the refrigerator, and rather more than that of twice the volume of spirit for the condensor, when no instructions to the contrary are received. With these proportions the machines are warranted to cool; the refrigerator to four or five degrees above, and the condensor to two degrees above the cooling fluid.

Thus, by causing a remarkable saving of water, compared with other inventions for the purposes stated, they effect a commensurate diminution in the wear and tear of engines, to which is to be added the essential benefit, in many situations, (particularly in the West Indies,) of being able to work with very small quantities of water.

Their compactness is such, that a refrigerator to cool forty barrels per hour, requires only a breadth of four feet; a condensor to work a 2,000 gallons still, a breadth of about three feet; a condensor to work a 30 gallons still, a breadth of about six inches; all other sizes are proportionate, and every size, may be cleaned and repaired with perfect facility.—[*Inrolled May,* 1828.]

To Thomas Otway, *of the Parish of Walsall, in the County of Stafford, Ironmaster, for his Invention of an expedient for Stopping Horses, when Running away with Riders, or in Carriages.*—[Sealed 21st February, 1828.]

The object of the invention is to deprive an unruly or runaway horse of the power of restiveness or running away, by impeding him in his breathing. This is accomplished by producing a pressure upon the nostrils, by drawing a safety rein so as to close them either partially or entirely, and when the object is effected, the pressure is removed by slackening the rein. The invention resembles in appearance, a common nose-band of leather, attached to the head of the bridle, but rather lower than the usual position, as it is fastened by a small chain to the *cheek* of the *bit*, instead of the cheek of the bridle. On each side of the nose-band, opposite the nostrils, a piece of the leather is cut out, leaving an aperture two inches and a half in length, and five eighths of an inch in breadth or thereabouts. In each of these apertures, is fixed a small box or coffer of brass, or iron plated with silver, or other metal, which contains a small iron lever, padded with leather on the part which is to press the nostril, and attached at one end by a joint to a small rod or piece of iron, which latter passes through a hole at the end of the box, and terminates in a loop outside, to which loop the safety rein is attached. The lever and rod lie parallel to each other in the box, until the safety rein is drawn tight, when by that operation the padded end of the lever is thrown out of the box in the inside of the nose-band, and presses the external membrane of the nostrils, and so partially or entirely closes it, as to impede or prevent the animal from breathing; the effect of which will almost instantly be to stop him, if running away, and to control him if restive.

The box contains a spring of steel, which upon slackening, the rein instantly forces the lever back into its place. It is of course material that the posit'on of the nose-band should be exactly opposite to the nostrils, so that the levers shall press them on the right part, and to adjust this properly, the usual ornamental strap which passes down the front of the horses' bridles, is fastened to the nose-band by a buckle, which secures it in the proper situation.

In Plate IX, the apparatus is shewn in several figures. Figure 4, represents a horse's head in profile, with the safety apparatus affixed to the nose-band as at *a*, and the safety rein *b*. Figure 5, exhibits the nose-band upon a larger scale as seen in front; and figure 6, the same as seen edgewise; *a*, *a*, are the boxes affixed to the nose-band or leather strop *b*, *b*, *b*, which boxes contain the levers, springs, and rods, above mentioned. The peculiar construction of this apparatus will be best understood by reference to the section of the box containing the lever, spring, and rod, shewn at fig. 7.

In this last mentioned figure, *c*, is the lever, which turns upon a fulcruum pin *d*, passed through it, and fixed into the sides of the box; *e*, is the tail of the lever, against which the end of a spring *f*, acts for the purpose of shutting the lever down into the box as shewn in this figure; *g*, is the rod sliding through an aperture in the back part of the box. One end of this rod is connected by a joint to the lever towards the tail part, by means of a pin, and the reverse end has a staple or ring *h*, attached to it, to which the safety rein is fastened; *i*, is a small pad of leather attached to the lever, which presses against the horses' nostrils, when the lever is projected outwards.

The apparatus being fitted on the horse by buckling on the nose-band, in the manner shewn at figure 4, when it is required to restrain or to stop the horse, the safety rein *b*, is pulled by the rider with considerable force, which draws out the sliding rods *g*, *g*, and causes the levers with their pads to be projected as shewn in figure 8, and also in the section figure 9.

The effect of thus projecting the levers will be to pinch the nose, and force the pads *i*, *i*, into the cavities in the head through which the air passes from the nostrils for the purpose of respiration.

As soon as the tension of the safety rein is relaxed, the springs within the boxes acting upon the tails of the levers, force them in again, as at figs. 6 and 7, when the animal experiences no further impediment to breathing.

The patentee states in conclusion: "I have exhibited in he drawing which accompanies this, my specification, certain parts of a horses' bridle, made upon the ordinary construction, and to which I lay no claim; but the boxes attached to the nose-band containing the levers, rods, and springs, as herein described, for the purpose of stopping a runaway horse in the manner above explained, being to the best of my knowledge and belief, entirely new, and never before used in this kingdom, I claim the exclusive right to make, use, and vend the same, by virtue of the above recited Letters Patent."—[*Inrolled April*, 1828.]

To GEORGE CLYMER, *of Finsbury Place, in the County of Middlesex, Engineer, for his Invention of an Improvement in Typographic Printing, between plain or flat surfaces.*—[Sealed 6th September, 1827.]

THESE improvements in typographic printing between two plain or flat surfaces, consist in the general arrangement of the parts of a printing machine, or press for taking off impressions from types, blocks, or other like surfaces in relief, by which arrangement the patentee considers that he shall be enabled to print between plain or flat surfaces, sheets of paper of much larger dimensions than have hitherto been printed by means of flat table platens.

By this new contrived press it is proposed to print two forms of double royal paper at one time, being a surface of four feet six inches by three feet three inches, which is twice the size of the largest newspaper at present published.

Plate IX, fig. 10, is a side view of the press; and fig. 11, a front view, in which is represented the new arrangement of the parts; the whole are not, however, claimed as new, taken separately, but only when combined in the way exhibited.

Fig. 10, the side view of the machine, exhibits it with all its appendages complete; but in fig. 11, the front view, some of the parts are omitted, to avoid confusion; *a*, *a*, is called the winter, or base, to which the ribs or brackets are fixed that the table rests upon; *b*, *b*, the table, having a flat surface on the upper side, made of the dimensions stated above; *c*, *c*, is the head or top part of the frame work; and *d*, *d*, *d*, *d*, are the cheeks or side standards, connected at top and bottom, and held fast by straps of iron *e*, *e*, *e*, *e*, secured by keys; *f*, *f*, is the *platen*, suspended by what is called a piston, and perpendicular bar *g*, the upper part of which is secured by gudgeons or trunnion joints to the infinite levers *h* and *i*, the upper of which is held to the head by gudgeons passing through screw boxes or loops.

The infinite levers *h* and *i*, are connected together by a joint at *k*, and to this joint the rod *l*, is attached, which rod is also connected to the crank *m*.

In giving an impression, the handle, or lever *n*, is to be swung outward, which bringing the crank *m*, and the rod *l*, nearly into a straight line, will straighten the joint of the infinite levers, and force down the platen on to the face of the types, in order to give the impression. When the lever *n*, is moved back again into the situation shewn in the side view, the crank *m*, will be thrown up, and the rod *l*, be made to draw back the infinite levers, which raises the platen from the types.

It is to be here observed, that in order to assist the rising of the platen, it is suspended by rods *o*, *o*, to weighted levers *p*, *p*, which balance the platen, and enable it to be worked with very little exertion of the pressman.

The types are to be inked by means of the ordinary kind of elastic inking roller, introduced at the sides of the machine, and while this is doing, (the platen being raised to admit the inking roller) the sheets of paper are to be laid upon the tympan *q*, *q*, which by means of small carriers runs in and out of the press upon the side rails *r*, *r*.

The types being inked, and the sheets of paper properly laid upon the tympan, so as to register, the tympan carriage is now run in, between the table and form of types below, and the platen above; when the lever *n*, being swung outwards as above said, the platen is brought down with very great power, and the impression given.

On the platen rising, the tympan is again run out, and the form being inked for the next impression, another tympan at the opposite end of the press receives the sheet of paper, which is then ready to be run into the press as in the former instance.

The specification concludes by saying, it is only necessary to add, that I do not confine myself to placing the crank shaft as exhibited in the drawing, as it may be in any other situation which might be found convenient and suited to the projecting of the rod; and the impression may be given by either pushing or pulling the joint *k*, of the infinite lever; and lastly that the movement of the crank may be effected by a lever, or by any other means if preferred.—[*Inrolled March*, 1828.]

To EUGINE DE MASNIL, *of Soho Square, in the County of Middlesex, Esq., for his Invention of an Improvement or Improvements on, or additions to, Stringed Musical Instruments.*—[Sealed 1st August, 1827.]

THESE improvements on, or additions to, stringed musical instruments, are described as consisting of a new kind of peg by which the instruments may be tuned. This peg is formed of one single piece, varied in its figure according to the instrument to which it is to be applied. If this peg is to be adapted to a piano-forte or harp, in which it usually turns in one bearing or thickness, the peg must be cylindrical, and terminate in a little cone at the end; if applied to a violin, violoncello, or other instrument in which the peg turns in two bearings, or two thicknesses, then the peg must be in the shape of a cone betwixt two cylinders having the same axis.

The cylindrical part of the peg penetrates into the instrument and the string is attached to the cone. Instead of a cone, a cylinder of small diameter may be used, but the conical form is the best.

One or several circular or spiral grooves are cut in the part of the peg to which the string is attached for the purpose of receiving the string, and of drawing it nearer the center of the peg. The cylinders which penetrate into the instruments are hollow. and formed with a screw on the outside, and the peg is put in action by a turnscrew.

The object of this invention is to afford the greatest facility in coming to the mathematical point of the tone; and to impart to the instrument a tone as perfect as possible, because when the great cylinders are turned round, the strings are drawn in a very small degree.

Plate VIII. fig. 14, represents the peg first described, which is designed to be set in one bearing as in a piano-forte or harp: *a*, is the hollow cylinder formed peg, with a screw on the outside; *b*, is the little cone cut in several spiral and circular grooves. Fig. 15, is an end view of the same. There are four small holes in the end of the peg, for the turnscrew to be passed into, in order to turn it as shewn in the section at fig. 16, and there is a small hole to pass the string through, in securing it to the peg. The length of the pegs are to be about the same as the thickness of the instrument in the parts where they are inserted. In the guitar, the lengths of the pegs need not be so great in proportion.

Fig. 17, shews one of the pegs to be supported in two thicknesses or bearings as in violins, &c.; *a*, and *b*, are the cylindrical parts formed with screws; *c*, is the cone with the spiral and circular groove. Fig. 18, is a section of the last described figure with the turnscrew introduced into the holes, for the purpose of turning the peg. There is a hole in the conical part, for making fast the string to the peg. This proportion is suited for violins; but for violoncellos, and other instruments of different magnitudes, it must be enlarged in proportion.—[*Inrolled February,* 1828.]

To JOHN LEE STEVENS, *of Plymouth, in the County of Devon, Merchant, for a New or Improved Method or Methods of Propelling Vessels, through, or on the water by the aid of Steam, or other means or power, and for its application to other purposes.*—Sealed 18th December, 1827.]

THIS invention is a method of working paddles, for the purpose of propelling vessels on water, by steam, or other power, through the agency of a series of paddles attached to a three throw crank.

Plate X, fig. 1, represents a side elevation of the machinery, as it would appear in a paddle box, when applied to the purpose of propelling; *a*, is the centre of the axis of the triple crank *c*, *c*, *c*; and *b*, is one of the bearings of the said axis, which would be supported on the side frame of the paddle box; *d*, *d*, is one of the longitudinal bars which support the other bearings of the axis of the triple crank; *w*, *w*, are transverse beams to support the ends of the bars *d*, *d*. The dotted lines represent the paddle box; *e*, *e*, *e*, are three sets of paddles, each set being carried and worked by a division of the triple or three throw crank, while the peculiar motion required for the paddles is given by means of the guide rods *f*, *f*, *f*, and the radius rods *g*, *g*, *g*, which radius rods work on a bar or centre at *h*; *i*, *i*, *i*, are spreaders to keep the paddles more steady, and cause them to work firmly.

By this arrangement it will be seen that one set of paddles is always acting against the water, and sometimes two sets at the same time. The parts marked *r*, are the paddles, and are fixed to vertical bars *l*, by hooks and nuts in the ordinary way, the upper ends of the bars *l*, being inserted in sockets cast in the bar, *k*, which is called the paddle carriage. It will of course be necessary to make a provision in the top of the paddle box to allow of the occasional rise of the bars *g*, and *f*, above it, when the paddles are in action.

Fig. 2, represents a plan of the apparatus; *m*, is the shaft from the steam engine or other power communicating motion to the triple crank, it will be seen by this figure that the paddle carriages are hung to each division of the triple crank by two bearings *n*, *n*, in the inner division, *o*, *o*, in the centre division, and *p*, *p*, in the outer division. It will be seen that the three throw crank has four supporting bearings, the inner of which *s*, is fixed to the vessel's side, the outer one *b*, is carried on the frame work of the paddle box, and the two intermediate ones *t*, and *v*, on the stays or longitudinal bars *d*, which are fixed fore and aft to the transverse beams *w*, *w*, or to the frame work of the paddle box, each crank or division of the triple crank carries a paddle or set of paddles; which, with the carriage, works within the arms of the said crank or division of the triple crank.

It will be seen by this drawing, that the bar or beam *h*, extends from the side of the vessel at one end, and is fixed to or in the outer frame of the paddle box at the other end. The circle of motion described by the triple crank is equally divided between each division thereof, so that they nearly balance each other on their mutual and general centre.

This apparatus being driven by the power of steam or any other first mover, causes the three throw crank to revolve, and the paddles in passing through the water to propel the vessel forward.—[*Inrolled June*, 1828.]

To JOHN CHARLES SCHWIESO, *of Regent Street, in the County of Middlesex, Musical Instrument Maker, for his Invention of Improvements on certain stringed Musical Instruments.*—[Sealed 22nd August, 1826.]

THESE improvements consist of three particulars. 1st, Connecting each of the tension forks, in the head of a harp which act upon the *natural* strings to springs placed over the top, for the purpose of steadying the forks, and keeping them from jarring when the strings are touched. 2nd, Attaching springs to the back parts of the axles or pins of the forks, which belong to the *sharp* strings, in order to press them to open, and operate against the pedal action. 3rdly, Placing screws in a frame in any situation between the ends of the strings, and the first bridge of a piano-forte or other such instrument, which screws are intended to act upon the strings for the purpose of regulating the tension, that is tuning with very minute accuracy.

The methods of adapting these contrivances, and their forms, may of course be varied according to circumstances, it is therefore unnecessary to exhibit figures representing them, as the intention must be obvious, and the particular mode of carrying it into effect, would in a great measure be subject to the judgment of the workmen.

By these means the patentee considers the tones of such harps, piano-fortes, and other stringed musical instruments, as the contrivances may be adapted to, will be greatly improved. Other advantages will also arise which are not explained.—[*Inrolled February*, 1827.]

To Peter Mackay, *of Great Union Street, Borough Road, in the County of Surrey, Gentleman, in consequence of a communication made to him by a foreigner residing abroad, for an Invention of certain Improvements by which the names of Streets, and other inscriptions will be rendered more durable and conspicuous.* [Sealed 13th December, 1826.]

The subject of this patent is enamelling letters on glass, which being put together, and made fast in a frame, are to be employed for out of doors inscriptions, such as the names of streets, in situations exposed to the weather.

The method of making the letters as proposed by the patentee, is this :—Take pieces of common window glass, and having carefully cleaned their surfaces, paint upon them the required letters in enamel colour, using if necessary a drawing at the back of the glass, or a metal letter as a pattern. If, by the spreading of the colour, the shape of the letter when so painted is inaccurate, that is, too thick in parts, the paint must be carefully scraped off from the glass in those parts, and the glass wiped very clean.

The painted glass may then be burned or baked in an oven as usual, to fix the enamel, and must be allowed to remain in the oven or kiln until cold, when the back of the glass must be varnished or otherwise covered with a dark coloured material, in order to render the white letter conspicuous.

The pieces of glass with the letters so prepared being now cut square, may be put together in a slight iron frame, and formed into words, the letters being secured therein by means of cement or mastic.

Names or other inscriptions so formed being fixed up at the corners of streets, will be found to be very much more conspicuous and durable than those painted in the ordinary way.

The patentee observes, that he is aware letters have been enamelled on glass before, but claims as his invention the employment of such enamelled letters for the inscriptions at the corners of streets, and other exposed situations.—[*Inrolled June*, 1827.]

To JOSEPH CLISELD DANIELL, *of Stoke, in the County of Wilts, Clothier, for his Invention of certain Improvements in Preparing Wire Cards, for Dressing Woollen and other Cloths.* [Sealed 8th June, 1828.]

THIS improvement in wire cards is designed to render them more fit for the dressing of cloths than wire cards of the ordinary kind, the patentee proposing to employ them in the gig machinery as a substitute for teasles.

The wires for making these improved cards, are of two kinds; first, slender wires with sharp hooked points standing out for the purpose of penetrating into the cloth as it passes, and drawing out the fine ends of wool which are to constitute the pile: second, a stiffer sort of wire with blunt points standing a little below the former which are designed to protect the cloth, and prevent its surface being too much disturbed and injured under the operation of the machine.

The ordinary construction of wire cards are so well understood that the above description it is presumed will be perfectly intelligible, it is only necessary to add that the same improved cards are proposed to be employed for hand dressing, as well as adapted to the gig barrel, and in that case, it is advisable to place three or four rows of the stiff protecting wires in the front part of the card to prevent the points penetrating too far into the cloth.—[*Inrolled December*, 1827.]

To Joseph Frederick Ledsom, *of Birmingham, in the County of Warwick, Merchant, for his having Invented an improvement for Purifying Coal Gas, by means not hitherto used for that purpose.*—[Sealed 2nd March, 1827.]

In the thirteenth Volume of the first series of our Journal, we gave a sketch of the process proposed to be employed by the patentee in purifying coal gas; we have now the Specification before us, and therefore are enabled to describe the improvement with more exactness.

A quantity of the ammonical liquor obtained from distillation of coal is to be converted into muriate of ammonia by saturating it with muriatic acid. When this has been done, the liquor is to be evaporated, and the salt reduced to a state of crystallization. The crystals are then to be dissolved in water, and lime added to the liquor, in the proportion of fifty pounds of lime to one hundred pounds of muriate of ammonia.

The gas passed off from the retort in the process of distillation having been conducted through water for the purpose of cooling it, and separating the tar, is now to be passed through this liquor, when the sulphuretted hydrogen which it contains uniting with the ammonia, for which it has a great affinity, becomes soluble in the water, and remains principally in the purifyer.

But if any portion of the sulphuretted hydrogen happens to pass over, it is arrested by another vessel of water containing the mixture above described.

When the muriate of ammonia in the liquor has become spent, the liquor is to be drawn off from the purifier, and a fresh supply introduced, and the spent liquor may be restored by another quantity of muriatic acid.

The patentee says, that he sometimes employs sulphate of ammonia, which may be made by saturating the liquor with sulphuric acid, or by gypsum, and when sulphate of ammonia is used, it is necessary to add to it magnesian lime instead of common lime, by which means after the liquor is taken from the purifyer, beside ammonia, a quantity of sulphate of magnesia is obtained.—[*Inrolled September*, 1827.]

To JOHN GEORGE CHRIST, *of the Old City Chambers, Bishopgate Street Within, in the City of London, Gentleman, in consequence of a communication made to him by a certain Foreigner residing Abroad, for certain Improvements in copper and other Plate Printing.*---[Sealed 14th February, 1827.]

THIS is a contrivance by which the impressions taken from copper-plates upon paper or card are made to resemble enamel. The paper is to be prepared with a coating of white lead mixed with size made from parchment cuttings, isinglass, and gum-arabic.

The size being prepared, a quantity of white lead finely ground is to be mixed with it, when the size is in a milk warm state, and the composition being about as thick as new milk, is to be laid on the face of the paper or card with a brush.

It will be necessary to lay several coats of the composition upon the paper or card, in order to give a substance, and between each coat the material must be allowed to dry perfectly.

The prepared papers or cards are then ready to be printed in the ordinary way, and will receive a much more perfect impression of the plate, than paper without such preparation could do, and after the printing ink has become hard, the printed papers or cards are to be passed several times through a roller press, with a cast iron bed, the face of the print being laid upon a plate of polished steel, which operation gives a finishing glazing to the paper or card.

If it is required that the papers or cards should be tinted the colour must be ground with the white lead before mixing with the size, and in printing with gold, silver, or colours, the same mode of mixing those materials, as a printing ink, must be resorted to, as is usually adopted in printing in colours.—[*Inrolled August*, 1827.]

New Scientific Books.

Mexican Illustrations for 1825, 1826, *and* 1827. *By* M. Beaufoy. 1 *vol.* 8*vo.*

This is a book of considerable merit in a scientific point of view, though its numerous details of a country that may not unaptly be called "the schemer's purgatory," can hardly find a place in our pages. We notice it principally to furnish our readers with a condensed account of Mexican mining, which is usually but little understood. The veins of silver were no doubt originally discovered by fires being accidentally lighted on spots where the ore "cropped out" on the surface; and some portion of metal thus became smelted and seen; adventurers then began to sink a shaft; or, much more commonly, to dig a hole in the vein itself, following the richer lodes in all their sinuosities, groping about, sometimes above, sometimes below, but leaving nothing behind that was worth taking away.

If the shaft is perpendicular, a large wooden drum, turned by horses, raises the ore to the surface in a sort of sack made of three great skins, and filled with water; for the use and mode of making tubs with staves is utterly unknown, and there are very few mines which have a level depth enough to drain a third part of their galleries. While this is going forward, the carriers work their way to the surface by means of notched poles put across a part of the shaft in a zigzag direction, and they then give their load to the breakers, who knock the ore into pieces, exactly as if they were going to macadamize a road.

The quantity brought "to grass" by each individual would appear ridiculously small to to those who are unacquainted with the difficulties of the low under-ground passages, and the fatigue of mounting several hundred feet of notched sticks; but it is the long-established usage of the natives, and can only be got rid of by degrees, even in those mines where the shafts will allow a bucket.

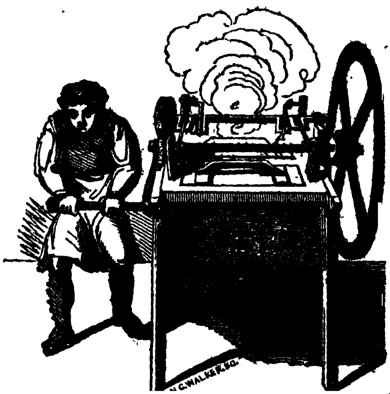
At the manufactory, the ore is ground, or else pounded very fine under stampers, and then placed in a large open space, most frequently open to the weather, but preferable if covered from the rain and cold; it is there wetted, and mixed with certain proportions of salt and burnt pyrites, which vary in quantity on every occasion, and can only be known by long experience. This mud, which strongly resembles the scrapings of London Streets, is well trodden and mixed together by men or horses; quicksilver is then squeezed through a fine cloth all over the heap, and the mass is again turned over, and kicked about for a long succession of days. Thus, according to circumstances, the state of the atmosphere, and various other causes, the mud remains from three to six weeks before it is fit to be washed; then it is put into a cistern of water, well stirred up, and allowed to run very gently down a long inclined plane or trough. The quicksilver having united itself with the minute particles of precious metal, they are together heavy enough to sink, and collect at the stops on the board, while the refuse dirt is carried off with the water. As the great mass of native Mexican mine proprietors have not manufactories of their own, they are obliged to send there ore to be amalgamated by other persons, paying them a fixed sum for a given quantity, and all additional expenses of salt, pyrites, and mercury.

Novel Inventions.

Improved Washing Machine, by Mr. Fryer.

[This article came too late for insertion amongst the Orig'nal Communications]

Gentlemen,—The favourable reception which my former communication met with from you, has encouraged me to offer for publication a description of another very important improvement or invention by me, of a valuable domestic machine for the purpose of washing every kind of linen, of greater and more extensive use in my opinion, than any other machine of the kind in the world. I am aware that several machines have been constructed for the purpose of more expeditiously washing of linen, but either through the hard labour required to work them, or their damaging the linen by their improper construction, they have proved of very little benefit to the public. Another great deficiency in these machines is their not being adapted to wash different kinds of linen at the same time, which together with the above objections have created so great a prejudice against all machinery for washing of linen, that it would seem little short of a miracle is necessary to counteract this deep rooted prejudice, and supersede the long antiquated custom of rubbing the cloth to pieces by the hands.



My machine, as annexed, consists of two separate compartments, placed side by side, nearly close to each other; in the centre of each is fixed a paddle running freely on brass bearings. Exactly over the space between the two compartments is an arbor of cast iron, to the one end of which is fixed a pinion of 12 cogs, and furnished with a fly wheel; at the other end is a handle by which the machine is turned; exactly over this bar is a double crank with a wheel of 30 cogs, which is acted upon by the small pinion. From the crank to the paddle post are attached link bars, which give motion to the paddles, which alternately press from side to side, forcing the water through the linen and over the top of the paddle, like a water-fall, dashing down upon the linen which have just been pressed, thus alternately moving from side to side at the rate of from 25 to 30 times a minute. The crank is so constructed that the two paddles cannot press at the same time. To this machine may be attached as many other compartments as may be required to such large establishments, or to wash fine linen and coarse coloured linen and flannels all at the same time. By this means one person can wash from 10 to 100 shirts in half an hour, they being first soaped and put into the machine with the water (the soap-ing of which may be done in 3 or 4 minutes to each shirt) or the same proportion of any other kind of linen whatever. Many other advantages might be here enumerated, such as its portability and compactness, and the extreme lightness with which it works. It may be turned by any boy or unexperienced person, and the linen cannot in this as in other machines, be slighted, for if the handle is turned round, the linen must have its proper degree of pressure, and the linen so far from not being got clean as is generally supposed, will never want even seconding; and further, that if the linen is rinced in two waters, even the boiling may be dispensed with, and the linen, notwithstanding be of a better colour than when washed by the hands, as is respectfully attested by several disinterested persons, who, I am proud to say, have honoured me with their patronage and approbation.*

Yours, &c. R. FRYER.

18, *Pitfield Street, Hoxton.*

New Royal Filter.

THIS ingenious and simple apparatus is now exciting universal attention.

The following will stand conspicuous among its advantages. 1st, its moderate price, which renders it attainable by all classes of society; 2nd, the rapidity and perfection of the process of filtration; and, 3d, because families will not be left at the mercy of their servants, who, frequently (to avoid the trouble of repeatedly charging a Filter,) would employ the unfiltered water in the culinary

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* We have seen a series of written communications to Mr. Fryer, from persons who have purchased the machine, all speaking in the highest terms of its utility.—EDITORS.

department, to which may be added, the absolute impossibility of any inconvenience arising from the accidental omission of charging the filter, which repeatedly happens in those of the ordinary construction.

The materials employed in the construction of this filter are, sand, charcoal, and large masses of silica, and in this respect it does not differ very materially from the filters usually constructed; but in the arrangement of the box intended to receive the materials, a very great and important improvement is effected.

The value of some such apparatus as the above, will be at once apparent to any person who has perused the account of the water supplied to this metropolis, and we need only inform our readers that the proprietors are Messrs. Robins and Company of the Strand.

Vaziès Steam Boilers.

THE application of science to domestic economy, has hitherto formed a distinguished feature in our Journal, and as honest chroniclers of the progress of useful knowledge, we feel it our duty to call public attention to this very unassuming but useful piece of culinary apparatus. We can estimate its value by the best of all tests, actual experience, and have no hesitation in recommending it to our readers, in those cases where the larger and more expensive steam boilers for kitchens are not resorted to.

Polytechnic and Scientific Intelligence.

ASTRONOMICAL SOCIETY OF LONDON.

May 9*th*. A paper was read before the Society, entitled " Approximate places of double stars in the Southern Hemisphere, for 1827, as observed at Paramatta, N. S. Wales. By Mr. James Dunlop."

After the departure of Sir T. M. Brisbane from the Colony of New South Wales, the author, finding himself in the possession of reflecting telescopes capable of adding considerably to our knowledge of the nebulæ and double stars of that portion, resolved to remain, for the purpose of making a general survey of the heavens, from the south pole to 30° of south declination. The daık nights in the absence of the moon were devoted to observations of the nebulæ, and the moonlight to those of double stars, of which however only a part could be subjected to exact micrometrical measurement. The apparatus employed for this purpose consisted of a 46-inch achromatic telescope, equatorially mounted, and furnished with two micrometers;—one a parallel line micrometer, the author's own workmanship; the other, a double image micrometer, on Amici's principle. Those which could not be micrometrically measured, had their positions and distances noted by estimation while passing the field of the 9-feet reflector, with which they were discovered in the sweeps for nebulæ, and their places are given as determined in the sweeps.

The author prefaces his catalogue with the details of the micrometrical measures of about 30 principal Southern double stars, the most remarkable of which are α *Crucis* and α *Centauri*, the former bearing a great resemblance, both in the magnitudes and the mutual distance of its individuals, to *Castor*; the latter being a star of the first magnitude, accompanied by one of the fourth, at about 20" distance—a remarkable combination, such as does not occur in our hemisphere.

A catalogue of 254 double stars arranged in order of right ascension follows, in which the right ascension to seconds of time, and declination to the nearest minute of space,—the position, quadrant distance, the differences of right ascension and declination when observed, and the magnitudes, are set down in separate columns. They comprise double stars of all classes and of every variety, One very remarkable is the star 1 k *Argus*, AR 8^h 4^m, declin. 42° 7', which consist of individuals of the sixth and eighth magnitudes, the large star being blue, and the small one dusky red. This affords almost the only instance known of a combination of two considerably bright stars differing decidedly in magnitudes, where a marked excess of the less refrangible rays enters into the composition of the light of the smaller star, and of the more refrangible into that of the larger. Among the double stars is set down also one of the seventh magnitude, right ascension 1^h 19^m 43^s, declin. 33° 31', of that singular deep red purple colour of which examples are not wanting in our own hemisphere.

An extract of a letter was read from Professor Harding, of Gottingen, to Dr. Tiarks, in which he alludes to a phænomenon that had recently been observed by several astronomers on the continent, relative to an inequality of the dark space between the body of Saturn and its ring. This appearance was first noticed by M. Schwabe on December 21, 1827, and has since been confirmed by several persons to whom M. Harding had communicated the circumstance. It seems that the space on the eastern side of the planet appears larger than the space on the western side. M. Harding was at first inclined to treat the whole as an optical deception, till the fact was confirmed by others, when he was induced to attempt an explanation of the phænomenon. He endeavoured to account for it by the present position of Saturn, but the result of his calculation proved that that cause would not increase the space (in March) more than $\frac{1}{89}$; a quantity probably too small to become perceptible to the eye. He indeed imagined that the appearance might be caused by the shadow of the body, which at present falls much beyond the south-eastern part of the ring, and which might render it impossible to perceive the equality of the two spaces. But this, he says, is disproved by the observation of M. Schwabe, who saw the same phenomenon on the 31st December, three weeks before the opposition, when the shadow was on the western side, and could be but faintly discerned. M. Harding is unable to explain it as an optical deception, and yet cannot consider it in any other light at present. Actual measurement, he says, can alone decide the question. He has already written to M. Struve to take some measures with his powerful telescope, and he requests that this communication may, with the the same view, be forwarded to Messrs. Herschel and South, who have the best means, in this country, of determining this singular phænomenon.

Mr. South then read a note, which he had annexed to the above communication, stating, that in compliance with M. Harding's wishes, Mr. Herschel and himself had directed their attention to Saturn, but that they did not detect any inequality in the two spaces above alluded to, by means of micrometers attached to his 5-feet equatorial. The mean of 25 measures, taken on April 26, April 29, and May 8, gave the preceding (or western) space 3''·532; and the following (or eastern) space 3''·607. At the same time he remarks that the mean of 20 measures taken on April 26 (viz. 10 by Mr. Herschel and 10 by himself) gave the spaces precisely the same, each being 3''·472. Mr. Herschel's measures gave the preceding (or western) space 3''·612; and the following (or eastern) space 3''·442 whilst his own gave the former $3''\cdot 331$, and the latter $3''\cdot 502$. Mr. South adds, however, that Mr. Herschel, after a careful examination, thought that, beyond all doubt, the following (or eastern) space appeared the larger: and it is a remarkable fact, that of seven persons who were present in Mr. South's observatory, shortly afterwards and who successively viewed Saturn through his 5-feet equatorial, six of them gave it as their opinion that the apparent right (or eastern) space was the larger: whilst the observer declared he could not distinguish any difference. The situation, however, of Saturn was so low, as to render most of these observations far from satisfactory.

M. Harding also alludes in his letter to the re-appearance of the variable star in the constellation *Serpens*, mentioned in No. 5, of the Society's monthly notices. He says, it is now again become visible, and has already attained the 8th or 9th magnitude. Its position for the beginning of this year is

$$AR = 15^h\,46^m\,45^s \quad \text{Decl.} = +\,15^\circ\,39'\,30''$$

and he invites astronomers to watch this star during this period of its changes.

A communication was then read from Mr. Rumker of the observatory at Paramatta in New South Wales, giving an account of his observations for determining the absolute length of the pendulum vibrating seconds there, according to Borda's method. The apparatus with which these experiments were made, was constructed by Fortin, of Paris, and taken out to the colony by Sir Thomas Brisbane. There are some slight alterations from the apparatus described by M. Biot, which are pointed out by Mr. Rumker: and he also alludes to a new method of observing the coincidences. In Borda's method the coincidence is determined by the intersection of the wire of the pendulum of experiment with a cross marked on the bob of the pendulum of the clock. In lieu of this cross, Mr. Rumker placed a small graduated ark, and the determination of the coincidence resolves itself into observing the moment when the wire describes its minimum amplitude on the arc. Mr. Rumker likewise adopts a new mode of determining the correction for the arc of vibration, he finds that in large arcs (such as 8 or 9 degrees, to which his arcs sometimes extend) the decrease is not in a geometrical progression. When the times are in arithmetical progression. He has therefore formed a table of the actual decrease of the arcs as observed by himself, at equal intervals of five minutes each; and given the corresponding corrections for each interval. In the course of his reductions he notices some errors in the formula given by M. Biot for finding the centre of oscillation of a pendulum constructed according to the methods of Borda. The mean of 41 series of experiments gives the length of the pendulum, vibrating seconds in Paramatta, *in vacuo*, at the freezing point, and at the level of the sea, equal to 992·412801 millimetres, or 30·071618 English inches.

Water Companies.

THE supply of water for domestic purposes is too important a subject to be passed over lightly by those who regard the medical police of the metropolis. The report that has just been furnished by the Parliamentary Commissioners is however too extensive for our pages, and we must content ourselves with a review of the most important features.

For the whole population on both sides of the Thames there are eight water companies, all of whom, with the exception of two, take their supply from the Thames, though under different circumstances, some of them taking it up more, and some less pure ; some of them purifying it in cisterns, ere they send out to the public, and others not.

The *New River Company* gets its supply chiefly from the spring at Chadwell, between Hertford aed Ware. It comes in an open channel of about forty miles in length, to reservoirs at Clerkenwell, which, the town having now stretched completely round it, must receive a considerable quantity of charcoal, coal tar, and ammonia, from the smoke and other impurities. There are two reservoirs having between them a surface of about five acres, and an average depth of ten feet. These reservoirs are eighty four feet and a half above low water mark in the Thames, and by means of steam engines and a stand-pipe, an additional height of sixty feet can be given to the water, so that all the mains belonging to this company are kept full by a considerable pressure of water. The highest service given by the New River, is the cistern on the top of Covent Garden Theatre. The aqueduct by which the water is brought has but little fall, thus it wastes by evaporation during the draught of summer, and is impeded by frost in the winter. At these times, the company pump an additional supply from the Thames, at Broken Wharf, between the Blackfriars and Southwark bridges. To this, however, they seldom have recourse, and their engine, which they have erected only since the works at London Bridge were broken down, has worked only 176 hours in the year. The New River Company supply 66,600 houses with water ,at an average of about 1,100 hogsheads each in the year, or in all about seventy five millions of hogsheads annually.

The East London Water Works are situated at Old Ford, on the river Lea, about 3 miles from the Thames, and a little below the point to which the tide flows up the Lea. By the act of parliament, this company must take its water when the tide runs up, and the mills below have ceased working. The water is pumped into reservoirs, and allowed to settle, and a supply of 6,000,000 gallons is daily distributed to about 42,000 houses. This Company supplies no water at a greater elevation than thirty feet, and the usual height at which the delivery is made to the tenants, is six feet above the pavement; they have 200 miles of iron pipes, which in some places cost them seven guineas a yard.

Thisand the New River are the only companies which do not draw their supply of water entirely from the Thames. The portion of Thames water drawn by the latter company with their engine at Broken Wharf, is ascertained, but there is no evidence as to the quantity of Thames water that may be in the flood-tide of the Lea, although the probability is, that there is very little, if any at all, as the damming up of the Lea is probably sufficient to produce the rise.

The West Middlesex derive their supply of water from the Thames, at the upper end of Hammersmith, about nine miles and a half above London Bridge, and were the bed of the Thames is gravel. The water is forced by engines to a reservoir at Kensington, 309 feet long, 123 wide, and 20 deep, paved and lined with bricks, and elevated about 120 feet above low water in the Thames. They have another reservoir on Little Primrose Hill, about 70 feet higher, and containing 88,000 hogsheads of water, under the pressure of which the pipes are kept charged, in case of fires. They serve about 15,000 tenants, and the average daily supply is about 2,250,000 gallons.

The *Chelsea Water Works* derive their supply from the Thames about a quarter of a mile east of Chelsea Hospital, and they have two reservoirs, one in the Green Park, and another in Hyde Park; the former having an elevation of 44 feet, and the latter of 70. These reservoirs have never been cleaned, nor is any preparation made for that purpose in their construction. About one third of the water served out by this company is allowed to settle in these reservoirs, and the remaining two thirds are sent directly from the Thames. Latterly, however, the company have been making preparations for filtering the water, and also for allowing it to settle in reservoirs at Chelsea, before it is delivered in the mains. The Chelsea company serve about 12,400 houses, and the average daily supply is 1,760,000 gallons.

The *Grand Junction Company* derive the whole of their supply from the Thames immediately adjoining Chelsea Hospital; thence it is pumped without any filtration or settling, into three reservoirs at Paddington. These reservoirs are about 71, 86, and 92 feet above the high water mark in the Thames; their united contents is 19,355,840 gallons; and by means of a stand-pipe, the water is forced to the height of 147 feet, or about 61 feet above the average reservoir; the number of houses supplied by the Grand Junction Company is 7,700, and the average daily supply is about 2,800,000 gallons. These five companies supply the whole of London and its environs north of the Thames; while the buildings and works south of the river are supplied by the three following:—

The *Lambeth Company* takes its supply from the Thames between Westminster and Waterloo Bridges. It is drawn from the bed of the river by a suction pipe, and delivered to the tenants without being allowed to subside,—there being only a cistern of 400 barrels at the works, as a temporary supply, until the engines can be started. The greatest height to which this company forces water is about 40 feet, the number of houses they supply is 16,000, and the average service is 1,224,000 gallons daily.

The *South London*, or Vauxhall Company take their supply from the river Thames, by a tunnel, which is laid 6 feet below low water mark, and as far into the river as the third arch of Vauxhall bridge. At that particular place, the bed of the Thames is described as being always clean, and without any of those depositations of mud, and more offensive substances that are found in many other places. Besides the greater purity of the bed of the Thames here than were any other company on the south side takes its supply, the company allow the water to settle in reservoirs. The Vauxhall company supply about 10,000 houses with about 1,000,000 gallons of water daily.

The Southwark Water Works are supplied from the middle of the Thames below Southwark and London Bridges, and the water thus taken is sent out to the tenants without standing to settle or any filtration, further than what it receives from passing through wire grates, and small holes in metallic plates. The number of houses supplied by these works is about 7,000, and the average daily supply about 720,000 gallons.

The elements of this supply will be better understood, by collecting the results into a table as follows:

Companies.	*Services.*	*Average per Day Gallons.*	*Gallons annually.*	*Aver. per h*
1. New River	67,000	13,000,000	4,056,000,000	182
2. East London	42,000	6,000,000	1,872,000,000	143
3. West Midx.	15,000	2,250,000	702,000,000	150
4. Chelsea	12,400	1,760,000	549,120,000	142
5. Grand Junct.	7,700	2,800,000	873,600,000	363
6. Lambeth	16,000	1,244,000	388,128,000	77
7. South Lond.	10,000	1,000,000	312,000,000	100
8. Southwark	7,000	720,000	224,540,000	102
Total	183,100	28,774,000	9,977,388,000	157

Average per house, north of the river 196 gallons.
Average ditto . . south . . . . 93 gallons.

From this table, it appears that the average supply per house, is more than twice as much on the Middlesex side of the Thames as on the Surrey side, and that the district supplied by the Lambeth Works, does not receive one fifth the quantity which is supplied by the Grand Junction. It is true that in many places of that district, the houses are much smaller than in the other, and it is also true, that not so much is consumed in watering the streets, the supply for that purpose being in some cases taken directly from the Thames, and the watering very imperfectly done in others, but still as the population is very dense, it is possible that these small houses contain upon the average as many human beings each, as the largest houses in other districts. Hence it should seem that either the one district, has an over supply, or that the other has not enough. In cases of fire, too, frequent and serious complaints have been made of the damage that has ensued, from the delay and difficulty of obtaining water. For this latter purpose, it does not appear from the evidence, more especially in the case of the Lambeth works, that there is a sufficient pressure from a head water upon the mains, and we have observed that the plugs are not so often drawn for the purpose of cleaning the pipes on the south side of the river as they are on the north. (The chemical analysis will appear in our next Journal.)

SOCIETY

FOR THE ENCOURAGEMENT OF

Arts, Manufactures, and Commerce.

Adelphi, 2nd June, 1828.

THE Rewards adjudged by the Society, during the past Session, were this day presented to the respective Candidates, by The Right Hon. THE EARL OF RADNOR, VICE PRESIDENT, at the King's Theatre, in the Haymarket, in the following Order: —

In Agriculture.

To Lord Newborough, for planting above 3,700,000 forest trees on his estates in Caernarvonshire and Denbighshire, the large Gold Medal.

To Joseph Houlton, Esq Grove Place, Lisson Grove, for introducing the roots of stachys palustris as an esculent vegetable, the Silver Ceres Medal.

In Chemistry.

To Mr. George Jackson, 30, Church-street, Spitalfields, for his apparatus for instantaneous light, the Silver Isis Medal.

To Mr. T. Cogan, 399, Rotherhithe Wall, for his method of purifying linseed and rape oils, the Silver Isis Medal and £10.

In Mechanics.

To Mr. L. Hebert, 19, Queen-street, Chelsea, for his prepared plumbago to be used instead of oil for chronometers, the Gold Isis Medal.

To Mr. W. Melvine, 22, Ironmonger Lane, Cheapside, for his detached escapement for chronometers, the large Silver Medal.

To Mr. T. Judge, New End, Hampstead, for his self-adjusting pendulum, the large silver medal and £5.

To Mr. R. May, New Road, Deptford, for his watch-escapement, the large silver medal and £5.

To C. H. Ackerley, Lieut. R. N. Plymouth, for his safety rods for ships' boats, the large Silver Medal.

To J. Higgins, Esq. 370, Oxford-street, for his revolving lights for steam-boats, the large silver medal.

To H. W. Hood, Esq. Commr. R. N. for his floating bridge to communicate between a ship and the shore, the large silver medal.

To Mr. J. Castell, 44, Dartmouth-street, for his improved cock for bottling wine, the large silver medal.

To Mr. T. Chapman, 4, Royal-row, Lambeth, for his carriage for Mr Palmer's railway, the Silver Isis Medal and £5.

To Mr. Al. Bain, 7, Broad Court, Long Acre, for his moveable stamps for bookbinders, the Silver Isis Medal and £5.

To Mr. W. Hilton, 10, Regent-street, Pall Mall, for his ladder cane, the large Silver Medal.

To Mr. Jas. Dowie, and Mr. Al. Black, Edinburgh, for their improved machine for the use of boot and shoe makers, two Silver Isis Medals.

To Mr. R. Mottershead, for his expanding piston for high pressure steam-engines, the large silver medal and £20.

To Mr. T. E. Bonner, 38, Tabernacle Walk, Finsbury, for his door lock, the Silver Isis Medal.

To Mr. Jos. Clement, 21, Prospect-place, Southwark, for his improved turning lathe, the Gold Isis Medal.

To Mr. And. Smith, 2, Palace-street, Pimlico, for his lever cramp, the Silver Isis Medal.

To J. P. Holmes, Esq. 21, Old Fish Street, Doctor's Commons, for his obstetrical instruments, the large Gold Medal.

To Mr. C. Gibson, 71, Bishopgate-within, for his spoon for administering medicine, the Silver Isis Medal.

In Polite Arts.---Honorary Class.—Copies.

To Mr. Al. Beaumont, County Fire Office, Regent-street, for a copy in pen and ink of figures, the Silver Isis Medal.

To Mr. W. Price, 46, Warren-street, Fitzroy Square, for a copy in chalk of a head, the Silver Palette.

To Mr. T. Underwood, Colemore, near Birmingham, for a copy in pencil of a landscape, the Silver Isis Medal.

To Mr. R. Finlayson, 45, Upper Baker-street, for a copy in water colours of an historical subject, the large Silver Medal.

To Miss F Burnell, 14, Park-square, Regent's Park, for a copy in chalk of a head, the Silver Palette.

To Miss M. H.Crutwell, 59, Stafford-place, Pimlico, for a copy in chalk of head, the Silver Isis Medal.

To Miss Wiggins, 130, Piccadilly, for a copy in Indian Ink of a landscape, the Silver Isis Medal.

To Miss L. Welby, 100, Guildford-street, for a copy in pencil of a landscape, the Silver Palette.

To Miss L. Corboux, 5, Hercules Buildings, Lambeth, for a copy in chalk of an historical subject, the silver Isis Medal.

To Miss E. Blair, 39, Welbeck-street, for a copy in chalk of an historical subject, the large Silver Medal.

To Miss J. W. Leith, 32, Kenton-street, Brunswick-square, for a copy of a portrait in miniature, the silver Palette.

To Miss B. S. Wiggins, 130, Piccadilly, for a copy in water colours of a landscape, the large Silver medal.

To Miss E. Parker, 19, Great Newport-street, for a copy in water colours of a landscape, the silver Isis medal.

To Miss J. W. Hurlstone, 52, Sloane-street, for a copy of flowers in water colours, the large silver medal.

To Miss Lester, 10, Elm-street, Gray's-Inn-Lane, for a copy of flowers in water colours, the Silver Isis Medal.

To Mr J. W. Moore, 6, Argyll-street, for a copy in pencil of an animal, the Silver Isis Medal.

To Miss Murray, 72, Euston-square, for a copy in oil of a landscape, the large Silver Medal.

To Miss E. A. Dyer, Didmaston, Gloucestershire, for a copy of an historical miniature, the Silver Isis Medal.

Drawings from Busts.

To Miss M. A. Williams, 12, Charlotte-street, Bloomsbury, for a drawing in chalk from a bust, the Silver Palette.

To Miss J. Eggbrecht, 16, Frith-street, Soho, for a drawing in chalk from a bust, the Silver Palette.

Original.

To Miss E. F. Haworth, Barham-wood, Elstree, Herts, for an original historical miniature, the Gold Isis Medal.

To Miss M. Jones, 8, Coleman-street, for an original portrait in miniature, the Gold Isis Medal.

To Miss Mintorn, Woodfield Cottage, Bristol, for an original portrait in miniature, the large Silver Medal.

To Miss Witts, 8, Brunswick-square, for an etching of an animal, the large Silver medal.

To Mrs. Jos. Stannard, St. Giles's, Norwich, for an original oil-painting of dead game, the Gold Isis Medal.

Artists.—Copies.

To Miss Chapman, 106, Great Russell Street, for a copy in water colours of figures, the large Silver Medal.

To Mr. J. H. P. Stubbs, 28, Allsop's-buildings, New-road, for a copy of figures in pen and ink, the Silver Palette.

To Mr. J. Pasmore, 6, Salisbury-court, Fleet-street, for a copy in pencil of a head, the Silver Palette.

To Miss F. Riviere, 8, Cirencester-place, Fitzroy-square, for a copy in chalk of figures, the Silver Isis Medal.

To Mr. Jas. Walsh, 11, New Burlington-street, for a copy in water-colours of figures, the Silver Isis Medal.

To Miss Eliz. Setchell, 23, King-street, Covent Garden, for a copy in chalk of a head, the Silver Isis Medal.

To Miss L. Lyon, 22, Nassau-street, Cavendish-square, for a copy in miniature of a portrait, the large Silver Medal.

To Mr. J. Peake, 26, Clarendon-street, Somers-town, for a copy in Pen and ink of a landscape, the Silver Palette.

To Miss L. Derby, 12, Osnaburgh-street, Portland-place, for a copy in pencil of a landscape, the Silver Isis Medal.

To Miss E. Crabb, Point Pleasant, Wandsworth, for a copy in water colours of a landscape, the Silver Palette.

To Mr. C. F. Du Pasquier, St. James's Palace, for a copy in pencil of animals, the Silver Isis Medal.

To Mr. R. Shaw, 20, Hemmings Row, St. Martin's Lane, for a copy in pencil of animals, the Silver Palette.

Drawings and Paintings from Busts and Statues.

To Mr. E. U. Eddis, 1, Barnsbury-street, Islington, for a drawing in chalk from a bust, the large Silver Medal.

To Mr. C. G. Hill, Queen-street, Golden-square, for a drawing in chalk from a bust, the Silver Isis Medal.

To Mr. J. White, 14, Brownlow-street, Holborn, for a painting from a bust, the large Silver Medal.

To Miss C. Derby, 12, Osnaburgh-street, Portland-place, for a painting in oil from a bust, the Silver Isis Medal.

To Mr. C. W. Cope, 45, Clarendon-square, Somers-town, for a finished drawing from a statue, the large Silver Medal.

To Mr. A. H. Taylor, 3, Lower Stamford-street, Blackfriars, for a finished drawing from a statue, the Silver Palette.

Original.

To Mr. Ed. Hassell, 12, Upper Belgrave-place, Pimlico, for a painting in oil of the altar-piece of St. Margaret's Church, the Silver Palette.

To Mr. A. R. Slous, 6, Bayham-street, Camden-town, for an original historical composition in water-colours, the large Silver Medal.

To Mr. J. W. Solomon, 8, King-street, Covent-garden, for an original historical composition in oil, the large Silver Medal.

To Mr. D. Pasmore, 6, Salisbury-court, Fleet street, for an original group of portraits in miniature, the Gold Isis Medal.

To Miss L. J. Green, 8, South Crescent, Bedford-square, for an original portrait in miniature, the Gold Isis Medal.

To Miss Alabaster, 58, Piccadilly, for an original portrait in oil, the Gold Isis Medal.

To Mr. Jas. Y. Gaut, 54, Greek-street, Soho, for an original portrait in oil, the large Silver Medal.

To Mr. W. H. Freeman, 2, Stanhope-street, Clare Market, for an original landscape in oil, the large Silver Medal.

To Mr. C Marshall, 24, Everett-street, Brunswick-square, for an original landscape in oil, the Gold Isis Medal.

To Mr. W. R. Patterson, 2, Broadway, Westminster, for an original marine painting in oil, the large Silver Medal.

To Mr. A. G. Vickers, 8, Barton-street, Westminster, for an original marine painting in oil, the Gold Isis Medal.

To Mr. W A. Crabb, Point Pleasant, Wandsworth, for an original oil painting of flowers, the large Silver Medal.

To Miss L. A. Shaw, Stonehouse, Plymouth, for an original painting in oil of fruit and flowers, the Gold Isis Medal.

To Mr. L. Wells, 2, Stanhope-street, Clare Market, for an original oil painting of still life, the large Silver Medal.

To Mr. E. Lee, 26, Newland-street, Kensington, for an original historical com position in Indian Ink, the Silver Isis Medal.

Models and Carvings.

To Mr. J. Mason, Twickenham, for a model of a bust from life, the large Silver Medal.

To Mr. H. Hogan, 12, Park-street, Dorset-square, for a copy in plaster of an architectural ornament, the large Silver Medal.

To Mr. H. Bailes, 434, Oxford-street, for an original group of figures carved in wood, the large Silver Medal.

* To Mr. S. Briant, 34, Monmouth-street, for his model of St. Clement's Church, the Silver Isis medal and £5.

Architecture.

To. Mr. R. Stokes, 29, Lower Brook-street, Grosvenor-square, for a drawing in perspective from a Corinthian capital, the large Silver Medal.

To Mr. R. Garland, 13, Gray's-Inn Terrace, for a drawing in perspective from a Corinthian capital, the Silver Isis Medal.

To Mr. T. J. Kilpin, 6, Orchard-place, Kingsland-road, for an original design for a Gothic Cathedral, the large Silver Medal.

Gem Engraving.

To Mr. C. Durham, 17, Arundel-street, Strand, for an engraving in intaglio of a head, the Gold Isis Medal.

Engraving on Wood.

To Mr. M. M. Hart, 31, Gerrard-street, Soho, for engravings on wood, the large Silver Medal.

In Manufactures.

To C. T. Tower, Esq. Weald Hall, Essex, for his flock of Cashmeer Goats, and for a shawl manufactured from their wool, the large Gold Medal.

To Mr. R. Lloyd, 71, Strand, for his sheet cork, the Silver Isis Medal.

In Colonies and Trade.

To the Rev. L. Guilding, King's Town, St. Vincent's, for his communication respecting the insects which infest the sugar-cane, the Gold Ceres Medal.

To. W. Green, Esq. Quebec, for pigments, the produce of Canada, the Gold Isis Medal.

To Greg. Blaxland, Esq. Sydney, New South Wales, for wine, the produce of his vineyard in New South Wales, the Gold Ceres Medal.

List of Patents,

GRANTED BY THE FRENCH GOVERNMENT, FROM 1st JANUARY, to 31st MARCH, 1828.

Sequin, letter press printer, Paris, for manufacturing china paste boards. 5 years.

Claude Pierre Roux, jeweller and gilder, Paris, for a mechanical frame, called a *pendule*. 5 years.

Pierre Jeandeau, Knight of the Legion of Honour, Director of the Works of the Royal School of Arts and Trades, at Châlons, for a machine for throwing up a continued steam, suited for draining. 10 years.

John Nicholson, Paris, engineer, for a process, apparatus, and machinery for preparing and printing the threads of flax, cotton, silk, &c. 15 years.

Claude Jean Baptiste Alexander Berthault, Surveyor of Roads, Châlons, for a process for making a water-proof mastic. 15 years.

Victor Lemétayer, manufacturer, Fécamp, for a warping machine. 10 years.

Pierre Bouillon, junior, limoges, for a system of steam engines of all pressures, 10 years.

Auguste de Boussard, clock-maker, Toulouse, for a superior self-cleansing level lamp. 10 years.

Francois Chatelard and Petrus Perrin, steel comb makers, Lyon, for a comb of a new form, adapted to broad cloths. 5 years.

Delamnay, surgeon, Nantes, for an instrument of a particular form for midwifery. 5 years.

Jacques Nicholas Legendre, Ecquainville, for a mechanical mode of making barrells, tubs, &c. 15 years.

Jean Pierre Praget, Ais, brazier, for a still. 10 years.

William Kinner Marshal, London, for a new method of mounting cannon. 10 years.

Hemsteller and Rieger Bommer, Vassellonne, for a new method of making roads. 10 years.

Jacques Javel, junior, one of the Proprietors of the Messageries Royalis, Paris, for the construction of a carriage for transporting goods and passengers with expedition. 15 years.

Louis Aubry, merchant, Chaumont, for a machine for sowing by back-stitch and quilting, called the Métier Régulateur. 5 years.

Dumont, refiner, Paris, for a method of baking, clarifying, and filtering sugar. 10 years.

Alexander Derlin, Paris, for the application of hydrogen gas to lamps with a double current of air, serving as an impellant and burner. 15 years.

Daniel Girand, Paris, for a method of using the "filvire," invented by Caiman Duverger. 5 years.

Paul Portal & Co., Bordeaux, merchants, for a steam engine with Gurney's high pressure. 15 years.

Bertrand Fourmond, engineer, Nantes, for a printing press, with jointed movements, by means of a lever, called the *Presse Nansaise*. 5 years.

Dr. Barrier, Lavoulte, for a pneumatic hydraulic machine. 15 years.

Michel Oddo, mechanician, Marseille, for a method of preventing smoky chimneys. 5 years.

Joseph Guyon, Dole, for the construction of an economical kitchen furnace. 10 years.

Pierre Agathe Mostier and Jean Baptiste Bourgen, mechanics, St. Etienne, for a process of making wide ribbons on looms *a la Zusichoise*. 10 years.

Henri-Joseph Pohlen, Paris, for a method of taking the gloss off cloths and other stuffs. 5 years.

Jean Pierre Palissard, Escorneboeuf, for a machine called a *Tractariaterre*, for transporting earth. 5 years.

Bruno de Villeneuve and Jean Jacques Mathieu, silk manufacturers, Lyons, for a method of making watered ribbons, called *a grands effets*. 10 years.

Sequin & Co. civil engineers and manufacturers of annonay, for a steam boiler, on the principle of the warm air circulating in small isolated tubs. 10 years.

Edward Dodd, pianoforte-maker, for certain improvements. 5 years.

William Newton, London, for metallic blinds and window shutters. 5 years.

Jacques Francois Adam, Paris, for a new method of binding books. 10 years.

Jean Fayolle and Jean Baptiste Joseph Legros, brace makers, Paris, for a loom with four pedals for manufacturing several garters or braces at once. 5 years.

Antoine Jourdon, Paris, for a carriage that cannot be overturned, called *douillette d'aplont*. 5 years.

Louis Favre, Marseille, for the making of soap without fire, by means of pure artificial soda, or his salt of soda, and pure olive oil. 5 years.

Andre Millet, merchant, Paris, for a portraitive chimney. 5 years.

Gabriel Vandemerghel, brewer, Armentieres, for a method of making white beer, as at Louvain. 15 years.

Auguste Moineau, clock maker, Paris, for a movement of indestructible pressure applicable to machinery as well as clocks, called *à la moineau*. 15 years.

Jean Baptiste Barnard Maitre Humbert, Jean Baptiste Charlemagne Louis-Bazile, and Adlren Chenot, Chatillon sur Seine, for a process of obtaining iron with economy of fuel, without previously melting the ore or dross. 15 years.

Martial Thenvoit, innkeeper, Autun, for a machine for stretching the cords of musical instruments. 10 years.

Jean Alphonse Camme, mechanician, Malannay, for improvements in the cogs of pulleys, for sea service. 5 years.

Charles Frederic Baer, coach-builder, Strasburg, for a method of turning a carriage round short by means the fore wheels moving with hinges. 5 years.

Gautier, Nantes, for the preparative of and method of preserving butter. 5 years.

Sebastien Prefaut, turner, Nevers, for a press adapted to every purpose where pressing is required. 5 years.

Mury, Paris, for improvements in making clogs. 5 years.

Louis Jean Pierre Jomard, Valence, for a method of surveying by means of an instrument called a *tact-Graphique*. 5 years.

Michel Giand, spinner, Marseilles, for a machine called a *balancier moteur*. 5 years.

The Turf Pit Company at Crony-sur-Ourcq, for improvements in the oven preparing peat. 5 years.

Achille de Bernaidière, manufacturer, Paris, for a method of making fine baskets and cane work with stripes of whalebone. 5 years.

Christophe Francois Martin Dillemann, manufacturer, and Jean Michel, Reiuhardt, mechanic, Strasburg, for a horizontal bobbin, with vertical pressure, for spinning cotton. 10 years.

Alexis Bruno Gensoul, physician, Bagnols, for a method of warming the pans for spinning the silk cacoons with economy of fuel. 10 years.

Pierre Revon, mechanic, Paris, for a steam engine adapted to carriages and vessels of all descriptions. 10 years.

Caiman Duverger, architect, Soisy sur Etiolles, for a new syringe, called a *clysoir*. 5 years.

Etiemne Lasgorsieux, mecanician for improvements in the construction of machinery for opening, and preparing, and spinning wool, silk, hemp, flax, &c. 10 years.

Francois, junior, and Bernoit, builders, Troyes, for a lithographic press, with cylinders. 5 years.

John Neale and Alexander Cowan, Nancy, for a method of preparing and passing cotton and thread through steam. 5 years.

Penelet, father and son, watchmakers, Paris, for an instrument called *compteur de physique and d'astronomié*. 15 years.

Louis Joseph Pelleport, and Wm. Poupier, *née* Jeanne Antoinette Selos, Paris, for a method of rendering stuffs and paper of all colours water-proof. 5 years.

John Neale and Alexander Cowan, engineers, Nancy, for a mechanical loom which prepares its own warp. 5 years.

Antoine George, silk knit manufacturer, Lyons, for a machine for making bricks. 5 years.

Pierre Monuet, the son, brandy distiller, at Grand Gallargues, for an apparatus for distilling wines and the dregs of grapes. 10 years.

Pierre Fasanini, merchant, Lyons, for a machine for weaving stuffs of all kinds and which stops when the woof or warp breaks. 10 years.

Jean Baptiste Langlois-Quignolot, purse-maker, Paris, for a new stitch, called *point de tulle* or *point à jour*, in making purses, worked by machinery. 5 years.

Saint Maurice Cabany, merchant, Paris, for a machine for making a coating of gold or silver or any other matter with variegated colours, adapted as ornamental borders, &c. which may be pasted or glued to bronzes, pasteboard, and cabinet works, &c. 15 years.

Mathias Levi Lauzenberg, Morocco-leather manufacturer, Strasburg, for a method of separating in two the skins of calves and goats. 10 years.

Pierre Jacques Debezis, Paris, for an elastic bathing tub, called *boignoues dormeuses.* 10 years.

Pierre Gervais Emmanuel Meunier, and Guillaume Mars, sheet iron manufacturers, for sheet iron measures, for measuring corn, &c. 5 years.

Raymond de Gaston, Ex-Receiver General, Paris, for a smoke machine, adapted at a small expense, to every chimney. 5 years.

John Heathcoate, Paris, for improvements in the movement of the bobbins in making bobbin-net. 15 years.

Dominique Marie Houlet, and Silvain Riverin, button makers, Paris, for the employment of pieces and remains of whalebone, for making buttons of all colours. 5 years.

Maximin Cassagnica, Paris, for an apparatus for preparing and carbonizing peat. 10 years.

Louis Baron, merchant, Nismes, for further improvements in distilling. 10 years.

Schlumberger, father and son, Paris, for a loom for weaving flax and hemp. 5 years.

Jean Louis Jaume, Paris, for a method of baking plaster and lime, and the soil for making tiles, bricks, and slabs. 15 years.

Pierre Joseph Paret, mechanician, Montpellier, for a weighing machine. 15 years.

Auguste de Boussard, watch-maker, Toulouse, for a superior self-cleansing level lamp. 10 years.

Jean Baptiste Bailleul, chymist, Paris, for a distilling apparatus by steam for extracting the alcohol from dregs of grapes, &c. 5 years.

Lagier, merchant, and Robiquet and Colin, chemists, Paris, for a method of purifying madder. 10 years.

Ager and Co., Paris, for a machine for making matches. 5 years.

Bandin, senior, Paris, for a new method of transporting and preserving fish. 15 years.

Authoine, junior, Paris, for constructing furnaces of free stone, called *pierre de Brabantine*, or *Pierre à feu.* 5 years.

Francois Jean Guillaume Dande, Paris, for metallic loop holes in stays, dresses, &c., instead of those worked with the needle. 5 years.

Josue Heilman, Mulhausen, for a cotton spinning machine, called *lauterne bobinense.* 10 years.

Zuber and Co., painted paper manufacturers, Rixheim, for a method of printing paper by means of a hollow engraved roller, instead of by hand. 10 years.

Francois Benoit Hermier, lock-smith, Monteux, for an instrument for scythes to give them the curve. 5 years.

Francois Vallett, cloth manufacturer, Lodeve, for a bandage with elastic cushion 5 years.

Sapy, Brothers, Beaucourt, watchmakers, &c. for a mill for strengthening, cutting and lengthening the wire intended for pins and for forming the worm of screws for wood or metal 15 years.

Pierre Bernardot, and Daubanton & Co., Paris, for making paper of animal substances, called *aporeutype.* 15 years.

Lichartier, drawing master, and Labove Delille, Cultivator, for a machine for winnowing corn.

Matthieu Casson, billiard table maker, Paris, for a method of making the pockets of billiard tables with grooves, and other improvements. 5 years.

Paris, June 25, 1828. CHARLES ALBERT.

New Patents Sealed in 1828.

To Thomas Aspenwall, of Bishopsgate Church Yard, in the city of London, esq. in consequence of a communication made to him by a certain foreigner residing abroad, for an improved method of casting printing types, by means of a mechanical process, which invention he proposes to call the mechanical type caster—Sealed 22nd May—6 months for inrolment.

To Samuel Hall, of Basford, in the county of Nottingham, cotton manufacturer, for his having invented or found out a new method of, and an apparatus for generating steam and various gasses, to produce motive power and for other useful purposes—31st May—6 months.

To James Moffat, of King's Arms Yard, Coleman-street, in the city of London, master-mariner, for his having invented an improvement in apparatus for stopping and securing chain cables, also for weighing anchors attached to such chain or other cables, either with or without a messenger—3 June—6 months.

To Daniel Jobbins, of Uley, in the county of Gloucester, millman, for his having invented an improved method by certain machinery applicable to stocks or fulling machines of milling and scowering woollen cloths and other fabrics requiring such process—3rd June—2 months.

To Baron Charles Wetherstedt, of Commercial Place, Commercial Road, in the county of Middlesex, for his invention of a liquid or composition for water-proofing or strengthening leather—4th June—6 months.

To Richard Witty, of the township of Hanley, in the county of Stafford, engineer, for his having invented or found out certain improvements in apparatus for making and supplying coal gas for useful purposes—10th June—6 months.

To Edmond Gibson Atherley, of York Place, Portman Square, in the county of Middlesex, esq. for his having invented an apparatus for a method of generating power applicable to various purposes—12th June—6 months.

To William Stratchan, of Avon Eitha, in the parish of Ruabon, in the county of Denbigh, manufacturer, for his having invented or found out an improvement in the making or manufacturing of alum—12th June—4 months.

To John Bartlett, of Chard, in the county of Somerset, shoe thread manufacturer, for his invention of a new and improved method or methods, or manufacturing process for preparing flax, thread, or yarn for use in the manufacture of boots, shoes, sadlery, and of sails, and other cloths and bagging—16th June—2 months.

To George Johnson Young, of the town and county of Newcastle-upon-Tyne, iron founder, for his invention of a machine whereby an additional and improved purchase or power will be given in working Ships' Windlasses and capstans—21st June—6 months.

To Samuel Pratt, of New Bond Street, in the Parish of St. George, Hanover Square, in the county of Middlesex, camp equipage maker, for his invention of certain improvements on elastic beds, cushions, seats, pads, and other articles of that kind—25th June—6 months.

Meteorological Journal kept at the London Institution.

DATE.	TIME.	BAROM.	Thermometer. IN.	Thermometer. OUT.	WIND.	REMARKS.
Ma 26	9	29·80	60	60·8	E.	Cloudy
	3	29·55	64	64·8	E.—N. E.	Ditto
27	9	29·55	60	60·6	E.—S. E.	Fine
	3	29·55	63	63·2	S. W.	Stormy
28	9	29·55	61	57·2	W.	Ditto
	3	29 55	63	63·4	S. W.	Ditto
29	9	29·55	59	60·8	S. W.	Fine
	3	29·55	62	64·2	S. W.	Ditto
30	9	30·00	60	60·6	S. W.	Rain
	3	30·00	63	64·8	W.—S. W.	Cloudy
31	9	29·85	61	57·6	S. W.	Ditto
	3	29·90	64	60·4	S. W.	Showers
June 2	9	30·00	60	58·8	S. W.	Cloudy
	3	30·00	62	61·2	S. by W.	Ditto
3	9	30·05	61	59·4	S. W.	Heavy Rain
	3	30·00	63	63·2	S. W.	Fine
4	9	29·65	60	57·6	W —S. W.	Stormy
	3	29 65	61	59·8	S. W.	Cloudy
5	9	29·55	58	55 6	W.	Fine
	3	29·60	61	59·8	W.	Rain, Hail
6	9	29 70	59	58·4	W.	Fine
	3	29 75	62	63·2	W.	Rain, Hail
7	9	30·05	69	53·8	N. W.	Cloudy
	3	30·05	61	57·4	W.	Ditto
9	9	30·40	60	57·8	S. W.	Fine
	3	30·40	62	64·4	S W.	Ditto
10	9	30·30	60	59·8	W.	Cloudy
	3	30·30	63	64·2	S. W.	Ditto
11	9	30·30	62	62·2	N. W.	Cloudy
	3	30·30	64	67·2	N. W.	Fine
12	9	30·30	63	64 4	N. W.	Cloudy
	3	30·30	63	64·4	N. W.	Ditto
13	9	30·30	62	59·4	N. by W.	Fine
	3	30·30	64	61·4	E.	Ditto
14	9	30·30	63	60·4	E.	Ditto
	3	30·30	65	64·4	N. E.	Ditto
16	9	30·05	65	64·4	N. E.	Cloudy
	3	30·05	66	64.3	N. E.	Ditto
17	9	29·60	65	64·4	N. E.	Ditto
	3	29·60	66	66·4	S.	Ditto
18	9	29·50	60	60·4	S.	Ditto
	3	29·40	62	60·4	S. W.	Ditto
19	9	30.00	64	61·4	S. W.	Ditto
	3	30.05	67	66·5	S. W.	Fine
20	9	29·60	66	62·0	S.	Cloudy
	3	29·90	68	64·25	S. W.	Fine
21	9	29·80	64	63·0	S. W.	Rain
	3	30·00	66	62·0	S. W.	Cloudy
23	9	30·15	62	60·25	N.—W. N.	Fine
	3	30·15	64	63·0	N.—W. N.	Ditto
24	9	30·20	64	60·0	N.—W. N.	Ditto
	3	30·30	63	65·4	N.—W N.	Ditto

CELESTIAL PHENOMENA FOR JULY, 1828.

D.	H.	M.	S.	
1	0	0	0	Clock before the ⊙ 3' 25"
1	0	0	0	♃ Stationary near λ in Virgo.
3	18	1	0	☾ in □ last quarter.
3	23	0	0	☾ in conj. with ε in Pisces.
4	4	0	0	☾ in conj. with ζ in Pisces.
5	0	0	0	Clock before the ⊙ 4' 9"
6	0	0	0	♀ Stationary.
7	20	0	0	☾ in conj. with 1 δ in Taurus.
7	21	0	0	☾ in conj. with 2 δ in Taurus.
7	23	0	0	☾ in conj. with ε in Taurus.
10	0	0	0	Clock before the ⊙ 4' 57"
11	0	0	0	☿ Stationary.
11	13	29	0	Ecliptic conj. or ● New Moon.
13	3	0	0	☽ in conj. with ☿. Long. 8° in Cancer. ☽ lat. 4° 46' S. ☿ lat 3° 31" S. diff. lat. 1° 15'
13	8	0	0	☽ in conj. with 1 α in Cancer.
13	9	0	0	☽ in conj. with 2 α in Cancer.
13	12	0	0	☽ in conj. with ♀. long. 12½° in Cancer, ☽ lat. 4° 39' S. ♀ lat. 3' 31" S. diff. lat. 1° 8'
14	7	0	0	☽ in conj. with ο in Leo.
14	17	0	0	☽ in conj. with π in Leo.
15	0	0	0	Clock before the ⊙ 5' 34"
16	9	32	40	♃'s 1st Satt. will emerge.
16	18	0	0	♀ in conj. with 2 α in Cancer.
16	20	0	0	☽ in conj. with υ in Leo.
17	10	11	32	♃'s 3rd satt. will emerge.
18	4	0	0	in conj. with 1 α in Cancer.
19	16	3	0	☽ in □ first quarter.
20	5	0	0	☽ in conf. with λ in Virgo.
20	6	0	0	☽ in conj. with ♃. Long. 5° in Libra. ☽ lat. 1° 14' N. ♃ lat. 1° 6' N. diff. lat. 8'
20	0	0	0	Clock before the ⊙ 5' 58"
21	14	'	0	☽ in conj. with 4 ζ in Libra.
21	23	0	0	☽ in conj. with ϑ in Libra.
22	11	2	0	⊙ enters Leo.
25	0	0	0	Clock before the ⊙ 6' 8"
26	7	0	0	☾ in conj. with β in Capri.
26	10	19	0	Ecliptic Opposition, or ○ Full Moon.
28	6	0	0	☽ in conj. with ϑ in Aquarius.
30	0	0	0	Clock before the ⊙ 6' 3"
31	6	0	0	☾ in conj. with ε in Pisces.
31	11	0	0	☾ in conj. with ζ in Pisces.

☽ The Waxing Moon.— ☾ The Waning Moon.

Rotherhithe J. LEWTHWAITE.

METEOROLOGICAL JOURNAL, FOR MAY AND JUNE 1828.

1828.	Thermo. Hig.	Thermo. Low	Barometer. High.	Barometer. Low.	Rain in inches.	1828.	Thermo. Hig.	Thermo. Low.	Barometer. High.	Barometer. Low	Rain in inches.
MAY						JUNE					
26	68	45	29,74	29,62		11	72	55	30,20	30,16	
27	63	45	29,46	Stat.	,2	12	64	54	30,16	30,14	
28	62	45	29,57	29,48	,25	13	72	43	30,16	Stat.	,15
29	62	52	29,63	29,59		14	72	44	30,16	Stat.	
30	69	52	29,90	29,83	,625	15	73	49	30,16	Stat.	
31	59	50	29,86	29,80	,025	16	68	54	29,94	29,80	
JUNE						17	73	55	29,58	29,53	,025
1	67	49	29,96	29,94	,075	18	68	50	29,50	29,43	,05
2	67	50	29,86	Stat.		19	70	55	29,90	29,86	,175
3	64	46	29,91	29,84		20	70	52	29,92	29,91	,1
4	59	52	29,61	29,46	,175	21	66	52	29,83	29,82	,35
5	62	46	29,50	29,29	,575	22	64	49	29,86	29,83	,125
6	65	48	29,74	29,56		23	68	54	30,06	29,96	,05
7	63	45	29,96	29,88		24	73	51	30,21	30,16	
8	64	46	30,11	Stat.		25	78	41	30,26	30,22	
9	70	45	30,15	Stat.							
10	66	44	30,20	Stat.							

LOWER EDMONTON **CHARLES H. ADAMS.**

Lat. 51° 37' 32" N **Long. 3' 51" W. of Greenwich.**

THE

London

JOURNAL OF ARTS AND SCIENCES,

AND

REPERTORY

OF

PATENT INVENTIONS.

No. IV.

(CONJOINED SERIES.)

Recent Patents.

To THOMAS KNOWLES, *of Charlton Row, in the county of Lancaster, cotton spinner, for his having invented and brought to perfection, certain improvements in certain machinery, by aid of which machinery, machines commonly called mules, are or may be rendered what is termed self-acting, that is to say, certain improvements in certain machinery, by aid of which machinery, spinning machines, commonly called mules, are or may be worked by power, without requiring the usual application of strength of the spinners to give motion to the handles or wheels, and to such other parts of mules as are commonly worked by the strength of spinners.*—[Sealed 23d May, 1831.]

(*Continued from page* 123.)

THE parts and actions above described of the self-acting machinery, have no operation whatever on the common article of the mule, whereby the carriage latches into gear when it gets in, and prepares for coming out again; all which, together with the coming out and twisting after it is carried out, is done in the usual manner, excepting that the worm wheel, called the bell wheel or twist wheel, is not always engaged with the worm at the end of the axis of the rim D, for the end of the axis and of the bell wheel, is supported in the end of an elbow lever L, which is moveable about a stud pin fixed into the standard for the axis of the rim, and the lower end of the lever L, is acted upon by a short lever, which is fixed on the extreme end of the axis 12 of the lever *b*, when the carriage gets nearly out and presses towards the lower end of the lever *b*, as before described, in order to set the spring 10 on a strain, then the short lever on the end of the axis 12 presses against the tail of the elbow lever L, and raises up the end of the axis C, until the worm wheel takes into gear with the worm at the end of the axis of the rim; and after the worm wheel is so put into gear, it acts in the same manner as is usual with mules, to cause the main driving strap to be shifted on to the loose pulley, as soon as the proper quantity of twist is put into the threads, and in addition thereto the axis C, brings the backing off machinery into action by means of the extra finger *v*, as before described, which shifts the backing off strap 14 from the fast pulley 5, to the loose pulley 15, but not when two such mules are worked together in a pair, by means of an improvement hereafter to be described; then the said shifting of the backing off strap 14 will be retarded, by what I call a detaining latch, to be hereinafter described, in all cases when the two mules are not keeping proper time one with another, in respect to the coming out and going in of the carriage; but if the mules are keeping proper time, then the additional finger *v*, causes the backing off machinery to be put in action at once, when the carriage runs in and leaves the lever *b*, at liberty, then the short lever on the end of the axis 12 of that lever, allows the elbow lever L, to drop at the end of the axis, and so far as to take the worm wheel out of gear with the worm, and then a chain and weight, which is applied to the rim of a pulley, which is fixed on the axis C, pulls that axis and its fingers *g*, and *v*, round, so as to place them in a proper position for putting them again into gear, when the carriage gets nearly out at the next stretch.

Description of the Machinery for running in the Carriage.

The axis 3, by means of a pair of mitre wheels N, which are about four inches diameter, with thirty teeth, turns an inclined axis O, at the opposite end of which is a bevel pinion of sixteen teeth, to turn a bevel wheel P, of 48 teeth, which is 7¾ inches diameter; that wheel is fixed on an axis, which extends horizontally across the frame, and a scroll Q, is fixed upon the axis to receive two cords R, and S, which are conducted opposite ways over two leading pulleys at each end of the frame, and the ends of the cords are made fast to the carriage with wind up pins to adjust the length of each cord R and S; the scroll Q, is a double spiral curve, which sets out at the radius of 13-8 inches, measured from the centre of the axis to the middle of the end, and after making the turns, the radius, by enlarging continually, becomes 6¾, which is the largest radius, and then the radius begins to diminish again by a similar curvature, but of contrary flexure, until after making 1¼ turns, the radius becomes 13-8 inches, as at first.

Note.—The curvature of the scroll, for nearly 1-6th of a circle, on each side of the largest radius of 6¾ inches, conforms very nearly to an arch of a circle described about the centre of motion. There are two separate grooves in the edge of the scroll Q, to receive the two cords R and S, which wind contrary ways above the scroll; the bearing for the upper end of the inclined axis O, is fastened to the slider 7, and when that slider is moved endways by its spring 10, in order to throw the backing off pulley 4 out of gear, and discontinue the backing off motion as before described, the mitre wheels N, are brought into gear, and they transmit motion with a diminished velocity to the scroll Q, which by winding up the cord R, runs the carriage in. At first starting, the cord R, winding on the small radius of the scroll nearest to the centre thereof, puts the carriage into motion quietly, and without any jerk; but as the carriage runs in, the cord R, gradually winds upon an increasing radius, so as to move the carriage quicker with an accelerating motion, until it gets about half way in, and then the carriage is moved at its quickest rate of running in, in consequence of the cord R, being drawn by the largest radius of the scroll; after the carriage has completed half its course, it begins to run in slow, as it advances further in, the velocity of motion continually decreases, until it gets quite in, by which time the smallest radius of the scroll comes into action, and moves the carriage slowly up to its stops, without violence or jerk. The varying rapidity of motion which is obtained by running in the carriage by the said scroll, is very similar to the motion which spinners give to the carriages of common mules, in putting up the carriages by hand. When the carriage gets quite in, the slider 7 is moved, by first setting its spring 10 on a strain, and then releasing the catch 9, in the manner before mentioned, and thereby the mitre wheels N, are taken suddenly out of gear, leaving the scroll guide at liberty to be turned backwards by its cord 5, which has no other office to perform than to turn the scroll round backwards whilst the carriage is coming out, until the scroll reaches its proper starting place, which is when the carriage is quite out, and then it is ready to begin its action of running the carriage in again, for another succeeding stretch: that action being begun, as before explained, by the mitre wheels N, locking into gear, by the same movement of the slider 7, which caused the cessation of the backing off motion.

Note.—The machinery for running in the carriage is already used in the self-acting mules, and forms no part of my improvements.

Description of the Machinery for winding up the Threads.

It has already been stated, that if the carriage is run in whilst the drum band is held motionless, the end pulley F, will be turned round so much by its action against the stationary cord, in a similar manner to the action whereby a carriage which is turned round upon its own axis, when it is running along a road, as to produce 12½ turns of the spindles during the running in of the carriage, through its course of sixty inches, by the ordinary action of a common mule, without any regard to self-acting machinery; also that the spindles require to make 74 turns during the said running in of the carriage, to wind up the threads at the first stretch, when those threads must be coiled round the bare spindles; and also that the spindles must make 36 turns during the said running in of the carriage, in order to wind up the threads at the 500th or last stretch, when those threads must be coiled round the cones at the top of the cops.

The machinery for winding up must be calculated to increase the said 12½ turns of the spindles, which would be produced without its aid to 74 turns of the spindles at the first stretch, when the greatest number of turns is required, and to 36 turns at the 500th stretch, when the least number of turns is required ; therefore the machinery for winding up, must give 61½ turns of the spindles during the running in of the carriage at the first stretch, and 23½ turns of the spindles at the 500th stretch. On the axis of the twist pulley E, a pinion 24, of 38 teeth, is fixed, in order to be worked by the teeth of a spur wheel 25, of 80 teeth, which is situate nearly beneath the axis of the twist pulley E ; a small cylindrical roller 26, called the winding up barrel, is fixed upon the same axis as to the spur wheel 25, which axis is mounted between two arms which project out from each end of a hollow axis 27, in order to form a frame to receive the wheel 25, and the winding up barrel 26 ; the axis 27 of that barrel is supported on a horizontal centre pin or bolt put through the leg of the framing of the mule head, and the other end of the bolt is sustained by a small upright standard between the legs of that framing.

The spur wheel 25 can be engaged with the teeth of the pinion 24, or disengaged therefrom, by raising or lowering the frame in which the axis of the barrel and spur, which is mounted; which raising or lowering is performed by moving the said frame around the centre pin of the hollow axis 27, by which the frame is supported. For that purpose one of the arms, which projects out from the axis 27, is connected at its end by a small rod or upright link 28 to the horizontal arm of an elbow lever 29, which plays upon a stud centre pin fixed to the framing at the outside thereof, and the upper end of the upright arm of the elbow lever 29, is perforated to receive the extremity of a pin 30, which projects out from the back of the slide 7, being fixed firmly in that slider; the action of these parts is to put the teeth of the spur wheel 25 in the axis of the winding up barrel 26, into gear with the teeth of the pinion 24, in the axis of the twist pulley, by the same change of gear which occasioned the cessation of the backing off; and also the commencement of the running in of the carriage, viz. when the slider 7 is suddenly moved in a direction away from the carriage, it puts the mitre wheel N, and the pinion 24, and wheel 25, in gear at the same instant, and also disengages the backing off pulley 4 from its clutch box 6, on the axis.

Note.—The link 28 is adjustable in length by a screw to regulate it so that the mitre wheel N, and the pinion 24, and spur wheel 25 will run properly in depth gear, at the same time the twist pulley must make 80-30 or 2'-100 turns to one of the winding up barrels; and as the spindles make 8-16 turns to one turn of the twist pulley, it follows that the spindles must make 57 turns to one turn of the winding barrel, when the spur wheel 25 thereof is in gear with the pinion 24, a cord 31, called winding up cord, is coiled around the winding up barrel 26, and the other end of the same cord 31 is coiled round a spiral fusee 32, whereof the axis, which is vertical, is mounted in a suitable frame 33 at the end of the carriage of the mule. To understand the action of winding up the threads at the first stretch, when 74 turns of the spindles must be made during the running in of the carriage, it is not necessary to contemplate any action of the fusee 32, because that fusee does not then turn round much about its axis; but the winding up cord 31, may be considered as if it were made fast to the carriage, so that the carriage in running in through a space of 60 inches, will draw after it 60 inches in length of the winding up, and 31 in receding from the winding up barrel 26; and the said cord being coiled around the barrel 26, the drawing off of the cord must turn that barrel round, and that turning motion is transmitted by the spur wheel 25, and pinion 24, to the twist pulley, with a multiplication of 2 and 11-100 times, and therefrom the spindles are turned with a further multiplication of 8 and 11-16, or in the whole the turning motion given to the winding up barrel by so drawing off the cord 35 from it, is transmitted to the spindles with a multiplication of 17 turns, as before stated. The winding up barrel 26 is 27 inches* in circumference, to the middle of the thickness of the cord 31; therefore the 60 inches length of that cord which the carriage pulls off in the above case from the barrel would cause it to turn round 3 and 53-100, which number multiplied by the 17 turns that the spindles make, as aforesaid, to one of the barrel, shews that the spindles will be turned round 60 times during the running in of the carriage, by virtue of the winding up machinery, to which number must be added the said 12½ turns which the spindles derive from the common action of a mule, independently of any self-acting machinery thereto; and it gives 72½ turns, which is rather short of the 74 turns which are requisite, and hence if the machinery were to act as above supposed, the threads would be wound up a little too slack about the spindles. To explain how that deficiency is made up, the action of the fusee 32, which was before assumed to have no action, must be included in the calculation; the fusee 32 is turned a little round about its axis, by means hereinbefore explained, during the running in of the carriage, the turning being in that direction, and to that extent of turning motion which will cause the fusee to coil or gather up a short length of about $1\frac{1}{4}$ inches of the leading end of the cord 31, about the spiral groove of the fusee, which $1\frac{1}{4}$ inch is so much additional length of cord to be drawn off from the barrel 26, beyond the 60 inches, which are drawn off therefrom by the receding motion of the carriage before stated; and that extra $1\frac{1}{4}$ inches of cord so drawn off, in consequence of the action of the fusee, will cause such an addition to the said calculated number of turns made by the spindles, as will cause them to make the proper number of 74 turns.

The necessary turning motion of the fusee 32, about its own axis, is thus produced (see Plate VI. fig. 1, of the drawings). Beneath the spiral groove 32 of the fusee, wherein the winding up cord 31 coils, the fusee is formed with a cylindrical barrel part 34, around which barrel part a cord or chain 35 is coiled, the end of that cord or chain being made fast to the circumference of the barrel 34. The other end of the cord or chain 35, passes horizontally from the circumference of the barrel part 34 of the fusee beneath the carriage in the direction of the length thereof, and makes a half turn around a pulley or sheave 36, and then returns horizontally parallel to its former course, and the extremity is made fast to the frame 37 which supports the fusee, and which frame is fixed beneath the carriage, so as to be part thereof. The end of the cord or chain 35 is secured to a winding up pin 38, or a screw by which the length of that part of the cord or chain which is in action can be adjusted. The sheave 36 is mounted on an upright centre pin in the space between the two plates T, which are fastened together to form a frame for the sheave, and that frame is fitted in the manner of a slider, to move horizontally endways, backwards and forwards, in a groove, which is formed between the two long rails 37, which rails are fixed horizontally, as before mentioned, beneath the carriage. The slider T, containing the sheave 36 within it, is moved along endways in the said groove, when it is required to do so, by means of a long rule V, which is placed horizontally and flatways beneath the carriage, its length being either in the direction in which the carriage runs, or else obliquely to that direction, as is represented in Plate VI. fig. 2. The said rule V, is supported at each of its ends at X and Y, to bear its weight, and hold it fast at any obliquity at which it may be placed. The middle part of the rule V, passes through the opening in the slider T, without touching any part of the slider, but the roller W, is mounted on an upright centre pin in the space between the upper and lower part of the slider T, and the roller lies within the opening of the slider T, in the same manner as the sheave 36 does, but the sheave 36 is at that side of the ruler V, which is nearest the fusee at the end of the carriage, and the sheave does not touch the rule, but the roller W, is at the opposite side of the ruler, and applies with its circumference to the edge of the rule, so as to roll along the same when the carriage is run in or out, and the tension of the cord or chain 35 will keep the said roller W, always in contact with the edge of the rule V, which edge, when the rule is placed obliquely, as is represented in sheet IV, will act in the manner of an inclined plane to the roller W, whilst the carriage is running in, and will then allow the slider T, to move in its groove 37, by the tension of the cord 35, in a direction towards the fusee at the end of the carriage, whereby the sheave 36 will give up a portion of the cord 31 to the barrel part 34 of the fusee as the carriage runs in, and the barrel part will wind up that said portion of cord around itself, by the tension to which the cord 31 is subjected, when, by pulling it off from the winding up barrel 26, it turns that barrel round, in order to give motion by the spur wheel 25, and pinion 24, to the twist pulley, and therefrom to the spindles, as before described. The same tension of the cord 31 will cause it to pull off and unwind itself from the spiral groove 32 of the fusee, as far as ever the cord 35 will allow the fusee to turn round about its own axis, but how far that will be, depends upon how much the edge of the inclined rule V, will allow the roller W, and the slider T, to move along in its groove 37 during the running in of the carriage.

The effect of the above combination of parts is, that the edge of the rule V, when it is placed in an oblique direction to the running in of the carriage, will allow the slider T, to move in its groove towards the fusee when the carriage is running in, and by the aid of the sheave 36, the motion thus allowed to the slider T, is caused to allow twice as much length of the cord 35 to be given up to the cylindrical part 34 of the fusee, as the inclined edge of the rule V, allows the slider T, to move along in its groove 37. Whatever length of the cord or chain 35 is thus yielded up to the barrel part 34, it allows the fusee to turn round to a corresponding extent about its own axis, by virtue of the tension of the winding up cord 31, a portion of which unwinds itself from the spiral groove of the fusee, thereby giving out a portion of that cord 31 at the leading end thereof, viz. at that part thereof which is coiled round the spiral groove of the fusee. All the length of the cord so given out by the spiral groove 32 of the fusee, is a deduction from what would otherwise be drawn off from the winding up barrel 26. For instance, at the 150th stretch, when the full cones are completed, the rule V, must be set at that degree of obliquity which is represented in fig. 2, and during the running in of the carriage, it will allow the roller W, and slider T, to move about 15¾ inches in its groove towards the end of the carriage; the sheave 36 causes the cord or chain 35 to yield up twice as much as 31½ inches to the barrel part 34 of the fusee, and that allows the whole of the fusee 34, 32, to make about 2½ turns about its own axis, whereby the fusee unwinds, and gives out from its spiral groove 35 inches in length of the cord 31, consequently when the carriage runs in through its course of 60 inches, instead of pulling off and unwinding that length of the cord 31 from the barrel 26, it draws off only 25 inches; therefore which is 35 inches less than the run of the carriage, because the spiral groove fusee, by unwinding 2¼ turns, has given out 35 inches of the cord 31, at the end which is opposite to that end which winds about the barrel 26. The 25 inches of the cord 31, which is actually drawn off from the barrel 26, during the 60 inches run of the carriage, will cause the spindles to make 25½ turns, to which, adding the 12½ turns which are produced by the common action of the mule, independently of the self-acting machinery, gives 38 turns of the spindles during the running in of the carriage, as is required.

The end of the winding up cord 31 is made fast to the spiral groove of the fusee, at the interior end thereof, nearest the centre of motion, so that the cord 31, as it unwinds and pulls off from the spiral, acts continually at a less and less distance from the centre of motion of the fusee, owing to the spiral form of the groove 32 of the fusee, it gives out the winding up cord 31 in unequal portions of length, to corresponding equal portions of the space run over by the carriage towards the roller beam. The portions of cord which are given out at the first commencement of the running in of the carriages are the longest, and they shorten gradually as they get towards the interior end of the spiral. The spiral groove of the fusee gives the requisite variation of the turning motion of the spindles during the running in of the carriage, to suit the conical form of the cops, about which the threads are to be wound. The curve of the spiral groove of the fusee is accurately represented at fig. 3, on a larger scale, and from that drawing a proper fusee may be constructed.

Note.—When the cord 31 unwinds from that part of the spiral groove which is 3, radius to that part which is 13-8 radius, 35 inches length of the cord will be unwound.

Note.—If the 60 inches that the carriage runs is supposed to be divided into nine equal spaces of 6⅔ inches each, then the numbers 1 to 9, which are marked on the cord 31 in the frame, shew the progressive lengths of cord which will be given out whilst the carriage runs in each of these spaces, by unwinding from off 2¼ turns around the spiral grooves of the fusee.

Note.—On the extreme end of the axis of the barrel 26, another smaller barrel E, is fixed, and a cord A, which winds round the barrel E, in a reverse direction to the cord 31, is conducted over the suitable leading pulleys B, and loaded with a balance weight D, which acts continually to draw and keep the cords 31 and 35 tight, whilst the carriage is coming out, and when the spur wheel 25 is disengaged from its gear with the pinion 24. At that time the fusee and winding up barrel are turned backwards by the action of the said cord A, and weight D, without producing any effect, except to turn all parts backwards, to bring them to a proper position to commence their action at the next time of running in the carriage. At the commencement of a new set of cops, and whilst the cones of those cops are forming, the front end of the rule v, requires to be moved at every few successive stretches away from the mule head, or towards the left hand, in order to give it more obliquity as the cops increase, and gradually require a more conical form. That regulation of the obliquity of the ruler v, may be made by the attendant to the machine, who can give the ruler v, a little more obliquity at discretion, whenever he observes the threads begin to wind too slack around the cops whilst the carriage is running in, for then, by moving the front end of the rule v, a little further towards the left hand, the threads will be wound tighter at the next stretch. At the commencement of the formation of a set of cops, the rule v, will be required to be thus moved by hand at every succeeding stretch; and also to be moved a considerable space at each stretch; but as the cops advance, and form sensible cones about the spindles, the rule v, will require to be moved less and less at each succeeding stretch, so that after a few stretches have been made, it will not require to be moved any sensible quantity at each stretch, but moving it a very little once in every two stretches will be sufficient, then once in every three stretches, and afterwards once in every four stretches, and so a less and less frequent regulation will be necessary as the cops go on increasing. This discretionary adjustment of the obliquity of the rule, according to the apparent slackness of the threads as they wind up when the carriage runs in, is so very easy to be done by the hand of the attendant, that it is not necessary to apply further machinery to move the rule v. The backward end of the rule v, is supported on a fixed centre pin x, fig. 2, and the other end rests on a fixed arch Y, which has serrated teeth, and the rule v, has two clicks to act therein, and retain the rule from returning or moving back towards the right hand, by the stress which the roller W, exerts against the edge of the rule whilst the carriage is coming out. When the full cones of the cops are completed, the rule V, will not require to be moved again, or only a very little, during all the completion of the set of cops.

In case it may be thought advisable to have machinery for moving the end of the rule V, whenever it requires moving, the parts with the letters K to R, inclusive, in fig. 2, may be added to those already described. A pin K, is fixed to the end of the rule V, and projects downwards therefrom; one end of the link L, is jointed on to the pin K, and the other end is jointed to the extremity of a straight slider X, which is fitted into sockets affixed to the railway T, whereon the barrel wheel runs, so as to be capable of sliding, freely endways in those sockets. The under side of the bar X, has serrated teeth cut in it, to receive the action of the driver N, which is jointed to a short lever M, which is poised on a centre pin, supported by the railway O, and has a heavy tail, which always tends to draw the driver N, backwards along the sloping sides of the teeth, until the farthest retreat of that driver is stopped by the heavy end coming to rest on the floor. The end of the lever M, stands up, so as to be caught by the end of a small elbow lever or dettent P, which is applied to the carriage (and is moveable on a centre pin), whenever the carriage is coming out, but when the carriage is going in, the lever M, is not disturbed. When the elbow lever P, is lifted up, so that it passes over the upper end of the lever M, without touching the same, the said machinery remains entirely out of action. The upright arm of the elbow lever P, is detained by a catch 2, whenever the dettent is intended to be kept out of action; R, is an upright slider, the lower end of which rests upon the tail of this catch 2, and is heavy enough to lift up the other end of that catch, so that it will leave the upright arm of the dettent part at liberty, whereupon its other arm will hang down, so as to intercept and move the other end of the lever M, every time the carriage comes out, but will pass over the ends of the lever M, when the carriage goes in; the consequence is, that the sliding rack X, is moved endways a tooth or two teeth a time, and by its oblique link L, the end of the ruler V, is moved along its arch Y, as is required, and with a more rapid motion at the earlier stretches than afterwards. The upper end of the slider R, is suspended from the wire of the counter faller wire; consequently, when the threads wind slack, from want of sufficient turning motion of the spindle, to gather up the threads as fast as the carriage runs in, the counter faller rises and lifts the slider R, from off the tail of the catch 2, and then that tail being heavier than the other end, will detain the elbow lever P, so as to keep it up out of the way of the top of the lever M, and then no motion will be given to this machinery until the threads begin to wind too tight; the counter faller will then be depressed, and by letting down the slider R, the weight thereof coming to rest on the tail of the catch 2, and overbalancing the same, will let the elbow lever loose, so as to give action to the machinery, as before explained.

Note.—I do not claim the said combination of machinery for moving the rule V, and which is marked in the drawings with the letters from K to R, as one of my improvements.

Note.—I do not claim the rule V, and slider T, by themselves, as my invention, or as part of my present improvements, unless the same are used in combination with the fusee 34, 32, and winding up barrel 26.

Note.—Instead of the cord 35, a chain may be used to pass round the sheave 36, and wind round the barrel part 34 of the fusee, which barrel is not necessary to be a cylinder, but it may be a spiral groove, similar to the upper spiral groove 32. The cord or chain 35 must be fastened to the small or inner end of the lowest spiral curve nearest the centre thereof; the curvation of the upper spiral must be on the contrary direction to that of the lower, if the two fusees join base to base like a barrel. The spiral curvature must be less rapid, and more nearly to a circular figure, when two curves are used, than when one is a cylindrical barrel, and the other a spiral curve, as represented in fig. 2, because the action of the two, when combined, must only produce the same effect in letting out the cords 31, as before described; or a broad strap may be used in lieu of the cord 34, to pass round the sheave 36, and to wrap round the barrel part 34 of the fusee, which must then be cylindrical, but the end of the strap being nailed to the barrel, the strap will coil up around itself, so as to leave somewhat of the effect of a spiral curve below as well as above; or a short chain may be used to go round the sheave 36, the end of that chain being joined to a strong strap, which coils as last mentioned, round the barrel 34, wrapping upon its own coil.

Note.—The roller W, of the slider T, should, when the carriage is quite in, apply to the edge of the rule V, opposite to the fixed centre pin X, which is capable of being set nearer towards, or further back, being mounted in an overhanging forked bracket Z, which is fastened with a screw and a long slit to the railway X, on which the carriage wheel runs.

Note.—And in order that the threads may be caused to wind neatly round the spindles near to the vertices of the cops, a short rule 40, is jointed to the edge of the rule V, to fill up a notch which is cut out in the edge of the rule V, so that the edge of the rule 40 will line exactly with that edge; the jointed rule 40 is pulled out by a spring 41, which is extended from a bracket 42, affixed to the end of the rule V, with a setting screw 43, to strain the spring 41 to any required degree, so as to tend to pull the jointed lever 40 out about its joint to make an angle with the edge of the rule V, in which case, by acting on the roller W, of the slider T, the said spring will pull that slider so much further than the edge of the rule V, would move it as to cause the threads to wind tight about the noses or vertices of the cops, by setting the screw 43; the spring 41 may be strained till it will produce that effect. After the explanation which has been given of the action of the faller in describing the backing off motion, it is not necessary to enter into further description of the action of the parts.

The faller guide K, is let down gradually as the cops increase in size, by means of a double inclined plane H, composed of two wedges F, fixed on a bar G, which is caused to slide endways by a screw K, of 7⅓ threads per inch, which screw has a ratchet wheel L, of 25 teeth fixed on the end of it, whereby it is turned round two of those teeth at a time, at every successive stretch. The parts being represented of a larger size at fig. 4, will serve to construct the work by, and need no further description. The faller guide is represented as broken off.

When the above described is required to spin different numbers of yarn, or to put in a different quantity of twist thereto, the alterations in the parts of the common mule are to be made in the usual manner, taking care that the alterations do not affect the proportion which exists between the number of turns made by the axis of the twist pulley and by the spindles. The ratchet wheel L, of the screw K, which gives motion to the shaper F, must be changed for other similar ratchet wheels with different numbers of teeth, by means of which the screw K, will be turned more or less quickly round, in order that it may move the shaper F, and let down the faller guide K, at such a rate of progress as will suit the increased or diminished rapidity of the growth of the cops, by the accumulation of finer or coarser yarn around them.

Note.—The mule above described, when in regular working order, performs a stretch in 23 seconds of time, whereof 16 seconds of time is expended in the carriage coming out, and in giving twist to the threads, during which time the rim or great wheel makes 55 revolutions, and the spindles make 962 revolutions, which in 60 inches length of yarn, is at the rate of 16 twists in an inch of length of yarn, No. 36 for weft. The backing off occupies three seconds, including the stopping, the motion and the running in of the carriage four seconds; this was observed at about the 50th stretch, but after 350 stretches have been made, each stretch is performed in about 22 seconds, because the backing off then takes one second less time.

Note.—Although I have selected by way of example for the previous description, a mule for spinning fine cops for weft, my improvements are equally applicable to mules for spinning twist on larger cops, and also to mules for spinning finer numbers of yarn than above stated; and also my said improvements are equally applicable to those mules which have drums in their carriages for turning the spindles, or to those mules which have long horizontal cylinders in their carriages to turn the spindles; I have rendered mules of both these descriptions self-acting by the application of my improvements thereto, and with equal success.

The proportions and dimensions of the parts of the winding up motion hereinbefore stated were originally set out in order to apply to mules with long horizontal cylinders in the carriages, and were made to act correctly in mules of that description, in which mules the spindles make about from 17 to 20 turns of the spindles to one turn of the rim or great wheel, and about seven or eight turns of the spindles to one turn of the twist pulley, and the spindles make from 10 to 13 turns during the running in of the carriage, if the twist pulley is held motionless. When I have applied self-acting machinery, made by casting the parts from the same pattern, so as to be the same in dimensions and proportions as are hereinbefore stated; to mules with drums in the carriages I have applied a pair of bevel wheels in the carriage, to transmit the motion from the end pulley F, to the drums in the carriage, that pulley being placed nearly in the same position as if the mule had a long cylinder.

The small bevel wheel on the horizontal axis of the end pulley F, has 24 teeth, and it turns a bevel wheel of 45 teeth on an axis, which is placed in an inclined position, parallel to the bevel of the spindles and of the drums, and which axis has a pulley upon the upper end of it to turn the drums by a drum band. The said bevel wheels are in no way necessary to be introduced into the carriage of a mule with the drums, in order to apply my improvements thereto, but having introduced them into those mules with drums in the carriage, which I have rendered self-acting by aid of my improvements, in order to save the trouble of making other alterations in the speeds, I have thought it better to represent the mule in the drawings as it really is working, although the use of bevel wheels in the carriage is not to be recommended. Any mule may be rendered conformable to the proportion and dimensions stated at the commencement of the specification, and then the self-acting machinery hereinbefore described will apply correctly thereto.

For the kind of mules commonly called box organ mules, the usual machinery at the back of the roller beam, whereby that kind of mule is put in motion, should be removed, and a common mule head frame and machinery substituted, something after the fashion of that represented in the drawing, or any other approved pattern for a common mule head, and then the self-acting machinery hereinbefore described will be applicable thereto. There will be no material differences to be made in the self-acting machinery hereinbefore described when the same is applied to mules with the wheels in the middle of the length of the carriage.

A new improvement in the mode of working a pair of mules with self-acting machinery together, by means of which improvement the two mules will be caused to keep proper time one with the other, in the coming out and putting up their carriages respectively, in order that the children, termed piecers, may have time to piece up or mend the ends of the broken threads in one mule before the other mule required their attention for that purpose; and that the carriages of the two mules can never at the same time be in that situation which the piecers usually choose for piecing the broken ends; therefore their attention can never be distracted between the two mules, by both requiring piecing at the same time. In place of the wire before mentioned, which connects the lever z, with the arm of the elbow lever 16, of the backing off motion, a curled wire spring must be substituted, and a small detaining latch must be applied on a centre stud pin, which is fixed in the framing of the mule head, in such a position that it will fall by its own weight in the way of the other lever 16 of the backing off motion, so as to detain and hinder that elbow lever from acting in the manner hereinbefore described, viz. to shift the backing off strap 14 from the loose pulley 15 to the fast pulley 5, notwithstanding that the finger *g*, on the axis *c*, has acted to give motion to the said elbow lever, because the spring which is substituted for the wire to connect the lever z, and the elbow lever together, will yield and extend without moving the elbow lever; therefore the said strap 14 cannot be stripped in the manner hereinbefore described, in order to commence the backing off, unless the said detaining latch is first lifted so as to release the elbow lever 16 from the detention which the said latch occasions, to the action of the elbow lever 16, and, consequently, to the commencement of the breaking off.

The said detaining latch is connected by a wire or small rod with a jointed dettent, moveable about a fixed centre of motion, which is situated in any place near the floor where the carriage of the other mule will pass over the said jointed dettent; and the same is so situate in respect to the coming out of the carriage of that mule, that when the said carriage is come so far out that it becomes inconvenient for the piecers to reach over the carriage, to piece the ends of that mule up, then, but not before, the carriage or some part affixed thereto, will bear down the said jointed dettent about its fixed centre of motion, and pull the wire connected with the aforesaid detaining latch of the first mentioned mule, in the manner of pulling a bell wire, so as to release the elbow lever 16 of that mule from its detaining catch, whereupon, but not before, the coiled spring which is used in place of a wire to connect the lever *z*, with the elbow lever 16, will draw the lever in contracting, and will shift the backing off strap 14, from the loose pulley 15, to the fast pulley 5, whereby it will put the backing mechanism of the first mentioned mule in action, and then that mule will begin to put up.

The improvement being applied to both the mules, which are to work in a pair by self-acting machinery, according to my improvements, will prevent the carriage of the said mule from putting up, until the carriage of the other is got so far out that the piecers will have no further occasion to attend that mule, but by turning round they will find the other mule just put up, and beginning to come out again, and therefore in a proper position for them to piece up the ends.

Note.—The said jointed dettent must give way to the carriages when they strike the jointed parts of the latches in going up again, so as not to pull the wires or links to the detaining latches, when the carriages are going in, but only in coming out.

Having now described the construction and operation of the whole combination of the machinery, which I have used, and which I recommend to be used for rendering mules self-acting according to my improvements, I shall proceed to point out what I claim as my improvements.

First, in respect to the machinery for backing off, I claim as one of my improvements the combination hereinbefore described of those parts which are marked in the drawings, with the numeral characters from 3 to 21, inclusive, which combination so marked performs the office of stopping the motion of the wheel, and of the spindles without needless loss of time, and without violence; and after having stopped the motion, it then turns the spindles round backwards until a proper quantity of the threads are backed off or unwound from the upper parts of the spindles when they rise up above the vertices of the cops.

The essential and new properties of the combination which I do not claim, in respect to backing off as one of my improvements, is that the machinery whereby the backwards motion is to be communicated from the moving frame to, the spindles, shall in some part of the train of communications be provided with two distinct means of connecting and disconnecting, the communication of the backward motion, and being for the purpose of commencing the said motion, and the other for the purpose of discontinuing the same ; the former being an endless strap or belt to act on a pair of fast and loose pulleys, whereof the fast pulley is so connected with the spindles by intervening machinery, that it must turn round one way, when they turn forwards and the contrary way, when they turn backwards ; and the endless strap when prepared for backing off previously to commencing, that operation is on the loose pulley, and moves the same way as the first pulley is to be turned, in order to back off, but the contrary way to that in which the said fast actually does turn by the swing or energy of motion in the moving parts previously to commencing the backing off. The commencement of the backing off is made by shifting the said endless strap from the loose pulley to the fast pulley, whilst the fast pulley is turning round the contrary way to that in which the endless strap moves. By that means the endless strap first assists to stop the motion that the machinery preserves by its swing or energy of motion. After the common driving strap of the mule has been cast off, and the stopping of the remaining forward motion of the machinery being thus performed by the said endless strap and fast pulley without violence, or needless loss of time, they then begin to turn the spindles backwards.

The means of disconnecting the backwards motion so produced must be distinct, as above stated, from the said fast and loose pulleys, by which the backwards motion has been commenced, and the disconnecting should be of the nature of toothed gear, which communicates the motion by the contact of metal teeth, which teeth being withdrawn from their contact, will cease to communicate the motion. The object I have aimed at is that the commencement of backing off shall be begun with an easy and quiet action of shifting an endless strap from a loose to a fast pulley, in order to assist in stopping the previous motion, and then to turn back; but nevertheless, that the cessation of the backing off motion so commenced and produced shall be made by an instantaneous action of what is called throwing teeth work out of gear. But note, in other self-acting mules, the cessation of the backing off has been effected by throwing toothed work out of gear, and I do not claim that by itself as a new improvement, but only the use of fast and loose pulleys, applied under the conditions hereinbefore stated, for commencing the reverse motion without violence as aforesaid; but as an endless strap cannot be thrown off instantaneously, the termination of the motion so commenced should be made by throwing toothed work out of gear, therefore I use two distinct means for connecting and disconnecting as before stated, whereof that for connecting consists of a fast and a loose pulley as aforesaid; and note, I make no claim to that part of the combination of parts hereinbefore described for backing off, which is marked in the drawings with two small letters of the alphabet, viz. from *i*, to *y*, being those parts or combinations of parts which cause the faller wire to be put down with a motion corresponding to the unwinding of the threads during the backing off, in order that the faller wire, with the assistance of the counter-faller wire, may take up the slack of the threads, and keep them to a proper tension.

A very similar combination of parts is in use in other self-acting mules. In respect to machinery for running in the carriage, I make no claim whatever. Secondly, in respect to machinery for winding up the threads, I claim as one of my improvements, the combination of all those parts which are marked in the drawings with numeral characters from 24 to 38 inclusively, which combination so marked performs the office of turning the spindles round during the running in of the carriage, in order that the spindles may wind up the threads in spiral coils around the cops. The said turning round of the spindles during the running in of the carriage being performed with an accelerating motion, that is, with a continually increasing rapidity of angular or turning motion during the running in of the carriage, the rate of that acceleration or rate of increase in rapidity during such running in of the carriage being suitably adopted to the diminishing length of thread, that is, wound up by each of the successive coils which the threads must make around the conical cops, as those cops ascend spirally from the bases of the cones towards the vertices thereof, and hence the said rate of acceleration or of increase in rapidity will be least at first when a new set of cops are begun on the spindles, and will become greater as the cops increase, and become more and more conical until the full one of those cops is completed; and further, the said combination causes the spindles to make a small number of turns during the running in of the carriage at every succeeding or at every few succeeding stretches or times of winding on a layer of threads around the cops from the commencement of a new set of cops, until the full cones of those cops are completed; and note, I do not claim the part included in that combination which are marked in the drawings by the capital letters of reference from T to Y inclusivey; because a rule, similar in its form and its properties to that which I use, and which is marked V, in the drawings, together with a slider T, to be moved by—that ruler was invented some years ago by Mr. De Jongh, and is fully described by him in the specification belonging to a patent, which was granted to him, dated the 18th day of December, 1826, viz. a straight rule, to be placed horizontally beneath the carriage of the mule, with the length thereof in the direction of the rim of the carriage, but capable of being placed more or less obliquely to that direction at pleasure, in order that the edge of the said rule may act in the manner of an inclined plane upon a roller or rollers, borne by a slider, which is fitted to slide horizontally in a groove fixed beneath the carriage, in the direction of the length of the carriage.

To such a rule and slider I make no claim; but the essential and new properties of what I do claim, in respect to winding up, as one of my improvements, is the means of communication of motion, hereinbefore described, and marked in the drawing Fig. 1. with the numeral characters 31 to 38 inclusive, whereby the motion of the said slider T, in its groove during the running in of the carriage, is caused to diminish or augment in a greater or lesser degree; and also with a rate of acceleration corresponding to that degree, all that turning motion which the spindles derive from the running in of the carriage, partly by the ordinary action of the drum band and end pulley E, and still more from the action of drawing off the cord 31 from off the winding up barrel 26.

In order that the turning motion which results from the action of the combination, when diminished or augmented by my means may have an accelerated motion during the running in of the carriage, which accelerated turning motion will be suitable for winding the threads around conical cops, that is to say, when the slider T, (which I do not claim,) is caused by my means 31 to 38 aforesaid, to deduct or add very little from or to the said turning motion of the spindles, then but little variation will be made in the acceleration of the turning motion, which results as aforesaid, but the more the said slider is caused by my said means to so, deduct from or add to, the more the resulting motion will have the quality of acceleration given to it; because by means of the spiral curve 32, of the groove of the fusee, all the motion which that fusee transmits in augmentation or diminution of the turning motion which is given by the action of the end pulley, and of the winding up barrel 26, is accelerated motion, and gives the quality of acceleration to the resulting motion in a greater or lesser degree, corresponding to the actual quality of the turning motion which results; for instance, if the inclined rule V, is set so as to give no motion to the slider T, in its groove, then no augmentation or diminution will be given to the turning motion, nor will their turning motion have any acceleration given to it. But if the rule is set at a considerable obliquity to the motion of the carriage, as in Fig 1, so as to give a considerable motion to the slider T, in its groove, then the turning motion which is by my said means, transmitted therefrom to the spindles being in diminution of the turning motion, will cause the resulting motion to be but few turns of the spindles, but they will turn with a rapid rate of acceleration during the run in of the carriage. What I above called my means of communication of motion, for the slider T, in its groove to cause diminution or augmentation of the turning motion of the spindles, viz. the combination marked in the drawings 31 to 38, inclusive, and whereof the spiral groove of the fusee is the principal member, has the property of producing accelerated turning motion of the spindles from uniform rectilinear motion of the slider T, in its groove under the carriage, which will be illustrated by a simple experiment, viz. suppose the carriage to stand still and be out, and the winding up barrel 36, to be in order by its wheel 25, and pinion 24, in that case, if the end of the rule V, is moved along its arch Y, from one end to the other, that motion of the ruler will cause the spindles to turn round, and also they will turn quicker and quicker as the ruler becomes more and more oblique; whereas, if the same experiment were made upon the machinery of Mr. De Jongh's specification aforesaid, no motion whatever would be given to the spindles, but they would stand still.

Note.—A winding up barrel and cord with wheel and pinion, together with a reverse cord and counterweight similar to that which I use, and which are marked 26, 31, 25, 24, and also A, unto D, in the drawings, has been used before in self-acting mules, in order to give a turning motion to the spindles by pulling a cord 31 off therefrom by the motion wherewith the carriage runs in. I make no claim to the parts 26, 31, 25, and 24, also A, to B, except when the same are used in the combination of the parts marked 24 to 38, which I have claimed as aforesaid, and of which combination, the new and essential properties have been set forth above. Lastly, I claim as one of my improvements, the detaining latch and parts hereinbefore described, for compelling a pair of mules which are to work by self-acting machinery, according to my improvements to keep, proper time, one with another, to suit the convenience of the piecers hereinbefore set forth.—[*Inrolled in the Petty Bag Office, November*, 1831.

Specification drawn by Mr. Farey.

[In the commencement of our report on Knowles's specification, we observed that the subject was about to be submitted to legal investigation. An injunction has been obtained in the Court of Chancery, by Messrs. Sharp and Roberts, of Manchester, prohibiting Mr. Knowles from exercising his invention of a self-spinning mule, on the plea of his having infringed upon the patent right of Mr. Roberts, granted to him 29th March, 1825, (for specification of which, see Vol. XIII. page 6, of the First Series of our Journal). On a motion to dissolve the injunction, after several days argument before the Lord Chancellor, his Lordship delivered the following judgment] :

COURT OF CHANCERY,

Lincoln's-Inn Hall, 21*st July,* 1832.

ROBERTS *v.* KNOWLES.

Observations by the Court, &c. at the conclusion of the arguments at the Bar.

Brougham, C.—Now, I want to know this,—for you Sir Edward Sugden are for the plaintiff—I want to know what difficulty there would be;—this is now Saturday the 21st,—this day three weeks will be commission day at Lancaster, and the assizes there last a fortnight, so that there is at least a month, a clear month, between this and the timeat which it might come on for trial here;—I want to know, [suppose I was to continue the injunction, which of course it is to be understood I mean to do on terms;] what difficulty there would be in trying this at Lancaster in the last week of the assizes? You see a great bulk of your witnesses are to be found in the county palantine, the others are engineers in London.

Sir E. B. Sugden.—My Lord, we have no difficulty, I understand, about it.

Brougham, C.—Well then, how are you on the other side?

Mr. Solicitor General.—My Lord—

Brougham, C.—How do you feel as to that—for there has been a great delay on your part, between the granting of the injunction, four months; no doubt the affidavits, and particularly Mr. Farey's affidavit, would take a considerable time in being prepared; but four months, at least, from the granting the injunction, till the time you applied to have it dissolved.

Mr. Solicitor General.—Why, my Lord, as your Lordship knows very well, it was thought right to have, in a case of this sort, affidavits of the most eminent persons in the department of life to which they belong, and there is always a difficulty and delay in procuring their evidence.

Brougham, C.—No doubt; but what difficulty would there have been at trying this at these assizes.

Sir E. B. Sugden.—We are quite ready.

Brougham, C.—Two courses;—suppose I should continue the injunction about which I have still some doubt—two courses there are, one of which may be taken; the one is, to have it tried in the Court of Exchequer, or in the Court of Common Pleas, after next term. I would take one of those Courts, if it were to be tried here; the other would be to have it tried at Lancaster, which would be still better, as it is very desirable to have it tried as soon as possible.

Mr. Solicitor General.—I am sure, my Lord, I am not able, at this moment, to say how far my clients would be able to get ready.

Brougham, C.—In any event, I shall look into it, on the ground I am now going to mention, and state, at the sitting of the Court, on Tuesday morning, what I think of it.

Mr. Solicitor General.—Mr. Farey states to me that he will be so occupied—he will have to be at Cornwall and some other places, so that he does not think he will be able to be there but with great difficulty.

Brougham, C.—The learned Judge would accommodate the parties with respect to witnesses. The trial might be put off from next Monday four weeks to next Friday four weeks probably, and that might be in time for it to be tried.

Mr. Solicitor General.—Perhaps your Lordship will allow us to have till Tuesday morning, to consider of it upon that point only?

Brougham, C. — Yes, certainly. Well then, upon the whole matter, it is impossible for me to say that if I had seen the whole evidence now produced on the other side, that if it had been before me at the time the injunction was applied for, I should have granted the injunction;—I do not say I am clear upon it. It is also clear that if upon an early application to dissolve the injunction I had seen these affidavits, the probability is I should have dissolved it, and have left the parties to proceed at law; but when I take into my consideration the delay of four months, that certainly very much influences my mind; nevertheless, I shall look into the whole of the matter between this and next Tuesday morning, when I shall say whether I shall continue the injunction or not; if I do continue it, it will be upon the terms of the plaintiff's proceeding at law immediately.

Mr. Solicitor General.—We shall probably be able to ascertain between this and then what we shall be able to do.

Brougham, C.—I have referred more than once to Mr. Farey's affidavit—it is a very important affidavit; nevertheless, I must say Mr. Roberts's invention is a very ingenious invention, a very original one, and it is not upon the specification I have my doubt, it is chiefly upon the identity of the operation with that of the defendant's that I have my doubt; but I shall look into that again. I look upon the delay to have been very material in this case.

Mr. Solicitor General.—It has been very unfortunate for us, certainly.

Brougham, C.—The impression, the present impression on my mind is, that I shall be disposed to continue the injunction upon the somewhat strict terms of putting it upon the plaintiff immediately to proceed at law. I shall mention it at the sitting of the Court on Tuesday morning, that there may be no loss of time. Let me have the specification and the affidavits.

Sir E. B. Sugden.—We ought not to lose a moment.

Brougham, C.—When I say the identity of the operation in that case of Roberts and Knowles, I wish not to be misunderstood; it is particularly that part of it that I allude to in which the fusee and the diagonal bar come in the place of the radial arm of the other.

Sir E. B. Sugden.—Yes, my Lord, but we do not; I am sure your Lordship understands that we do not dispute that part with them.

Brougham, C.—Oh, I am quite aware of that, but the question is, whether the giving of the variable motion, that being the gist of the thing, in that way be the same? It is upon that that I wish to look at the specification and the affidavits. You do not go against them for the diagonal bar, I know.

Sir E. B. Sugden.—Certainly not; we admit they have a mode of adjusting the rotatory motion different from ours, and we do not find fault with that, but we object to their taking the means.

Brougham, C.—Which, in short, you say are the same as yours.

Sir E. B. Sugden.—Exactly; I may ask whether your Lordship would like to have the models.

Brougham, C.—No; I think I have the models so completely in my mind, that if I have the specification and the plans annexed to it, and the affidavits, I shall do. You see if I were to take the models, I must have one professional gentleman on each side to attend me, and that is very inconvenient in the absence of counsel—it is much better not.

Sir E. B. Sugden.—Yes, probably it is.

Brougham, C.—I must have the affidavits to-day before the rising of the Court, because I shall read them this evening.

Court of Chancery, Lincoln's Inn Hall, 21*st July,* 1832.

ROBERTS *v.* KNOWLES.

JUDGMENT.

Brougham, C.—Now,—are the parties here in Roberts and Knowles?

Mr. Oates.—They are not come yet on our side, my Lord.

Brougham, C.—They ought to have been here.

Mr. Oates.—They are gone for.

Brougham, C.—But they ought to have been here by this time, it stands first in the paper;—well, we must mention it when the learned counsel come into court. Oh, here is one of them. Mr. Duckworth is coming.

Mr. Cooper.—Mr. Duckworth on the other side is now here, my Lord.

Brougham, C.—Yes, I see he is; and Mr. Solicitor General is also just coming up the Hall.

Now, Mr. Solicitor General, in this case of Roberts and Knowles, a further consideration of the patents for the two processes of making the machines, and of the whole matter, has considerably lessened the doubt that I had, and which I expressed when I was last here at the latter part of the arguments; nevertheless, it still appears to me to be a case quite fit to be tried, and it seems to me to be quite as possible to try it at these assizes.

When I say, considerably lessened the doubt that I had, what I mean is, that it has mended my opinion of Mr. Roberts's case on the latter point as to the identity. However, it is perfectly fit that I should not enter further into the case just now, because it is agreed on all hands it should be tried, and the question simply is, how soon it can be tried?

Now, I was disposed to say on Saturday that it ought be tried, —and the plaintiff has no objection to that,—that it ought to be tried at these assizes for the county of Lancaster. It certainly is very desirable that it should be tried as speedily as possible; nevertheless, I incline to lay him under the terms to continue the injunction, and to lay the plaintiff under the terms of proceeding to try it at these assizes for the county of Lancaster; *unless within a week from this date the defendants shall give notice that they prefer not having it tried at these assizes; because, from what has passed, it has occurred to me that they may be better prepared than you are, Mr. Solicitor General; indeed, they are perfectly ready, and from what I know of the business there there might be abundance of time for you to get ready, for I think it might be tried this day four weeks, or to-morrow four weeks, and therefore there might be abundance of time for you to be ready; nevertheless, it is possible there might not, therefore you must give them notice within a week whether you will prefer to go to trial then or not, and that will be sufficient, Sir Edward Sugden?

Sir E. B. Sugden.—Yes, my Lord.

Mr. Solicitor General.—Why, my Lord, nowithstanding the great inconvenience that will result to us from being tied up by the injunction, should we not proceed to trial immediately, yet I think, considering the difficulty there will be in getting prepared for trial for these assizes, the better way will probably be to have it tried in London.

Brougham, C.—Then I was just going to make the observation, that as a great many of your witnesses, and almost all your skilful men live in London, it might be as well that you should try it here, and then the only question is as to the state of the paper in the common law courts. If the action was brought in the Court of King's Bench, probably it might be twelve months before you could try it, therefore, to have it tried here, I would lay them under terms not to try it in the Court of King's Bench, but to try it in the Court of Common Pleas, or in the Court of Exchequer.

Mr. Knight.—In the Court of Exchequer, if your Lordship pleases.

Brougham, C.—Very well.

Sir E. B. Sugden.—No, no; I do not know why we are to be bound to go into any one particular court. You cannot compel me to consent just to go into the Court of Exchequer, and no where else.

Brougham, C.—Very well, we will say either the Court of Exchequer, or the Court of Common Pleas. I believe that either will give you about equal priority in point of date. In Middlesex, you know—in Middlesex, Sir Edward Sugden?

Sir E. B. Sugden.—Yes, if your Lordship pleases.

Brougham, C.—Because it saves time to go there.

Mr. Solicitor General.—And then, my Lord, if it should be necessary, the court will do what it frequently has done in cases of this sort—give directions for the necessary parties to be at liberty to inspect the machines, though I do not think that will be found to be necessary.

Brougham, C.—Oh, yes; but I do not think there will be the least difficulty of accession on either side.

Sir E. B. Sugden.—None.

Mr. Solicitor General.—No, no, I dare say not. The parties are all dealing fairly.

Brougham, C.—When I said, that a little further consideration of the case by myself had somewhat improved my opinion of the plaintiff's case, and left my opinion as to the identity less doubtful, I ought to have stated, that nothing could have been more able than the arguments of the learned counsel for the plaintiff; but sometimes having a little time to look into details, enables one to pick up things which they do not always lay hold of from the bar, and so it was here.

To Robert William Sievier, *of Southampton-row, in the parish of St. George, Bloomsbury, in the county of Middlesex, gentleman, for his having invented or discovered certain improvements in the making or manufacturing of cables, ropes, whale fishing and other lines; lathe and rigging bands; bags and purses; parts of which said improved articles are applicable to other useful purposes.*—[Sealed 1st December, 1831.]

This invention consists in the application or employment of filaments, threads, or strands of caoutchouc or India rubber, to or for the making, manufacturing, or constructing of elastic cables, ropes, whale fishing and other lines, lathe and rigger bands, bags and purses; such filaments, threads, or strands of caoutchouc or India rubber, being previously platted over or covered with hemp, flax, silk, wool, cotton, catgut, Indian grass, strips of leather, or other fit and proper materials, part of which articles, when so manufactured, are applicable to various other useful purposes.

As filaments or threads of India rubber, covered with cotton, silk, and other materials, are now commonly used in the manufacture of many articles where elasticity is required, and as such filaments or threads are covered with the different materials by various kinds of machines applicable to the purpose, it is not necessary for me to describe any particular machinery by which the filaments, threads, or strands of India rubber, required for the different articles to be manufactured in my improved manner are to be platted over, intermixed, or covered with the materials. I therefore shall only state generally, that the filaments, threads, or strands of caoutchouc, are prepared by cutting them from any convenient sized or shaped piece of India rubber into long strips, which are afterwards stretched to their utmost tension, and wound upon drums, reels, or bobbins, ready to be platted over or covered by, or interwoven with, the various materials before mentioned.

This may be done by any proper machinery, such as those used for making sash lines, braiding, platting, or stay lace machines, or any other machinery of the like description, which will cover the filaments, threads, or strands, with the different materials in the manner of winding, platting, netting, knitting, laying, or interweaving, or any such other kind of fabric or manufacture, which will allow of the filaments, threads, or strands, when so covered, stretching, or collapsing in their length to the degree of elasticity required, without injuring their tenacity.

The filaments, threads, or strands, after being prepared by platting over, covering, or intermixing them with any of the different materials, as above described, either singly or mixed, are for the manufacture of any of the various articles above mentioned to be platted, netted, knitted, laid, or interwoven one with the other, by any kind of machinery applicable to the purpose, or they may be used in the same manner, without covering them with any coating of the different materials.

The number of filaments, strands, or threads to be so combined, and the positions of them, depending upon the different kinds of article to be manufactured. For instance, in the manufacture of cables, ropes, or other articles where great strength and elasticity is required, the filaments may be passed through different machines, each machine taking the strand or cord of filaments, as prepared by the foregoing machine, and platting, netting, knitting, laying, interweaving, or otherwise combining any number of such strands or cords again into one strand or cord, and so on, until the article is composed of such a number of filaments, threads, or strands, as are necessary for its required strength

In order that my improved manufacture of the various articles above mentioned may be better understood, I shall proceed to describe the principle of constructing the same, that is, of the methods or manners in which the single filaments are combined, by laying, interweaving, knitting, or netting, so as to form the completed article, and I have hereunto annexed several diagrams, which will serve to illustrate the same: reference being had to the figures and letters marked thereon; that is to say,

Having prepared any number of the filaments or threads of the caoutchouc or India rubber, they are severally to be coated or covered with any of the above named, or other proper materials, by means of winding, platting, braiding, knitting or netting machines, or any other machinery which will cover them with the different materials, in such a way as to allow of their stretching or collapsing in their length.

Plate IX. fig. 1, may be considered as an end view or section of one of these filaments or threads, as it would appear when cut asunder; seven, or any other number that may be thought desirable of these filaments, are then taken and placed, as in fig. 2, and in the side view fig. 3, and are covered with a coating of any of the proper materials, by means of a platting, knitting, netting, winding, laying, or other machines, thus forming a strand or cord, which may be used as a sash line, whale fishing, or other lines, lathe, or rigger bands, according to the size of the filaments used. These strands or cords of filaments, are also capable of being formed with others of a similar description into a cable rope, band, or line, in various ways, either by placing them together in straight lines, and covering them with a coating of the various materials, knitted, netted, or platted, or wound upon them; or instead of being placed straight against each other, they may be platted, knitted, or netted, laced or interwoven one with the other, as figs. 6 and 7, or so connected together as to render an external casing or coating unnecessary.

Fig. 4, shews seven of the strands or cords of filaments, as formed in figs. 2 and 3, which may be connected together by a coating of single filaments, or they may be covered by strands or cords of a greater number of filaments, or of cords or strands of the different materials above mentioned, or any other description of coating which will allow of the free action of the elasticity of the India rubber. The interstices between the strands must be filled up with any suitable sized filaments or strands, prepared as above. There may be seven of the strands or cords, as last described, connected in like manner, so as to constitute a large rope or cable; fig. 5, is a section of a rope or cord, composed wholly of filaments, as at fig. 1, without being combined, as above described, which may be covered, as above stated.

My improved bags and purses are composed of knitting or net work, made of strands or cords of the filaments prepared, as above described, and which is capable of being made into purses or bags by hand; or the filaments, strands, or cords, prepared as above described, may be knitted, netted, or platted into purses or bags, by machinery or by hand. As there are so many descriptions of bags to which these improvements in the construction may be applicable, it is not necessary to state further, than that in any case where elasticity may be required, the bag or purse may be made wholly of the above materials, or only parts used; for instance, in making carpet travelling bags, I should only form the ends or edges of the bag of the elastic material, covered, when stretched to its utmost extension, with leather, or other suitable substance, which will be capable, on collapsing, of drawing up the leather, or other covering, into puckers or gathers, so as to allow of the bag enlarging very considerably, when any extra quantity of articles are put into it.

Having thus described the process, and the kind of machinery which may be used for platting over, covering, or intermixing, the filaments, threads, or strands of caoucthouc or India rubber, with hemp, flax, silk, wool, cotton, catgut, Indian grass, strips of leather, or any other fit and proper material; and also some of the modes or methods of combining such filaments, covered as above described, for the constructing or manufacturing of cables, ropes, whale fishing, and other lines, lathe, and rigger bands, bags or purses, I desire it to be particularly understood, that I do not wish or intend to claim as my invention, any part of such machinery used for so platting over, covering, or intermixing the said filaments, threads, or strands of Indian rubber, as it is well known and in common use; and as any kind or construction of machinery capable of covering them, by knitting, netting, platting, or intermixing, will answer the purpose desired. Neither do I intend to claim the machinery, or confine myself to the manner or mode of combining such filaments, threads, or strands of Indian rubber, to produce the articles above mentioned, as I am aware there are many other ways of manufacturing cables, ropes, whale fishing and other lines, lathe, rigger bands, bags and purses, from filaments of caoutchouc, prepared as above described. But I wish it to be understood, that I do claim as my invention, the application of filaments, threads, or strands of India rubber, in the making or manufacturing of cables, ropes, whale fishing and other lines, lathe and rigger bands, bags and purses, in the manner herein particularly described.—[*Inrolled in the Rolls Chapel Office, June,* 1832.]

Specification drawn by Messrs. Newton and Berry.

To Robert Stephenson, *of Newcastle-upon-Tyne, Northumberland, engineer, for his having invented an improvement in axle and parts which form the bearings at the centres of the wheels for carriages which are to travel upon edge railways.* [Sealed January, 1831.]

These improvements in the axles and parts which form the bearings at the centres of the wheels for carriages, which are to travel upon edge railways, consist in fixing two ofth said carriage wheels fast upon the extreme ends of a long hollow, or tubular axis, within which a solid central axis is inserted, extending through all the length of the hollow—and projecting out sufficiently beyond the end of the hollow axis, to enable the weight of the carriage to be supported upon the projecting ends of the solid central axes, around which the hollow axis turns, together with the two wheels, which are both fastened upon the ends of the hollow axes.

In the carriages now used upon the Manchester and Liverpool railway, each pair of wheels are fixed fast on the two opposite ends of a long solid axis, which revolves with the wheels, and the two extremities of the solid axis, which project out through the centres of the wheels, are formed into pivots, or gudgeons, and are received in suitable sockets, wherein the weight of the carriage is borne by the hollows or concavities of those sockets pressing downward on the pivots.

In travelling with great rapidity, the said pivots require a copious supply of oil, much of which is wasted, because the hollows or concavities of the sockets (which do not revolve) are inverted, in order that they may bear downwards upon the upper parts of the circumferences of the revolving pivots of the axis, consequently the oil has a tendency to run down and escape from the places of bearing where it is wanted. According to my improvements it is the central axis, which does not revolve, and it is the lower parts of the circumference thereof which apply and bear downwards within the hollows, or concavities of the hollow, which does revolve around that central axis, consequently the oil has a tendency to run down into the places of bearing where it is wanted, the action thereof being (in that respect) the same as in the axles and boxes of common coach wheels, wherein the axle does not turn round, but the box in the centre of the wheel turns round about the axle.

For travelling on edge railways, the wheels on the opposite side of the carriage require to be firmly united, so that they will turn round together in pairs, in order to prevent one wheel from advancing either faster or slower along one rail than the other wheel advances along the other rail. On the common plan of coach axles and boxes, the wheels of each pair being quite independant one of another, one wheel can turn round without the other wheel, and hence such axles and boxes are unsuitable for the wheels of carriages which are to travel upon edge railways, and hence the mode above stated has been introduced, *videlicit*, that of fixing each pair of wheels upon a solid axis, which turns round with them and compel them both to go together, according to my improvement of fixing the two wheels upon the extreme ends of a long hollow, or tubular axis as aforesaid ; the pair of wheels are firmly united together, so that one wheel cannot advance more along one edge rail than the other wheel does along the other rail, and that circumstance (which is an important condition for travelling with safety and rapidity on edge railways), is combined with the advantage of the ordinary coach wheel axles in respect to their supply of oil, viz. that the bearing of the solid axis, which does not turn round presses downward into the hollows, or concavities of the hollow sockets, which turn round with the wheels, giving the oil a tendency to insinuate itself between the bearing surfaces.

In Plate IX, is represented so much of a carriage, which is to travel upon an edge railway, as is necessary to explain my improvements. Fig. 8, is a lateral elevation of a four-wheeled carriage, suitable for conveying goods on an edge railway, showing the two wheels *a, b,* which follow each other along the same rail *d,* of the railway. Fig. 9, is a transverse section answering to the former figure, and shewing one of the pairs of wheels *a, b,* which are at the opposite sides of the carriage, one running on one rail *d,* and the other rail *e.*

The pair of wheels must be united together as before mentioned, and that is done by means of the long hollow, or tubular axis 1, the two ends of which are inserted and firmly fastened into the central holes of the two wheels *a, c*, so as to keep them at the proper distance apart, to suit the space between the rails *d, e*, and to keep them firmly vertrical when they turn round. One of the wheels *a*, is represented in section, as if it were cut through the centre by a vertical plane to expose the interior parts, and that section is repeated on a larger scale in fig. 11.

To explain the structure of the part s 2, is the central solid axis which passes through the interior of the long, hollow axis 1, but which central axis does not turn round. It is enlarged a little at the parts which form the cylindrical bearings 3, which are contained within each of the ends of the hollow axis 2, where the wheels *a, c*, are fixed on the outside thereof. The middle part of the solid axis being rather smaller in diameter than the cylindrical bearing parts 3, 3, a space is left vacant all round the solid axis within the hollow axis, to contain a stock of oil. When that stock requires to be renewed, a supply of fresh oil is poured into the vacant space through two holes at 4, 4, which are then stopped very tight by screw plugs. When the carriage is in use, the oil makes its way from the middle parts of the hollow axis, towards each end thereof, where the bearings are, and thereby the bearing surfaces are kept constantly supplied with oil. The ends of the central axis, which project out beyond the ends of the hollow axis, are also smaller in diameter than the [cylindrical bearing parts as shown at fig. 11.

The weight of the carriage is supported upon those projecting ends 5, each of which is for that purpose received in a socket *f, f*, made in two halves, screwed together, as shewn in figs. 10, 11, and fig. 12, by four small bolts *z, z*, and also by the two staple bolts *y, y*, which fastens the springs *g*, down across the upper flat sides of the socket *f*, and the pressure of all those screws binding the two halves of the said socket *f*, firmly together around the end *f*, of the solid axis, fastens the socket to the axis.

The outer end of the socket *f*, is fitted into a vertical groove, formed in the space between the two prongs *x, x*, of a forked plate of iron, which is screwed to the horizontal side rail *h*, of the carriage, as shewn in fig. 12, and projects downwards therefrom. The ends of the spring *g*, apply to the underside of the side rails *h*, and bear the weight of the carriage, the middle part of the springs being borne upon the socket *f*, to which they are fastened, as before stated; and when the springs bend (by the jolting motion of the carriage in passing over the joinings of the rails or uneven places) the sockets *f*, rise and fall in their verticle grooves.

To confine the hollow axis with the wheel from having any unnecessary end-play on the solid axis, circular plates or rings of metal, are fastened one against each end of the hollow axis, being bolted fast to the flat surfaces of central bosses or naves 1, of the wheels, and those rings having small circular projections, which enter a little way into the ends of the hollow axis (as shewn at fig. 11) those projections apply to the shoulders, which are formed on the solid axis by the enlargements 3, 3, which form the cylindrical bearings thereof.

The central hole through each of the rings 6, is only just so much larger than the end 5, of the solid axis as to allow of a free turning motion, but the central projection, which enters into the end of the hollow axis, is fitted very tight therein. A large washer of leather is interposed between the flat surface of the ring 6, and the corresponding flat surface of the central boss, or nave 1, of the wheel, and the ring 6, is bound fast thereto by screw bolts 7, 7, which pass through the boss 1, of the wheel, having their heads countersunk into the ring 6, and having nuts screwed on their opposite ends, which project through the boss of the wheel.

The ring 6, of the leather washer prevents any oil getting out, except that which makes its way; and that it may not drip away or run down the arms of the wheel and get to the rails, or be lost, a hollow oil box *w*, *w*, is provided to receive, and save the oil which escapes. The said box is cast in the same two pieces with the socket *f*, before described as being in two halves when they are put together; the oil box *w*,*w*, clasps around the outer end of the nave 1, of the wheel, and the circular rim of the ring 6, projects beyond the flat surface of the nave 1, against which it is fastened by the bolts as aforesaid, and the part so projecting being opposite to the flat face of one of the circular hoops (by which the nave is bound and strengthened) forms a circular groove around the circumference of the nave 1, into which groove a corresponding interior rim of the oil box projects and interclocks in the manner shewn in the section, and without touching at any part; the interlocking prevents the escape of the oil or the entrance of dust into the oil box; but all the oil which makes its way out of the hollow axis will be caught in the oil box, from whence it may be drawn off through a suitable plug hole, or tap cock, at the bottom of the oil box when a quantity has accumulated therein.

The form of the oil box is fully explained by figs. 10 and 11. The solid axis 2, is made of wrought iron, of competent strength to bear the load that the carriage is to convey.

The carriage is represented with wheels, three feet diameter, made of cast iron in one piece, and surrounded with wrought iron tires to run upon the rails; also with wrought iron hoops surrounding the projecting ends of the nave, to prevent splitting. The wrought iron tires and hoops are applied in the usual manner when hot, that they may shrink on the cast iron in cooling, and bind the same very tight; the outside of the tires are turned true, and the central holes through the naves are bored truly cylindrical. The ends of the hollow axis are turned true on the outside to fit tight into the centre holes through the wheels and when inserted they are secured by driving in a key, which is fitted into a hole previously cut in the joint, so that one half of the thickness of the key lodges in the cast iron nave, and the other half in the wrought iron hollow axis. P. The extreme ends of the hollow axis conform with the flat surface of the naves of the wheels, in order that the flat surfaces of the rings 6, with their leather washers, may apply to both.

The hollow axis is made of wrought iron, welded in the manner of gun barrels; an extra thickness is given at each end where it is to be fitted into the wheels. The inside of the hollow is bored out truly cylindrical at each end, where the bearing parts 3, of the solid axis, are to fit into it; those parts are turned truly cylindrical, and may be case hardened, as well as the interior of the hollow axis at the bearing parts, and also the projecting central parts of the rings 6.

Note.—These projecting parts enter so far into the hollow axle as to leave very small vacant spaces between them and the shoulders of the central axis, and to allow about a quarter of an inch end-play to the wheels along the solid axis.

Many of the parts hereinbefore described admit of being differently constructed, without any departure from my invention. Wheels of wood, with cast iron naves, may be substituted for those represented in the drawing. The hollow axis may be made of cast iron of a suitable increase of metal, so given to make up the same strength. The ends where the bearing parts of the solid axis are to fit into the ends of the hollow axis may be lined with brass, or with bell metal, inserted and fixed in. The ends of the solid axis may be fitted into its socket, so as to be at liberty to turn freely round therein, instead of being held fast as before described. The use of that will be, that the axle may turn round with the wheels, in case it has been neglected to give a due supply of oil to the hollow axis before setting out on a journey, and that in consequence the fitting parts thereof become bound together during a journey. A narrow groove may be cut in the cylindrical surface of each of the bearing parts of the solid axis, winding spirally round the same, in order to assist in conveying the oil to all parts of the length of the bearing.

Having now described my said invention, I do hereby declare, that what I claim as my improvement in the axles and parts which form the bearings at the centres of wheels for carriages, which are to travel upon edge railways, is the combination hereinbefore described of those parts which are marked in the drawing with numerical characters for reference in the foregoing description. That combination being made for the purpose of causing the bearings of the solid axis (which does not turn round) to press downwards into the concavities of the hollow axis, which does turn round with the wheels, and which hollow axis connects the two wheels together, so that one cannot turn round without the other; and I make no claim to the said improvement except in its application to carriages which are to travel upon edge railways.—[*Inrolled in the Inrolment Office, July,* 1831.]

To JOHN MILNE, *of Shaw, in the parish of Oldham, in the county of Lancaster, cotton spinner, for his invention of improvements on certain instruments or machine, commonly called roving frames, and slubbing frames, used for preparing cotton and wool for spinning.*—[Sealed 13th July, 1331.]

THESE improvements are stated to consist in shortening the spindles of roving and slubbing machines, in separating the flyers therefrom, and attaching a wheel to each of the flyers, for the purpose of giving them a rotary motion, by gearing distinct from, and independant of, the rotary motion of the spindle and bobbin, the particular objects of which are to produce steadiness in the movements, that is, to prevent the vibration of the spindles, and to afford greater facility to doffing or dismounting the bobbins when full of roving or slubbing.

The contrivance is simple, and is shewn in Plate IX., fig 13, which represents a portion of the front part of a roving or slubbing machine, with two of the bobbins and flyers; *a, a,* are the front drawing rollers, as usual, from which the filaments of cotton or wool pass down, through the central tubes of the flayers *b, b,* and being conducted along one of the hollow arms of the flayer, or by are lower end of the arm guided on to the bobbin *c.*

The bobbins *c, c,* are mounted on short spindles *d,* turning in bearings, and receive their rotary motion by means of bevel gear at *e, e,* from any convenient moving power, which causes them to wind the yarns on to the bobbin.

Rotary motion is given to the flyers, by means of toothed pinions *f, f,* affixed on the flyer tubes at top which pinions are driven by the intermediate, wheel *g,* actuated in any way that may be found convenient, independantly of the bobbins.

By the rotation of the flyer, the filaments of cotton or wool delivered from the drawing rollers, are spun into yarn, and there being a difference between the rotary speed of the flyers and the bobbins, the latter take up or wind on the yarns, which are thereon received in regular coils, by the ordinary movements of the copping rail *h,* which raises and depresses the bobbins, as in other similar machinery.

The ordinary parts of the machinery may be constructed in any of the usual forms or modes of combining the parts ; the features claimed as novel being, as above said the described method of shortening the spindles, to prevent vibration, and of giving to the spindles and to the flyers distinct motion, by means of separate gearing, however contrived, in a machine for roving or slubbing, which the Patentee considers to be new.—[*Inrolled in the Inrolment Office, September,* 1831.]

To Samuel Hobday, *of Birmingham, in the county of Warwick, steel snuffer and toy manufacturer, for his having found out or invented a certain improvement* *in machinery to be worked by steam, that may be applied for the moving of ships, boats, and barges, on the water, and to carriages, either on the roads or tramways, and in a fixed position, may be applied to all the purposes that steam engines are now used for.* [Sealed 24th May, 1831.]

THE nature of my said invention or improvement consists in the combination of certain parts of or to a machine or apparatus, hereinafter to be described, called a steam wheel or engine, worked by the aid or force of steam, or gas, using the known advantages of the expansive force of steam or gas in conjunction with the condensing apparatus, valves, and other parts and known principles employed in steam or gas engines or steam wheels, without claiming any of the parts individually, but only the general combination thereof, completing by this improvement a machine or apparatus capable of being employed to advantage as a first mover of power to propel machinery, which will reduce or materially lessen friction, and be more compact than the common steam engine.

Plate IX. figs. 18 to 22, represent a wheel or drum of cast iron *a*, supported by any number of arms or spokes from a spindle or shaft *b*, similar to a breast water wheel without the floats or buckets, from which spindle or shaft I propose to work either horizontally or perpendicularly, as the machinery used may require, so as to turn on its necks or centres *c*, *c*, having proper sills and supports under, according to the power of the machine. From the spindle or shaft *b*, or from the wheel or drum *a*, I propose to take the first moving power with cogged wheels or other suitable contrivance, so as to communicate the motion of the drum or wheel to any required machinery.

The outer circumference of the drum or wheel *d*, is turned true and smooth to fit steam tight to the cap or caps *f*, *f*; the inner circumference is also turned true and smooth, and two, three, four, or any suitable number of projections or jutting out pieces *e, e*, fixed thereon, so as to make the cap or caps and those parts of the outer circumference of the drum or wheel which is covered by the cap or caps steam tight, either by ground metal joints, hemp, packing, or any of the usual modes of making steam joints.

The cap or caps, which may be made of iron, brass, or any other suitable material, each covering any part not exceeding one half of the outer circumference of the wheel *d*, are properly fixed by holding down bolts, sufficient to resist the force of the steam in the chamber *g*.

The steam coming in at the top of the cap or caps, through the pipes *h*, forces round the wheel by the help of the faller or steam fulcrum *i*, which is a piece of iron of any length or width, according to the power of the machine, moving on two centres at *k, k*, and is faced with copper or any other suitable material. It describes the arc of a circle, as it is propelled upwards by the projecting or jetting out pieces *e, e*, as the wheel or drum revolves round. The facing sides and bottoms of this faller or steam's fulcrum is made steam tight, either by ground metal joints, springs, hemp, or in any of the usual modés known of making steam joints and valve facings. The faller or steam fulcrum is then pressed or forced downwards upon the circumference, by a spring or springs *l, l*.—[*Inrolled in the Inrolment Office, November,* 1831.]

To Joseph Gillott, *of Birmingham, in the county of Warwick, steel pen maker, for his invention of an improvement in the making or manufacturing of metallic pens.*—[Sealed 27th September, 1831.]

The Patentee states, that his improvement in the making or manufacturing of metallic pens, consists in forming on the nibs of metal pens, elongated points, by straight parallel pieces, instead of sloping the parts of the nibs, as in metallic pens of the ordinary construction.

He says, I make the two sides of the elongated points parallel lines (see Plate IX, figs. 16 and 17); or the metal of an equal width, from the extreme ends of the parts *a*, to the shoulder *b*, as fig. 16, by means of which an elongated point is obtained, that will preserve its original fineness of nib until it is worn down to the shoulder.

The same sort of elongated point may be made, without any shoulder at the termination of the nib part of the pen, but merging at the upper end into the nib, by a slope, as at *c*, in fig. 17.

The Patentee says, in conclusion, I hereby desire it to be understood, that I claim as my invention the making of these elongated parallel points to pens, of any width and of any length, from the shoulder or slope of the nib to the end of the point, as may be required; and also the applying of this my invention of elongated points, formed by parallel pieces, to all metallic pens, of whatever shape or construction now known or in use, without regard to their various springs, slots, or openings, in the upper parts of the said metallic pens.—[*Inrolled in the Petty Bag Office, November,* 1831.]

To Joshua Proctor Westhead, *of Manchester, manufacturer, for his having invented certain improvements in the manufacture of small wares.*—[Sealed 23d May, 1831.]

Articles usually denominated *small wares*, are of the tape kind, and narrow bindings, of cotton, linen, silk, or worsted fabric; the improvements therefore above alluded to apply to the construction and mode of working a loom for weaving those kind of goods.

" My certain improvements in the manufacture of small wares consists in the adaptation and application of certain machinery or apparatus to small ware looms of the ordinary construction, by means of which I obtain the following advantages:—The regular taking up of the tape or cloth as it is woven, a greater facility of varying the vibration of the lay, together with the saving of room required for a range of looms to stand on.

The improvements by which these advantages are obtained, and of which my invention consists, are effected in the following manner, as will be more clearly seen by reference to the figures shewn in Plate IX.

Fig. 14, represents an end view, and fig. 15, a front view of part of a small ware-loom, in which views many of the ordinary parts of the loom are omitted, and only such parts delineated as are required to shew the position in which my improvements are applied. The course of the cloth or tape in progress of manufacture is shewn by the line andarrows which point the direction in which it passes through the loom, and that part of my improvement by which the tape or cloth is regularly taken up or disposed of when woven will be seen by reference to fig. 14, where A, represents a ratchet wheel revolving freely on a fixed axis which is attached to the framing.

This wheel A, is driven in the direction of the bent arrow on its periphery by a click or dog marked *a*, supported on the stud B, on which it vibrates, and is held firmly to the wheel A, by the weight of a tail piece beneath. The stud B, is connected to the weighted lever C, which moves in a perpendicular direction on its centre *c*; D, D, represents a connecting rod attached at its upper extremity to a short arm E, projecting from the top of the lay, and at its lower extremity to the lever C, so that at every vibration of the lay the lever C, and click or dog *a*, are also vibrated in a perpendicular direction, whereby the dog or click *a*, having a gatherer or tooth in the ratchet A, forces it forward in the direction of the bent arrow already named.

On the same stud or centre which supports the ratchet A, and connected with the ratchet A, is placed a bevel wheel. This bevel wheel gears into another bevel wheel is fixed on a small shaft carrying the screw or worm H, which takes into and drives, the worm wheel I, seen at fig. 15.

In the fig. 15, it will be seen that the shaft *i, i,* on which the same wheel I, is placed, is carried along the front of the loom, and consists of a succession of fluted rollers, over which the several ends of cloth or tape pass, after leaving the breast beam of the loom. Over each of these fluted rollers is placed a pressing roller, marked *m,* which is held to the fluted rollers by means of levers and weights, so that the tapes or cloth, compressed between the fluted rollers and pressing rollers *m,* are regularly drawn forward at every vibration of the lay, by means of the movements already described.

The speed of the taking-up movement is regulated by the relative sizes of the bevel wheels, which can be changed so as to suit the exact delivery of the tape or cloth as it is woven. It must also be remarked, that when the tape or cloth has passed through the breast beam, it is carried under and over two rods, for the purpose of increasing the friction, and holding the tape firm, so that it is completely stationary while weaving, except at the period when the lay returns to strike the weft home, which is exactly the same period at which the dog or click *a,* forces forward the ratchet A, and thereby takes up the exact amount of tape or cloth, which the last strike of the beam or lay is completing.

My next improvement, by which I am enabled to save room in placing a range of looms, and to vary the traverse of the lathe with greater facility, consists in the arrangement of two circular plates, (discs) or cheeses as they are called by workmen, placed at the opposite ends of the driving shaft as seen at P, P, fig 14, and the fixing of the driving pulley on the same shaft between them, which arrangement enables me to place any required number of looms close together, I thereby save the room hitherto required for the driving pulley on the out side of the framing an advantage which cannot be gained in small ware looms hitherto constructed, either with two cranks or with a crank and cheese. The traverse of the lathe is varied, and made to correspond in the two cheeses by varying the possition of the studs marked N, best seen in figs. 14, which is not only done with great facility, but is much more readily replaced when required to be renewed than in small ware-looms hitherto constructed, in which it is well known to workmen that any repairs of the cranks, for which I substitute the two cheeses P, P, or even the making such cranks to correspond accurately at first, is attended with considerable difficulty.

Having now described my invention, I shall conclude by stating that I do not claim as of my invention any distinct or well known portion or part of such apparatus as hereinbefore described, as applied to small ware-looms for the purpose of taking up the tape or cloth when woven by means of the fluted rollers on the shaft marked *i*, *i*, in connection with the ratchet A, and other various movements, and parts receiving motion from the vibration of the lay or other convenient motion of the loom, and I further claim as of my invention the substitution of two plates or cheeses (discs) instead of two cranks or a crank and cheese, for the purpose of gaining room and facilitating any required variation in the traverse of the lay as hereinbefore described.—[*Inrolled in the Inrolment Office, November,* 1831.]

JONES *v.* PEARCE.

[In our last we gave a report of the trial, Jones *v.* Pearce, on an infringement of patent right. As the summing up of the Judge on that occasion confirmed an important point on the patent laws, and established a new view, which the courts have recently taken on the subject, we deem it expedient to give the Judge's opinion verbatim, which was delivered in the following words :—

MR. JUSTICE PATTESON, at the conclusion of his summoning up, said,

Now, Gentlemen, if on the whole of this evidence, either on the one side or the other, it appeared this wheel, constructed by

Mr. Strutts' order, in 1814, was a wheel on the same principles, and in substance the same wheel as the other for which the plaintiff has taken out his patent, and that was used openly in public so that every body might see it, and had continued to use the same thing up to the time of taking out the patent; undoubtedly then that would be a ground to say that the plaintiff's invention is not new, and if it is not new, of course his patent is bad, and he cannot recover in this action, but if, on the other hand, you are of opinion that Mr. Strutts' is an experiment, and that he found it did not answer, and ceased to use it altogether, and abandoned it as useless, and nobody else followed it up, and that the plaintiff's invention which came afterwards was his own invention, and remedied the defect, if I may so say, although he knew nothing of Mr. Strutts' wheel—he remedied the defects of Mr. Strutts' wheel, then there is no reason for saying the plaintiff's patent is not good; it depends entirely upon what is your opinion, upon the evidence with respect to that, because, supposing you are of opinion that it is a new invention of the plaintiff's, the patent is then good; then the only remaining question would be, whether the defendant has or has not infringed the patent. Now, as I have told you before, it seems the defendant has constructed a wheel whose construction is on the suspension principle,—that alone would not make it an infringement of the plaintiff's patent, because the suspension principle might be applied in various ways; but if you think it is applied in the same way as according to the plaintiff's patent is applied, then the want of two or three circumstances in the defendant's wheel, which is contained in the plaintiff's specification, would not prevent the plaintiff recovering in this action for an infringement of his patent; it would be quite a different thing if it was shewn that the defendant had had communication long before with Mr. Strutts', and had taken up Mr. Strutts' invention in Derbyshire, and had constructed something like Mr. Strutts', without any knowledge of the plaintiff's patent, and had actually borrowed it from Mr, Strutts, which was good for nothing; it would be the hardest possible thing to say that this was an infringement of the plaintiff's patent, but it merely comes to this by reason of the variance between the defendant's and the plaintiff's; it is only less useful and less desirable, but is in effect the same thing, then the two points for your consideration clearly are these—whether the plaintiff's invention is new, and if new, whether the defendant has so constructed his wheel as that that is an imitation of the plaintiff's patent; if you are of opinion for the plaintiff on both those points, your verdict will be for the plaintiff—but if you are of opinion on either of these two points against the plaintiff, then your verdict will be for the defendant; but you will be so good as to tell me upon what ground it is, whether it is upon the ground that the plaintiff's invention is not new, or upon the ground that the defendant's is not an infringement, because it may make a material difference hereafter, because you generally find these cases do not rest with the Judge and Jury, but it remains for another Court to see whether the decision which has been come to is right or not, therefore you had better be very specific. The Damages I think are a matter of no consequence.

The Jury consulted together for a few minutes.

The Foreman of the Jury.—My Lord, is it in evidence at all that the defendant had either used or sold the wheels?

Mr. Justice Patteson.—As far as regards that, the evidence is, that the witness Drake saw them; he says that the defendant is an ironmonger, that he saw the two wheels at his place, and that the defendant told witness he had made them on a new principle, (the witness was sent to see them); he said he was going to try them in a few days, and he said if I would leave my address he would know where to send to me; he is not certain whether he said he had been in London or not.

The Foreman.—Is it necessary, my Lord, that he should have sold or used them?

Mr. Justice Patteson.—Not that he sold them; if he made them, it is not necessary that he should have sold them; if he made them that is sufficient.

A Juryman.—If he made them from mere experiment would that be sufficient?

Mr. Justice Patteson.—I think the witness said that they were on the gig.

Mr. Rotch.—One of them, one was on the gig.

Mr. Justice Patteson.—One was on the gig and the other was lying against a bench, and he said he was going to try them, and if I would leave my address he would let me know. Now whether you can collect from that, he being an ironmonger, that he made them for the purpose of sale, I think if you look at his letter that will put the matter quite clear.

Mr. ————.—Will your Lordship allow me to draw your attention to the terms of the patent, which is "for making" as well as "selling?"

Mr. Justice Patteson.—One of the counts of the declaration is for making as well as selling. If he had made a model for an experiment, it would be another thing, but I think the terms of this letter will put that beyond doubt. (Mr. Justice Patteson here looked at the letter). I do not see there is anything in this letter which throws any light upon it: the one wheel that was seen was seen upon the gig by the witness, and the other by the side of it. I see the terms of the patent are "without leave or license make," &c. &c. Now if he did actually make these wheels, his making them would be a sufficient infringement of the patent, unless he merely made them for his own amusement, or as a model, that could not be.

The Jury after consulting together for a few minutes, returned a verdict for the plaintiff on both points.

Mr. ————.—Will your Lordship be pleased to certify for a Special Jury in this case?

Mr. Justice Patteson.—Certainly.

SOCIETY OF ARTS, ADELPHI, LONDON.

The Society have adjudged Rewards for the following Subjects received and approved during their Session, 1831-1832.

IN THE CLASSES OF MECHANICS, CHEMISTRY, AND COLONIES AND TRADE.

To J. Wilson, Green, Esq., Newton Abbot, Devon, for his floors and frames for large ships, the gold Isis Medal.

To Mr. T. Medlen, Gill-street, Limehouse, for his improved ship's capstan, the large silver medal.

To Mr. W. Kennish, for his method of concentrating a ship's broadside, the gold Isis Medal.

To Mr. Andrew Smith, Princes-street, Leicester-square, for his improved cramp for flooring boards, the large silver Medal.

To Mr. J. Hall, Jun., for his improved sashes for Gothic windows, the silver Isis Medal.

To Mr. C. Taperell, Penton-place, Pentonville, for an improved spindle for mortice locks, the silver Isis Medal and 5*l*.

To Mr. W. H. Perkins, Hoddesdon, Herts, for an improved cawl for ventilating stables, the silver Isis Medal.

To Mr. W. T. Penny, Castle-alley, Whitechapel, for a cutting plough for stationers, 5*l*.

To Mr. T. Lane, Stockwell, for his instrument for describing spirals, the large silver Medal and 15*l*.

To Mr. M. H. Shuttleworth, Chapel-place, Poultry, for his machine for drawing lines towards an inaccessible point, the large silver Medal.

To Mr. H. Slack, Berner's-street, Oxford-street, for his dissecting microscope, the silver Isis Medal.

To Mr. Edm. Turrell, Clarendon-street, Somers-town, for his improved stage for a microscope, the silver Isis Medal.

To Mr. J. Holland, Manor-place, Walworth, for his triplet for microscopes, the large silver Medal.

To Mr. Corn. Varley, Charles-street, Somers-town, for his lathe for grinding and polishing large lenses and specula, the large silver Medal.

To Mr. Geo. Hennekey, Holborn, for his gauge for standing casks, the silver Isis Medal.

To Mr. J. Hemming, Brecknock-crescent, Camden-town, for his safe tube for explosive gasses, the large silver Medal.

To Alex. Riley, Esq., for importing a flock of Cashmeer-Angora goats, the gold Isis Medal.

To N. Wallich, M.D. F.R.S. Superintendent of the Botanic Garden of Calcutta, for specimens of Indian woods collected and described by him, the gold Ceres Medal.

IN THE CLASS OF POLITE ARTS.

AMATEURS.—FOR COPIES.

To Mr. R. W. Roberts, Mercer-street Long-acre, for a copy in pen and ink of a head, the silver Palette.

To Mr. L. H. Shepheard, Guilford-street, Russel-square, for a copy in pencil of a landscape, the silver Isis Medal.

To Mr. Aug. Staunton, Craven-street, Strand, for a copy in pencil of animals, the silver Palette.

To Mr. H. J. Vully, Angel-lane, Hammersmith, for a copy in chalk of an historical subject, the silver Isis Medal.

To Miss Harris, Lambs-conduit-street, for a copy in Indian ink of a head, the silver Isis Medal.

To Miss Eliz. Langmore, King-street Finsbury-square, for a copy in chalk of a head, the silver Isis Medal

To Miss H Warlters, Bloomsbury-square, for a copy in chalk of ahead, the silver Palette.

To Miss Fisher, Holly-terrace, Highgate, for a copy in water celours of a print, the large silver Medal.

To Miss R. F. Tyreman, Euston-square, for a copy in water colours of a portrait, the silver Palette,

To Miss M. Stace Lawson, Turnham-green, for a copy in miniature of a portrait, the large silver Medal.

To Miss Eliz. Jane Orger, Tooting, for a copy in pencil of a landscape, the silver Isis Medal.

To Miss Leppingwell, Croydon, for a copy in pencil of a landscape, the silver Palette.

To Miss E. Manning, Newman-street, for a model of a bust from the antique, the large silver Medal.

For Originals.

To Mr. H. Browne, Sidmouth-street, Gray's Inn Road, for a group of figures in pencil, the silver Isis Medal.

To Mr. R. S. E. Gallon, Royal Hospital, Greenwich, for an historical composition of figures in oil, the gold Isis Medal.

To Mr. Jos. Tanner, Little Russell-street, Covent Garden, for a portrait in oil, the silver Isis Medal.

To Mr. J E. Nichols, Shrubbery House, Putney, for a drawing of a Landscape, the silver Isis Medal.

To Mr. Douglas Morrison, Datchet, near Windsor, for a drawing of a landscape, the silver Palette.

To Mr. J. Absolon, Jun. Bridge Road, Lambeth, for a portrait in chalk, the silver Palette.

To Miss Sharpe, Chiswick Mall, for a finished drawing from a figure, the silver Isis Medal.

To Miss L. J. Holder, Dartmouth-street, Westminster, for a portrait in water colours, the large silver Medal.

To Miss F. Crockford, Sussex Place, Regent's Park, for a landscape in water colours, the large silver Medal.

To Miss Wiggins, Gloucester-place, Portman-square for a painting in oil of a landscape, the large silver Medal.

To Mrs. J. Docker, Terrace, Putney, for a painting in water colours of flowers, the silver Isis Medal.

To Miss Eliz. Larkin, Alfred-place, Bedford-square, for a composition in water colours of flowers, the silver Palette.

To Miss L. S. Welby, Great Russell-street, Bloomsbury, for a composition in water colours of vegetables, the large silver Medal.

To Miss M. A. Plant, Friday-street, Cheapside, for a composition of flowers in water-colours, the silver Isis Medal.

To Miss A. E. Cole, Alpha-Road, Regent's-Park, for a lithographic drawing, the large silver Medal.

Students in Architecture.

To Mr. James Wilson, Lower Seymour-street, Portman-square, for a drawing in perspective from a Corinthian capital, the large silver Medal.

To Mr. Geo. Mair, for an original design for an ornamental lodge, the large silver Medal.

To Mr. J. Douglas Hopkins, Cleveland street, Fitzroy-square, for an original design for an ornamental lodge, the gold Isis Medal.

New Patents

GRANTED IN ENGLAND IN 1832.

To Edward Garsed, of Homerton, in the parish of Saint John, Hackney, in the county of Middlesex, gentleman, and Alfred Robinson, of Mile End, in the parish of Saint Dunstan, Stepney, in the said county, merchant, for their having in vented or found out certain improvements in apparatus for heating, warming, and ventilating drying houses, rooms, buildings, ships, and mines — 22d June, 6 months.

To Frederick William Isaac, of Charlotte-street, Fitzroy-square, in the county of Middlesex, ivory, tortoise shell, and pearl worker, for his having invented certain improvements in ornamenting the finger keys and other parts of piano fortes, organ, and other musical instruments.—28th June, 6 months.

To James Macdonald, of the University Club-house, Pall Mall East, in the county of Middlesex, gentleman, that in consequence of a communication made to him by a certain foreigner residing abroad, he is in possession of an invention of an improved construction of railways.—29th June, 6 months.

To Alexander Beattie Shankland, of Liverpool-street, in the city of London, Esq. that he has lately had communicated to him by a foreigner residing abroad, a new method of spinning wool,—5th July, 2 months.

To William Daubney Holmes, of St. John-square, in the county of Middlesex, engineer, for his having invented or fouud out a new method of heating houses and other buildings, and of applying heat to various manufactures and other purposes.—19th July, 6 months.

To Thomas and Robert Wedlake, of Hornchurch, in the county of Essex, agricultural instrument makers, for their having invented certain improvements in ploughs, particularly the shares applicable to the same and other ploughs.—19th July, 2 months.

To Robert Hicks, of Wimpole-street, in the county of Middlesex, Esq., for his having invented an improved method of an apparatus for baking bread.—19th July, 6 months.

To William Hodge of Margaret-place, Dover-road, in the county of Surrey, hat dyer, for his having invented certain improvements in apparatus for dyeing hats.—19th July, 6 months.

To Joshua Wordsworth, of Leeds, in the county of York, machine maker, for certain improvements in machinery for preparing, drawing, roving, and spinning flax, hemp, wool, and other fibrous materials.—26th July, 6 months.

To Miles Berry, of Chancery-lane, in the parish of St. Andrew, Holborn, in the county of Middlesex, civil engineer and mechanical draftsman, in consequence of a communication made to him by a certain foreigner residing abroad, for certain improvements in the construction of presses applicable to various purposes.—26th July, 6 months.

CELESTIAL PHENOMENA, FOR AUGUST, 1832.

D.	H.	M.	
1	0	0	Clock before the ☉ 5 m. 59 s.
1	0	0	☉ rises 4h. 19. sets 7 h. 41 m.
1	9	13	♃ rises.
1	10	35	♂ rises.
3	10	49	☽ in □ or first quarter.
3	13	14	♃'s second satellite will immerge.
4	0	0	Vesta R. A. 11 h. 9 m. dec. 10. 56. N.
4	0	0	Juno R. A. 11 h. 35 m dec. 5. 28. N.
4	0	0	Pallas R. A. 0 h. 9 m. dec. 4. 27. N.
4	0	0	Ceres R. A. 2 h. 50 m. dec. 6. 1. N.
5	0	0	Clock before ○ 5 m. 40 s.
5	0	0	☉ rises 4 h. 21 m. sets 7 h. 36 m.
6	8	21	☽ passes the meridian
6	10	40	Jupiter's third satellite will immerge.
6	12	50	Jupiter's first sat. will immerge.
7	0	14	♀ passes the meridian.
7	14	43	♃ passes the meridian.
8	16	0	☽ in Apogee.
9	10	46	☽ passes the meridian.
10	0	0	Clock before the ☉ 5 m. 3 s.
10	0	0	☉ rises 4 h. 34 m. sets 7 h. 26 m.
10	15	50	Jupiter's second sat. will immerge.
11	2	28	Ecliptic opposition or ○ full moon.
13	14	42	Jupiter's third sat. will immerge.
14	6	28	☽ in conj. with Jupiter long. 27. in Pisces, ☽ lat. 4. 14. S. Jupiter lat. 1 30 S. diff. of lat. 2. 44.
15	0	0	Clock before the ☉ 4 m. 11 sec.
15	0	0	☉ rises 4 h. 43 m. sets 7 h. 17. m.
15	2	25	☽ passes the meridian.
15	9	14	Jupiter's first sat. will immerge.
15	13	41	Jupiter's fourth sat. will immerge.
16	1	38	☿ passes the meridian.
18	7	7	☽ in conj. with ♂ long. 18. in Taurus, ☽ lat. 5. 3. S. ♂ lat. 2. 5. S. diff. of lat. 2. 58.
19	6	33	☾ in □ or last quarter.
20	0	0	Clock before the ☉ 3 m. 6 sec.
20	0	0	☉ rises 4 h. 52 min. sets 7 h. 8 min.
20	6	39	☽ passes the meridian.
21	10	26	Jupiter's second sat. will immerge.
22	1	27	☿ passes the meridian.
22	13	22	Jupiter's first sat. will immerge
22	16	51	☉ enters Virgo.
24	0	0	Vesta R. A. 11 h. 45 m. dec. 7. 4. N.
24	0	0	Juno R. A. 12 h. 2 m. dec. 3. 8 N.
24	0	0	Pallas R. A 0 hr 3 m. dec. 1. 12. N.
24	0	0	Ceres R. A. 3 h. 0 m. dec. 6. 18. N.
24	0	0	☽ in Perigee.
24	7	50	Jupiter's first sat. will immerge
24	10	40	☽ passes the meridian.
25	0	0	Clock before the ☉ 1 m 50 s.
25	0	0	☉ rises 5 h. 2 m. sets 6 h. 58 m.
25	9	44	Ecliptic conj. ● or new moon.
26	0	13	☽ in conj. with ♀ long. 11. in Virgo, ☽ lat. 3. 14. S. ♀ lat. 1. 25. N. diff. of lat. 4. 39.
26	22	8	☽ in conj with ☿ long. 25. in Virgo. ☽ lat. 4. 9. N. ☿ lat. 4 1. S. diff of lat. 8. 10.
26	0	0	☿ stationary.
27	1	31	☽ passes the meridian.
28	13	1	Jupiter's second sat will immerge
29	15	17	Jupiter's first sat. will immerge.
30	0	0	Clock before the ☉ 24 sec.
30	19	0	♀ in conj. with ♄ diff. of dec. 32.
30	0	0	○ rises 5 h. 11 m. sets. 6 h. 49 m.
30	3	58	☽ passes the meridian.

J. LEWTHWAITE, Rotherhithe.

A remarkable high tide may be expected about the 27th or 28th of this month, upon the southern coast of our island. It will be high water at London Bridge on the 27th at 36 minutes past 3 in the afternoon, and on the 28th at 9 minutes past 4 o'clock.

METEROLOGICAL JOURNAL,

For June and July, 1832.

1832.	Thermo. Hig.	Thermo. Low	Barometer. Hig.	Barometer. Low	Rain in inches.	1832.	Thermo Hig.	Thermo Low	Barometer. Hig.	Barometer. Low.	Rain in inches
June 26	71	43	30,09	30,03		July 11	77	55	29,71	29,68	,05
27	74	45	30,22	30,14		12	75	53	29,85	29,83	
28	77	43	30,31	30,29		13	75	53	29,74	29,72	,375
29	77	51	30,35	Stat.		14	69	54	29,99	29,95	,475
30	74	53	30,32	30,29		15	73	46	30,29	30,20	,1
July 1	77	41	30,27	30,23		16	73	51	30,22	30,14	
2	76	41	30,14	Stat.		17	82	54	30,11	30,04	
3	71	41	30,10	30,04		18	69	50	30,04	30,00	
4	79	46	29,98	29,94		19	68	45	30,11	30,06	
5	74	52	29,95	Stat.		20	65	40	30,16	30,13	
6	72	51	29,89	29,76		21	63	42	30,20	30,18	
7	71	45	29,84	29,73		22	62	40	30,14	34,13	
8	71	40	29,86	29,81		23	63	38	30,13	Stat.	
9	73	50	29,83	Stat.		24	67	48	30,15	30,11	
10	73	55	29,87	29,84		25	69	49	30,15	30,11	

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CHARLES HENRY ADAMS.

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PATENT INVENTIONS.

No. VI.

(CONJOINED SERIES.)

Recent Patents.

To Edward Newman Fourdrinier, *of Henley, in the parish of Stoke-upon-Trent, in the county of Stafford, paper-maker, for his having invented a certain machine for an improved mode of cutting paper.*—[Sealed 6th June, 1831.]

The invention which forms the subject of this Patent, applies to that kind of machinery by which paper is made in a perpetual length. The inconvenience and difficulty of cutting the paper so made, into small sheets by hand, has caused many contrivances to be proposed for that purpose;—for instance, the invention for which a Patent was granted to Edward Cowper, March, 1828, (see the

Eighth Vol. of our Second Series, page 20.) The present Patent is for a mechanism to perform this operation with expedition and precision; and is described in the following words:—

My invention consists in a combination or arrangement of apparatus or machinery, and thus producing a machine, by which an improved mode of conveying lengths of paper from the reel, to receive the transverse cut is obtained; and at the same time the machine is capable, by a simple adjustment, to cut the lengths of paper into the required sizes.

Paper making machines are generally constructed to make the lengths of paper of a sufficient width, so that when severed by longitudinal cuts, they will each form one, two, or more lengths of paper, ready to be divided by transverse cuts into sheets. My invention is a machine for conducting such lengths of paper, either single or if more than one, placed one upon the other to receive the transverse cut as hereafter fully described; and I prefer the longitudinal cuts to be made prior to the reels which carry the lengths of paper being put into the machine.

Plate XII, represents my machine in different views; fig. 1, is an elevation, taken on one side of the machine; and fig. 2, is a longitudinal section of the same, the several letters referring to similar parts in these two figures; *a, a, a, a,* are four reels, each having one length of paper wound round; they are respectively supported on bearings in the frame work *b, b, b*; *c, c, c,* is an endless web of cloth, felting, or other suitable fabric, passed over rollers *d, d, d, d,* which web is kept in close contact with the under side of the drum *e, e.*

The lengths of paper to be operated upon, are passed between the drum *e,* and the endless web *c,* as shewn in the figures; and on motion being given to the machine by a band or strap, or by geering, communicating from any first mover to a rigger fixed on the driving shaft *f*, the paper will be drawn off the reels, and fed into the machine.

But, as it is necessary that the progress of the paper forward should be stopped, during the time that the transverse cut takes place, that stopping is effected by the following means:—

On the shaft *f*, is fixed the crank plate *g*, (see fig. 1,) which carries the pin or stud of the crank. This pin is set in an adjustable sliding piece *i*, which may be fixed by a screw in the graduated groove, upon the face of the plate *g*, and thereby, the throw of the crank made greater or less as may be required. The crank pin is connected by its rod *j*, to the oscillating segment rack *k*, (suspended from its fulcrum above), which takes into the toothed wheel *l*, turning loosely upon the axle of the drum *e, e*; upon this toothed wheel *l*, the arms *m, m*, are mounted, carrying one or more palls *n*, which take into the teeth of the ratchet or toothed wheel *o, o*, fixed upon the axle of the drum.

As the crank and its plate *g*, revolve in the direction of the arrows, the segment rack *k*, will be made to oscillate, in doing which, it will give a reciprocating rotary motion to the toothed wheel *l*, and that will cause the arms *m,m*, carrying the pall *n*, to vibrate. The pall in receding, slides over the periphery of the ratchet wheel, but in advancing as the arrow points, it takes into the teeth of the ratchet, and drives it and the drum round part of a revolution, and the friction of the drum and the endless web, by these means, draws from off the reels into the machine at intervals, such lengths of paper as may be required to be cut off into single sheets; the knife being intended to cut through the paper transversely at the time that the segment rack is receding, that is, where the paper is not advancing.

It may here be stated, that according as the crank pin in the sliding piece *i*, is fixed nearer to, or further from the centre of the shaft *f*, the distance through which the crank passes in revolving, will be increased or diminished; and the drum *e*, will, by that means, be made to perform more or less of a revolution at each movement, and consequently draw into the machine greater or less lengths of the paper ; this adjustment is for the purpose of enabling the machine to cut the paper into sheets of different sizes.

The lengths of paper having by these means been carried forward over the bed *r*, of the cutting knife, (which has a fixed blade, seen best in the section fig. 2), the wiper or lifter *s*, on the rotary shaft *f*, will raise the tail of the lever *t*, which causing the other end with the knife *u*, *u*, fixed transversely upon it to be depressed (as shewn in the detached fig. 4), the two edges act as shears, and cut through the paper crosswise.

But, before the knife *u*, begins to operate, the transverse fall board *v*, will be allowed to descend by its own gravity, and its edge to press and hold the paper upon the bed *r*, during the time the knife is cutting, this fall board *v*, is suspended by cords or straps passing over pulleys from the arm *y*, fixed to the lever.

As soon as the lifter has passed away from the tail of the lever *t*, the weight *z*, suspended from it will cause the knife and the fall board to be drawn up out of the way of the advancing length of paper, which will be brought forward immediately by the movement of the drum *e*, as before described.

The knife or cutter is not placed parallel to it axis, but at an angle thereto, and is curved, to bring the edges against that of the fixed blade.

The knife or cutter need not be fixed upon the ends of levers, but may be placed between two guide pieces, and have the necessary motion given to it by levers, or otherwise, as will be hereinafter described.

Fig. 3, shows a slight variation in the fixing of the rod *j*, which is connected directly to the rack *k*, and in this figure I have only represented one reel placed in the machine, in order to show that the machine is capable of receiving one or more reels; and I have also represented this figure to show that the knife *u*, may be guided between two pieces, instead of its being placed at an angle to its axis as before described; but in every other particular the machine is the same, and the corresponding letters of reference indicate similar parts.

Although I have in this my specification, described parts which are not new, and may have been before used in paper cutting machines, I wish it to be understood, that I do not claim such parts as of my invention; but I do claim the particular mode of drawing, leading, or feeding into the machine the length or lengths of paper to be operated upon, by means of the crank and its connecting rod, the oscillating segment rack and its toothed wheel and palls, with the ratchet or toothed wheel drum, and endless web as herein described; and also the manner or mode of adjusting the length of the crank, and consequently the length of the sheet of paper intended to be cut off, by the peculiar construction of the crank plate, guides, adjustable pin or stud, and slider, as also hereinbefore particularly explained; and, lastly, the general arrangement, combination and construction of the parts, or the mechanism forming "a machine for an improved mode of cutting paper."—[*Inrolled in the Rolls Chapel Office, December*, 1831.]

* Specification drawn by Messrs. Newton & Berry.

To GEORGE SOLOMANS *and* ELIAS SOLOMANS, *of Bedford-square, in the parish of Stepney, and county of Middlesex, opticians, in consequence of a communication made to them by a certain foreigner residing abroad, for an invention of improvements in preparing certain transparent substances for spectacles, and other purposes.*—[Sealed 16th February, 1832.]

THE whole matter of this invention may be told in one word—the construction of lenses of *amber* instead of glass.

The amber is to be carefully selected, and those pieces taken, which appear to be most transparent and free from specks; they are then to be cut into such dimensions and forms as may be best suited to the lenses intended to be made, and after having been reduced by filing nearly to the proposed figure, each lens is to be ground in the same way and with the same sort of apparatus that glass lenses are prepared by the ordinary process; and in polishing these lenses, putty powder is to be employed with spirits of wine.

The Patentees have not mentioned any advantages which spectacles possess made with amber lenses; we are therefore unable to point out the merits, if any, of this invention.—[*Inrolled in the Inrolment Office, August,* 1832.]

To GEORGE VAUGHAN PALMER, *of the parish of St. Swithin's, Worcester, artist, for certain improvements in machinery, or apparatus for excavating, and which is called an excavating and self-loading cart.*—[Sealed 24th January, 1832.]

THE Patentee states in his specification of the above invention, that his excavating and self-loading cart may be worked by horse or other power, and that he excavates by ploughing instruments connected to the body of the cart or carriage under command of cranks and levers which loads itself by means of its own wheels, and receive and convey the soil into its own body, being expressly adapted to answer the double purpose of travelling on roads as other cart or carriage wheels, and as earth lifters. The general construction of this cart or carriage bears a close resemblance to others. The tire of the wheel has a smooth surface on the exterior to travel on roads, but the interior part differs from all others in its construction being hollow, and adapted to receive and lift earth or soil, and has a fence or flange on each side, subdivided by compartments or partitions acting as earth lifters, the earth being received from an excavating instrument connected to the cart or carriage body on the interior part of the wheel's tire between the partitions or earth lifters, and in the wheel's progress in travelling on the surface of the earth, the earth lifter conveys it upwards over the wheel's centre, and as each partition in succession becomes inverted, delivers the earth or soil into the body of the cart.

This cart also differs from others in the application of an excavating instrument connected to it for the purpose of excavating and supplying the wheel or lifters with earth, it being adapted to receive earth or soil as it travels on the earth's surface.

In Plate XII, fig. 5, is a sort of perspective or side view of one of these self-loading carts. Fig 6, is a plan view of the same ; and fig. 7, is a view of the back ; *a,a*, is the line of the wheel, with a flange on each of its sides; *c*, is the excavator. The wheel next the excavator is not so broad as the opposite one, in order that the earth or soil may more easily pass over it, to supply the wheel with earth, which is turned into it by the excavator; *d, d*, are partitions or earth lifters, which subdivide the tire of the wheel, are made fast to it, and to each flange *b*, and project from the interior part of the tire towards the centre of the wheel. The number of these partitions required, depends on the size of the wheel, and the work it has to perform. The excavating instrument *c*, in its exterior form bears a close resemblance to a plough, and may be made to act on either side, or behind the wheels. If it be adapted to act behind the wheel, an open space must be made to admit the earth to pass under the wheel. Figs. 5, and 6, represent the excavating instrument placed so as to act on the outside of each wheel; *e*, is the body of the cart; *f*, the shafts; *g, g*, the projecting side of the cart body, over which the tire and flanges of the wheel project.

The tire, flanges, and partitions, of the wheels may be cast in iron altogether, but it can be made in wrought iron by riveting and screwing the various parts together.

The excavator is made fast to a beam *h*, by bolts; *i*, is a lever connected to the shaft *j*; at the head of the cart *k, k*, are cranks upon the end of the shaft *j*, connected to the beam *h*,; on the lever *i*, being raised or lowered, the excavators will be put into, or out of action.

The bottom of the cart is formed by two flaps or folding doors, for the purpose of more easily unloading the cart; *l, l*, are projecting pieces made fast to the body of the cart; *m, m*, the folding doors, which when closed, form the bottom of the cart *n*, is the axletree; *o*, chains connected to the folding doors and to the rod *p*, on which the chains *o*, are wound and unwound by a winch handle *q*, attached to the rod *p*, and *r*, is a ratchet wheel attached to the rod *p*, by which the doors are kept closed.

Fig. 7, shews the wheel with the tire removed; *d*, the earth lifters, or partitions; *b*, *b*, its two flanges; fig. 8, is a section of the wheel, shewing the appearance of the partitions or earth lifters; *s*, *s* the spokes; *t*, the nave; fig. 9, represents the cart in positions to begin working by horse power. The lever *i*, being down, on the cart being pulled forward, the excavators pierce the earth without any assistance from the driver, and on excavating and turning the earth into the recesses of the wheel, the partitions or earth lifters convey it upwards, and delivers it above the wheel's centre into the cart or carriage body. Each partition or earth lifter in succession becomes inverted until the cart is loaded, when the excavator can be lifted above the earth's surface by means of the lever *i*, and thereby put out of action; the cart can then travel on any road to its place of delivery as any other cart; *a*, is a chain which is made fast at one end to the excavator *c*; the other end is attached to the head of the cart at *v*. By shortening or lengthening the chain between the excavator and the head of the cart, the excavator can be adjusted to the depth of earth, soil, &c. required to be removed, the crank *k*, being stopped when descending on any part of its circle in proportion to the length of the chain.

The cart is unloaded from the bottom, it being formed of two folding doors *m*, *m*, as before stated, which are opened and closed by a chain *o*, wound and unwound round the rod *p*, by turning the winch handle *q*. When the doors are closed, they may be made fast by placing the stopper *w*, between the teeth of the ratchet wheel *r*. Some kind of work to be performed by this cart may require a third wheel to be placed in front of it, or a wheel before each excavator attached to the beam *h*, which may be omitted or added as they are required for the purpose, so as to take a part of the weight off the horse's back

The Patentee states, in conclusion, that his "invention or improvements in carts or carriages consist in the new application of a cart or carriage wheel to receive and lift earth or soil, and convey it into its own carriage body whilst travelling on the earth's surface, and in adapting an excavating instrument to a cart or carriage to supply its wheel with earth, which wheel delivers the earth into its own carriage body."—[*Inrolled in the Inrolment Office, July,* 1832.]

To ELIJAH GALLOWAY, *of Carter-street, Walworth, in the county of Surrey, engineer, for certain improvements in paddle wheels.*—[Sealed 17th May, 1832.]

THE Patentee states in his specification, that his invention consists in constructing paddle wheels on two axes or shafts, they being set at an angle to each other, whereby the float boards or paddles, which are set at an angle to to their respective axes, are made to approach each other as they enter the water, and come into action for propelling, and at the same time those paddles or float boards, which are going out of action recede from each other, and permit the water to pass between them, the paddles leaving the water edgewise.

Plate XII, fig. 10, is an edge view of two paddle wheels, placed on two axes set at an angle to each other, and fig. 11, shews the universal joint separately, which connects the shafts or axes of the paddle wheels; *a*, and *b*, are the two paddle wheels. The axes or shafts *c*, of the wheel *a*, turns in bearings affixed on the beam, running from end to end of the paddle box, and the shaft of axes *d*, of the wheel *b*, turns in bearings affixed to the beam *f*, *f*, also running from end to end of the paddle box.

The Patentee has not thought it necessary to shew in the drawings, any part of the vessel to which these paddle wheels are to be affixed, there being no variation from those already in use excepting the additional beams *f*, *f*, which carry the second wheel *b*. The main shaft *c*, which carries the wheel *a*, is that which receives motion from the engine or first mover, and such motion is communicated to the axes or shaft *d*, by means of the universal joint which connects the shaft *c*, and *d*, and thus are the wheels *a*, and *b*, caused to turn in the same direction, and there being the same number of paddles or float boards on each of the paddle wheels, and their edges being opposite each other, when at the lowest point of the circle, the revolution of the wheel causes the corresponding edges of the paddles or float boards on the wheels *a*, and *b*, to approach each other as they enter the water, and form two sides of a triangle, which hold the whole or greater portion of the water during the time they are in a condition to give a beneficial propelling action; but when they would tend to lift the water (commonly called the "back water") the float boards recede from each other, and permit the water to pass between them, and they of course at the same time leave the water in a feathered or edgewise position, by being so fixed on the arms of the wheel.

The paddle wheels *a*, and *b*, are strongly affixed to their respective shafts, in a similar manner to those already in use in steam boats; and the construction of the paddle wheels varies only from those most generally used, inasmuch as the paddles or float boards are set at an angle to their respective axes or shafts; and the angle which the Patentee prefers for setting the paddles or float boards, and also the angle for setting the shafts or axes *c*, and *d*, will be seen in the figure, although he does not confine himself to those angles, as the same may be varied without departing from this invention.

Fig. 11, shews the universal joint separately, by which its action will be readily understood, and consequently the means of producing rotary motion to the shaft *d*, from the shaft *c*, and a simultaneous action to the paddle wheels *a*, and *b*. The connection or universal joint consists of the arms or cross *i*, *i*, which are keyed to the end of the axes or shaft, which carries the wheel *b*, and by means of the connecting pieces or links *j*, *j*, which are connected, (but allowed to turn) to the shaft *c*, by the pins *k*, *k*, which pass through the connecting piece *j*, *j*, at *k*, *k*, and the connected pieces *j*, *j*, are connected to the arms *i*, *i*, by the upper part of that arm passing through the pieces *j*, *j*, at *l*, *l*, as shewn in the figure. By this means whatever motion is communicated to the axes or shafts *c*, will at the same time be communicated to the shaft or axes *d*, and the two wheels will revolve in the same direction, and the edges of the corresponding float boards or paddles on the two wheels, will be brought to approach each other as they enter the water, and recede from each other as they leave the water, as above described, and thus each pair of corresponding float boards when they are brought edge to edge, act as one float board, and hold the water to produce the propelling action; and afterwards as they go out of action, by receding from each other permit the water to pass between them, and come out edgewise, thus producing a feathering action as above described.

The Patentee observes, in conclusion, that he is aware that paddle wheels having the float boards, or paddles curved and set at an angle to the axis or shaft, have been before used, he does not therefore lay any claim as a novel invention in usuing such paddle wheels, but states that his invention consists in applying two such paddle wheels on two axes or shafts set at an angle to each other, whereby the edges of the float boards or paddles are made to approach each other in coming into action for propelling, and are caused to recede from each other as they go out of action, for the purpose of permitting the water to pass between them as above described.—[*Inrolled in the Inrolment Office, Jan.* 1832.]

To RICHARD ATKINSON, *of Huddersfield, in the county of York, woollen cloth manufacturer, for his invention of an improved machine or method for raising or brushing woollen cloths and other goods.*—[Sealed Feb. 16th, 1832.]

IN this improved machine for raising or brushing woollen cloths (which is of the class of machinery called a gig mill, on the ordinary Yorkshire construction) the teasle boards or frames, or boards of cards, or of brushes, are attached to the gig barrel by a peculiar mode or method of fastening, which enables the Patentee to introduce springs between the teasle frames, or boards of cards, or brushes and the working barrel, and thereby to allow a degree of elasticity to their operation when acting upon the surface of the cloth in raising the pile or brushing the nap. And this machine when so improved, affords the means of dressing woollen cloths and other goods by a much more effective method (viz. by an elastic raiser or brush) than can be obtained by any of the gig mills or dressing machines in which the teasles, cards, or brushes are firmly fixed to the revolving barrel.

In plate XIII, fig. 1, exhibits a front elevation, and fig. 2, a section taken transversely of a gig mill with these improvements adapted thereto, but in which several of the teasle boards, card boards, or brushes are removed for the purpose of shewing the springs that are to act beneath them. Fig. 3, represents one of the boards attached to the barrel upon an enlarged scale; the same letters referring to the corresponding parts in all the figures; *a, a, a,* is the ordinary barrel or cylinder of the gig *b, b, b,* thin pieces of steel or other fit material which are affixed by screws or other means to the barrel, and are bent upwards to constitute springs that shall support the teasle boards, card boards, or brushes when mounted on the barrel; *c, c,* are pillars or pins of iron set into the barrel near each end, standing radially, and fastened by screw-nuts at the under part, or secured by any other suitable means; *d,* is the teasle board, card board, or brush, which is mounted on the barrel by passing the pins or pillars *c, c,* through the holes near the ends of the board, such holes being lined with brass or brass bushes, and the boards are secured to the pillar by screwed nuts *e, e.*

The pillars are made something smaller than the holes in the ends of the board, and thereby the board is enabled to move up and down readily, but being supported on the under side by the springs *b, b,* it is held up close to the nuts, as shown at fig. 3, unless pressed upon by any force on the upper side. As the general construction of a gig mill and the manner in which the teasles, cards, or brushes act upon the face of the cloth in raising or dressing the pile is so well understood, it is scarcely necessary to say that the cloth as it passes through the machine pressess by its tension with considerable force against the teasles, cards, or brushes placed round the barrel, and by the rigidity of action the cloth frequently becomes injured. It will however be perceived, that in this improved machine the boards which carry the teasles, cards, or brushes being raised up some distance from the periphery of the barrel, and supported on springs, that pressure which is caused by the tension of the cloth as the gig barrel goes round, is relieved by the elasticity of the bearings on which the boards are mounted, and that any injury which the cloth might be liable to receive is thereby prevented. And further, that by this method of dressing the cloth by elastic boards of teasles, cards, or brushes, a more perfect raising of the pile is effected, and a much softer nap produced. In conclusion, the Patentee wishes it to be understood that although he has represented as in the figures springs for supporting the boards bent into a particular form, and placed in a particular way upon the barrel of the gig, yet he does not intend to confine himself precisely thereto, as helical springs placed round the pillars under the ends of the boards, or springs of various forms placed between the barrel and the teasle boards, might answer the purpose equally well; he therefore declares that his invention consists in the introduction of springs under the boards or frames of teasles, cards, or brushes, attached to a gig machine for raising and dressing woollen cloths and other goods, and he does not intend to confine himself to any particular form or construction of dressing machines to which the same may be adapted, as the contrivance is equally applicable, both to the first process of raising the pile of the cloth by teasles or cards, and to the last process of dressing or laying the nap by rotary brushes.—[*Inrolled at the Rolls Chapel Office, August*, 1832.]

Specification drawn by Messrs. Newton and Berry.

To SAMUEL WALKER, *of Millshaw, near Leeds, in the county of York, clothier, for his invention of certain improvements in gig machines for dressing woollen cloths.*—[Sealed March 1st, 1832.]

THESE improvements in gig machines for dressing woollen cloths consist in the novel arrangement of the rollers and the parts connected thereto, that carry and conduct the cloth over the teasle cylinder, by which the cloth is kept properly distended and even, during the operation of raising the pile. In Plate XIII, fig. 4, is an end elevation of a gig upon this improved plan; fig. 5, is a section of the same; and fig. 6, is an elevation of the reversed end of the machine; and in which the positions of the teasle cylinder and the several rollers are seen, and the toothed wheels and other appendages by which they are driven; *a*, is the large gig barrel, or teasle cylinder, in which teasles, cards or brushes may be placed, and to which rotary motion may be given in the ordinary way, or by any other means which may be found eligible; *b*, is the roller upon which it may be supposed that the cloth has been in the first instance rolled or wound; *c*, is a similar roller driven by gear attached to the end of its axle, the periphery of the roller *b*, or of the cloth which is rolled upon it always bearing upon the periphery of this roller *c*, and consequently turned by the friction of contact; *d*, is another roller, on to which the cloth is intended to be rolled as it is drawn from the roller *b*; *e*, is a similar roller to *c*, driven by gear at the end of its axle, which by friction turns the roller *d*, that bears upon it. The tension roller *f*, has its axle mounted in the segment racks *g*, as usual, and it is raised or depressed by turning the shaft and pinion *h*, *h*.

The roller *b*, with the cloth upon it being mounted in the machine, as shewn, the end of the cloth is brought round and under the roller *c*, and the tension roller *f*, and is then conducted over the roller *e*, and made fast to the roller *d*, by its forel and canvas, and the surface of the cloth is made to bear upon the periphery of the teasle cylinder to any extent, more or less, as may be required, by raising or depressing the tension roller.

In order to put the gig in action, rotary motion is given to the teasle cylinder by toothed gear, a clutch box locking it to the power shaft *i*, as shewn in the figure; a pinion fixed on the shaft of the teasle cylinder takes into a carryer wheel *k*, which drives the loose wheel *l*, on the axle of the roller *c*, and this wheel takes into, and drives a similar loose wheel *m*, on the axle of the roller *e*. Now by locking the clutch to the wheel *m*, on the axle of the roller *e*, the roller *d*, will be made to revolve, and to draw the cloth from the roller *b*, under the roller *c*, over the surface of the gig cylinder under the tension roller *f*, up to the roller *e*, when it rolls or winds upon the roller *d*, until all the cloth has been drawn from the roller *b*, upon which it was first rolled. In order to take the cloth back again through the machine for the purpose of being further operated upon by the teasles, the clutch must be unlocked from the wheel *m*, so as to allow that wheel to turn freely upon its axis, and the clutch of the wheel *l*, be projected, in order to lock that wheel to its axle. The roller *c*, will now be driven round by the toothed gear, and cause the roller *b*, to turn also, and to take up or wind on the cloth in the same way as roller *d*, above described.

This alternation of the cloth from the roller *b*, to *d*, and from *d*, to *b*, may be continued until the pile of the cloth has been sufficiently raised, and in order to keep the cloth always at a suitable tenison, a pulley and break is attached to the reverse end of the axis *c* and *e*, as shewn.

The pulley *o*, is fixed on the shaft *c*, and the pulley *p*, on the shaft *e*, and a stud or pin is fixed in the frame at *q*, to which the ends of two cords are made fast; these cords are carried round the pulleys *o* and *p*, and attached at their reverse ends to weighted levers, hence it will be seen that the friction upon either of the pulleys in unwinding the cloth will, by the tension of the cord, be so considerable as to keep the cloth tightly distended, as it is drawn from the roller *b*; but in winding on the cord will be relaxed, and the friction will be so trifling as not to impede the rotation in any degree.

The Patentee states, in conclusion, that in the figures there is shewn upon the shaft *i*, two different sized driving wheels, one upon each end, by which the speed of the gig barrel may be altered as desired, by throwing one or other into gear with the spur wheel upon the axle of the gig barrel by means of the sliding clutches, and that by placing an intermediate wheel, between the pinion, upon the axle of the gig barrel and the wheel *k*, the barrel may be made to reverse its motion, and yet that of the cloth continue unaltered; the wheel *k*, and the intermediate wheel being alternately thrown into gear with the pinion upon the axle of the gig barrel; but that these contrivances he does not consider as new, they are therefore not claimed.—[*Inrolled at the Rolls Chapel Office, Sept.* 1832.]

Specification drawn by Messrs. Newton and Berry.

To THOMAS COOK, *of Blackheath-road, in the county of Kent, Lieutenant in the Royal Navy, for his having invented certain improvements in the construction and fitting up of boats of various descriptions.* —[Sealed 24th April, 1830.]

THE improvements described under this Patent, apply principally to the construction of life boats, and consist, first, in covering the deck of the boat with a water tight canvas, secured by water tight joints all round its edges; and having bags formed in it, which descend below the deck, to contain the legs of the persons sitting in the boat.

Secondly, in the application of buoyant fenders placed all round the outside of the gunwale of the boat, which protects the boat when going alongside of a wreck, and also serve to keep the boat buoyant, in case she should have her bottom stove in. Thirdly, in improvements in the ballasting of a boat, with long bars of metal placed on each side of the keel, resting upon pins or bolts, and suspended by chains; these bars of ballast can be let go and relieve the boat of the weight in case she should fill with water. Fourthly, in the construction of the hooks or holdfast of the ropes, by which the sails are made fast, or other ropes used in the boat, and are so contrived, that they can be let go at a moment's notice, in case of a sudden squall coming on. Plate XIII. fig. 7, is a plan view of a boat, shewing some of the improvements adapted thereto. Fig. 8, is a transverse section of the same; *a, a,* is a shelf, placed all round on the inside of the boat, or it may form part of the deck. The water proof covering extends all over the inside of the boat like a deck, and is jointed to the shelf water tight at *b, b,* by forming a channel in a groove all round in the shelf; the edges of the water proof covering are introduced into the groove, and firmly secured by rods of wood or metal fastenings into the groove by screw bolts or otherwise; *c, c,* are bags, formed in the covering to contain the legs of the persons sitting in the boat.

In order to let out any water which may remain on the deck or covering, holes are made in the sides of the boat through the gunwale, usually stopped tight by screw plugs, but which can be removed and replaced as required; *d, d,* are the buoyant fenders, which are formed of strong water proof canvas, and filled with cork cuttings, shavings, or any other light material, extending round all the sides of the boat, and are firmly secured to it by lashings; *f, f,* are the bars of metal, forming the additional ballast to the boat; these bars rest upon bolts, projecting on both sides of the keel of the boat, and are kept in that situation by collars formed upon the bolts; in case of the boat becoming swamped, these bars can be removed by chains attached to their ends, and let fall away, thereby relieving the boat of their weight.

Fig. 9, shews a side view of one of the liberators to let go the boat's sheet, in case of a sudden squall coming on; *a,* is a metal plate to be fixed upon the part of the boat or vessel by screws; *b,* is a lever turning upon a pin as its fulcrum in the projecting ear on the plate; the shorter end of this lever is connected by a hinge joint to the pin or axle of the sheave or pulley *c*; the other end of its axle fits into a hole made in the plate; *d, d,* is a spring, pressing the longer end of the lever upwards, and keeping the pulley it its place; when the sheet is to be let go, the steersman has only to press down the lever, thereby raising the axle of the pulley out of the hole in the plate, when the tension of the rope will pull the pulley into the position shewn in fig. 10, and slipping off the pulley will let go the sail.

There must be two of these liberators placed, one on each side of the stern of the boat, for the use of the steersman. Fig. 11, shews another of these kind of liberators; *a,* is the plate; *b,* a hook to hold any rope which may require to be let go suddenly; this hook turns upon a hinge joint upon the plate, its end projecting into a hole formed in the piece *c,* which is jointed to the plate at one end; and at the other to one of the toggle jointed levers *d, d*; the end of the other of these toggle levers is jointed on to the plate *a*; *e,* is a handle connected to the toggle joint of the lever, and on pulling this handle into the position shewn in the figure, the hook *b,* will be free to turn upon its joint, and let go the rope. Fig. 12, shews a similar liberator connected with a pulley or sheave *a,* turning upon its axle, in the piece *b*; *c,* is the hook: *d,* the connecting or locking link; *e, e,* the toggle joints, one connected to the head of the axle of the sheave, and the other to the link *d*; *f,* is the handle, and on pulling it as before described, the same effect will be produced as before described.—[*Inrolled in the Inrolment Office, June,* 1830.]

Vessels rendered buoyant by means of bags filled with cork and other light materials, has been already proposed by Mr. R. Dickinson; see his patent of December, 1824, Vol X. page 28, First Series of this Journal.

To MATTHEW TOWGOOD, *of Dartford, in the county of Kent, paper-maker, and* LEAPRIDGE SMITH, *of Paternoster Row, in the city of London, stationer, for their having invented an improved mode of applying size to paper.*—[Sealed 18th August, 1830.]

THIS is an apparatus to be connected to a machine for making paper, on the principle of Fourdrinier's original Patent, and its object is to size the paper as it comes in a continuous sheet from the endless wire web. The operation is performed in this improved apparatus by rollers, the surfaces being supplied with size, and from which the size is communicated to the newly made paper, as it passes between these rollers. The following is the Patentees' account of their invention:—

Our improved mode of applying size to paper, consists in pressing liquid size forcibly upon the surface of the paper, by pouring out or spreading a thin film of liquid size upon the surface or surfaces of certain revolving pressing rollers of a cylindrical form, between the adjacent surfaces of two or more of which pressing rollers the paper is passed, and by means of the pressure given to the paper by those said adjacent surfaces (one or more of which surfaces is or are covered as aforesaid with liquid size,) a suitable quantity of size is applied to the paper, and forcibly presses thereon at the moment when the paper is passing between the said pressing rollers. The said pressing rollers are mounted in the usual manner, of what are called press rollers in paper making machines, viz. the gudgeons at their ends are mounted in a suitable frame, with their axles parallel to each other, and those axles are forced towards each other by screws, weights, or other suitable means, in order that the paper may be compressed with adequate force between the adjacent surfaces of the said rollers, when the said rollers are turned round so as to pass or roll the paper forwards through and between their adjacent surfaces.

The size which is to be applied to the paper must be spread upon the surface of one or more of the said pressing rollers, so as to cover the said surface with a thin and uniform film of liquid size, which may be done either by pouring out the liquid size in a number of small streams or jets, which fall upon or impinge against any convenient part of the circumference of the pressing rollers, and by the revolving motion thereof, its surface becomes covered with a continuous film of size, which will be applied to the paper when it is passing between the pressing rollers, and in so passing, the paper will be compressed between the surface so covered with a film of size and the adjacent surface of the other corresponding pressing roller, that application and pressure taking place as soon as can be done after the size has been so poured out on the said surface of the pressing roller; or else, if more convenient, the size may be spread upon the surface of one or more of the said revolving pressing rollers, by contact thereof, with another revolving roller or rollers, on the surface of which the liquid size may be poured in small streams as aforesaid, or in lieu thereof, the lower part of the latter roller may be immersed in a trough containing liquid size, the surface of the said latter roller being covered with felt, or it may be surrounded by an endless web of felt or other suitable substance, which, being of an elastic and spongy texture, will absorb the liquid size, whilst the felt or other substance is uncompressed, but from which felt or other substance the liquid size which it has so absorbed (or part thereof,) will be readily expressed and squeezed out again, when (by the revolving motion of the rollers), the said felt or other substance is brought in contact with the surface of that pressing roller on which the size is to be spread as aforesaid, and on which surface the size so squeezed out from the felt or other substance will be deposited, and will afterwards be communicated and applied to the paper with pressure, in order to force the size upon the surface of the paper as aforesaid.

And by virtue of our said improved mode of applying size to paper, whilst the paper is undergoing the pressure produced by passing the paper between revolving pressing rollers as aforesaid, that application may be made whilst the paper is in a wet state, or only partially dried.

The size may be applied by our improved mode, either to only one side of the paper, or to both sides thereof, as the substance and quality of the paper which is to be sized may require size to be applied to both sides, or only to one side. The said revolving pressing rollers, by means whereof we apply size to paper on our improved mode, may be added to the ordinary paper making machines (known by the name Fourdrinier's machinery, which operates by means of an endless web of woven wire cloth, moving horizontally, and circulating over a system of revolving rollers); and, by that addition to such machinery, size may be applied to one or both sides of the paper made by the machinery, during the operation of the machinery.

And whereas, the said ordinary paper making machines are now usually provided with drying machinery, consisting of a series of hollow revolving cylinders, which are kept hot by steam within side of them, and the paper (being passed over the external surfaces of these cylinders in close contact therewith), can be dried before it is removed from the machinery; such drying machinery may be used in the said paper making machinery in manner following, in conjunction with the revolving pressing rollers aforesaid, whereby we apply size to paper on our improved mode.

The paper after it comes out from between what are called the dry press rollers of the paper machinery, may be conducted over one or more such revolving steam drying cylinders before it is passed between the said revolving pressing rollers, whereby we apply size to the paper on our improved mode, and the admission of steam into the said drying cylinder or cylinders, may be so restrained and regulated as will cause the said cylinder or cylinders to dry the paper partially, and leave it with only so much wetness as will be the most proper state for applying size thereto on our improved mode; and after the size has been so applied, the sized paper as it comes out from between the said pressing rollers for applying the size as aforesaid may be gathered round a reel in the usual manner, and cut off from that reel into detached sheets of paper, which may be afterwards dried by hanging them up in the air; or else such kinds of paper as will bear rapid drying after being sized. The said sized paper as it comes out from between the said pressing rollers for applying the size as aforesaid, may be conducted over as many other drying cylinders as will dry it completely, before it is gathered around the reel, in order to be cut into detached sheets or otherwise. The said revolving pressing rollers, by means whereof we apply size to paper on our improved mode, may be arranged in a distant machine from any paper making machinery, into which distant machine detached sheets of paper in a wet state, or only partially dried, can be introduced one after another, in order to pass them between the adjacent surfaces of the said revolving pressing rollers, for the purpose of applying size to the paper according to our improved mode. And one or more of the said revolving pressing rollers, whereby we apply size to paper, may be made hollow within, in order to receive steam, which can be admitted in such quantity as will keep the metal of the roller and the film of size, which is spread upon its surface as hot as is desirable for applying size or paper on our improved mode.

Some of the said revolving pressing rollers, whereby we apply size to paper on our improved mode, are covered on the outside with felt, in order that one of the adjacent surfaces, between which the paper is pressed (during its passage between the revolving pressing rollers) may present a yielding substance to one side of the paper, whilst the other of those adjacent surfaces presents a hard and smooth surface of metal to the opposite side of the paper; or, instead of so covering the said revolving pressing rollers with felt, the same may be surrounded by an endless web of felt, which is so extended over a system of supporting rollers as to circulate freely over them; and that web passing through between the adjacent surfaces of the pressing rollers, the felt will be interposed between the metal surface of the rollers, and the paper whilst it is subjected to the pressure occasioned by passing through between the rollers.

Such endless felts may be applied around each of the two pressing rollers, which act on the opposite sides of the paper, so that the paper will be pressed between two felts, and the liquid size may be communicated to the paper from the revolving pressing rollers through the thickness of those endless felts, for which purpose the two pressing rollers between which the felts pass, with the paper including between them, must be kept constantly covered with a continuous film of liquid size either by causing one of the rollers to be immersed at the lower part of its circumference in a trough containing liquid size, by pouring out liquid size in streams or jets against the surface of the pressing rollers between which the said endless felts pass, with the paper included between them, and the size which is spread on the surface of the said pressing rollers, will by their pressing be forced through the thickness of the felts, and applies to the paper which is between them.

The latter arrangement of two endless felts, through which the size is to be pressed, is most suitable for a distinct machine for applying size by our improved mode to detached sheets of paper, and in order to facilitate the introduction of such detached sheets of paper between the two endless felts, two rollers out of the aforesaid two systems of supporting rollers, over which the two endless felts circulate, may be disposed so near to each other as to bring the two endless felts opposite to each other at some distance from the place where the same two felts are compressed between the adjacent surfaces of the pressing roller; and the paper being introduced between the two endless felts at the commencement of the part where they come opposite to each other, will be included between the adjacent surfaces of the two felts, and will remain so included whilst those felts move some distance forwards, and carry the paper with them between the pressing rollers to receive size therefrom, by the pressure rollers forcing the size, with which the surfaces are covered through the thickness of the felts, so as to apply the size to the paper.

For the more full explanation of the means of performing our said invention, we have hereunto annexed a drawing, see Plate XIV, in which fig. 7, represents so much of a Fourdrinier paper machine, as is necessary to explain the manner whereby we have added thereto, the pressing rollers and other apparatuses hereinbefore set forth for the purpose of applying size to paper on our improved mode during the operation of the machine. Fig. 8, represents a distinct machine, containing the pressing rollers and other apparatuses, for the purpose of applying size by our improved mode to detached sheets of paper, which are introduced one after another into the machine.

The construction of Fourdrinier's paper making machine, is so well known to mechanists and paper makers, that it is unnecessary to enter into any detailed description thereof. The additional pressing rollers for applying size to paper on our improved mode, are added to the machine without alteration in any part whereof the action precedes the action of the dry press rollers, between which the paper is pressed a second time in contact with the endless felt; and after coming out from between those dry press rollers, the paper is usually gathered upon a reel, or else in more modern machines, the paper is conducted round the first revolving steam cylinder of the series of drying cylinders; but when additional pressing rollers for applying size to paper on our improved mode are to be added to the machinery, the said reel may be removed from that part of the machine, or else the first of the drying cylinders may be removed, in order to gain a sufficient space for the said additional pressing rollers at *a, b, c,* and also a drying cylinder *d,* may be placed above the dry press rollers, the paper being conducted upwards from those rollers over a carrying roller *e,* which brings the paper in contact with the cylindrical metal surface of the drying cylinder *d,* and the paper passes nearly around that cylinder as far as the conducting roller *f,* from which it proceeds to the additional pressing rollers *a, b, c; g,* is a metal roller, which bears by its weight upon the paper at the highest part of the drying cylinder, and the roller *g*, being covered with felt, presses upon the paper at the opposite side thereof to that side which was pressed in contact with the felt in passing between the dry press rollers. *Note*, the weight of the roller *g*, should be rather less than what will produce the slightest pressure that can ever be required for the most tender kind of paper, and hooks should be applied to the gudgeons at each end of the roller *g*, in order that so much extra weight may be applied by means of loaded levers to bear down the roller as will regulate the pressure to make it suitable for any kind of paper in the same manner as is usually done for the upper rollers of the wet press rolls of the common machinery.

The drying cylinder *d*, is turned round by an endless strap, which is applied upon a sheave at the end of the axis of the lowest of the dry press rollers, and also upon a larger sheave on the axis of the cylinder *d*. The relative diameter of the two sheaves must be accurately in proportion to the relative diameter of the lower dry press roller, and of the steam cylinder *d*, in order that the surface of the latter may move with so nearly the same velocity as the surface of the dry press rollers move, so as to cause the drying cylinder *d*, to take up the paper precisely, as fast as the dry press rollers deliver out the paper, but no faster.

The paper is partially dried by passing round the cylinder *d*, and the admission of steam into that cylinder is regulated so that it may not dry the paper more than is requisite, in order to bring it to the most fit state for applying the size thereto on our improved mode.

The pressing rollers *a*, *b*, *c*, which we add to the machine, may be three in number, placed side by side, with their surfaces nearly in contact; the paper passes down between the first and second pressing roller, and then up again between the second and third pressing rollers, so as to be subjected to two successive pressures. The size is applied to that side of the paper which was uppermost upon the endless web or wire, when the paper is going through the first of those pressures, viz. between the pressing rollers *a*, and *b*, and the size is applied to the opposite side of the paper, when it is undergoing the second of these pressures, viz. between the pressing rollers *b*, and *c*. The middle roller *b*, may be turned round by means of an endless strap, which passes round a large sheave on the end of the axis of the drying cylinder *d*, and also round a small sheave on the end of its own axis; the strap being crossed, in order to turn the said roller round in a proper direction, and the relative diameters of the sheaves must be in true proportion to the relative diameters of the cylinder and the roller, in order that the pressing rollers may take up the paper as fast as the cylinder *d*, delivers it out.

Instead of the strap being applied upon the large sheave of the drying cylinder *d*, the middle pressing roller may be turned round by applying the endless strap upon a sheave of a suitable size, which is fixed on the axis of the lower dry press roller at the side of the sheave. The other two additional pressing rollers *a*, and *c*, may be turned round by the middle roller *b*, and to insure that the three rollers shall turn round together with certainty, a spur wheel may be fixed on the end of the axis of each roller, the teeth of those wheels engaging each other. The gudgeons at the opposite ends of the three pressing rollers are supported in one frame; the bearing bosses for the gudgeons of the two outside rollers being adjusted by setting screws, which advance the three rollers one towards the other, in order that they may press the paper between them. The two outside rollers are covered with felt, but the middle roller is a smooth metal surface.

The paper first passes over about one fourth of the circumference of the roller *a*, near the upper part, and the size is applied on the paper on one side, at the moment when the paper is pressed in passing downwards, between the rollers *a* and *b*; then the paper encompasses the lower half of the circumference of the middle roller *b*, and passes upwards between the rollers *b*, and *c*, size being applied to the other side of the paper at the moment when it receives a second pressure between the rollers *b* and *c*. After that second pressure, the sized paper passes over about one fourth of the circumference of the roller *c*, and is conducted away either to the steam cylinders of the drying machinery, in case the paper is of a quality to bear quick drying after it has been so sized, or if not, then the sized paper may be gathered on a reel in a damp state in the usual manner as fast as it comes away from the third additional roller.

When the sized paper is to be dried in the machine by the steam cylinders, as represented in fig. 7, at *h*, it will be advisable to cover the first of those steam cylinders with felt, in order to protect the fresh sized paper from a too sudden application of heat; and if the revolving motions of the several drying cylinders (which are not shewn in the figure), are communicated from one to another by toothed wheel work, with intermediate wheels in the usual manner of drying machinery, allowance must be made in the diameter of the metal of that first cylinder, for the thickness of its covering of felt, so that the diameter at the outside of the felt covering may be the same, as the diameter of the metal cylinder would be if no such covering was used; but, if the motion of the first steam cylinder, is transmitted to the next cylinder by an endless strap, then the allowance may be made in the diameter of the sheaves, on which the endless strap is applied.

The series of steam drying cylinders are turned round in the usual manner, by means of an endless strap extended from a small sheave on the axis of the lowest dry press roller (or else on the axis of the additional pressing roller), to a large sheave on the axis of one of the drying cylinders, or to a sheave on the axis of a toothed pinion, which links in one of the toothed wheels, on the axis of one of the drying cylinders; and the diameters of the sheaves on which the endless strap is applied, must be truly proportioned, in order that the first steam cylinder may take away the paper just as fast as the third additional pressing roller *c*, delivers it out.

The liquid size is conveyed by a pipe *i*, from an elevated size chest *k*, in which the size is kept warm by means of steam applied within a hollow bottom to the chest, or otherwise. The size is poured out at the lower end of the pipe *i*, in a small stream, which is regulated by turning a cock at the upper end of the pipe, and that stream runs into a long narrow trough *l*, or gutter, which extends horizontally all the length of the rollers, nearly over the space between the two rollers *a* and *b*.

This trough *l*, is fixed fast to an iron bar, which extends across the frame, and the bottom of the trough is perforated with small holes, at equal distances apart, in a row, which holes allow the size to drop or run in small streams, which are directed against the surface of the middle roller *b*, in order to cover the surface of that roller with a film of liquid size; and if there is any excess of size, it lodges in the vacant space between the two rollers, just above their place of pressure; and the paper wrapping over the roller *a*, the size is applied to the surface thereof, and that application is followed instantaneously by pressure given by the rollers *a* and *b*, during an imperceptible space of time; for the rollers being continually in motion, and carrying the paper downwards, it is brought in contact with the size with which the surface of the roller *b*, is covered, at the instant before it passes down between the adjacent surfaces of the two rollers, and the paper being subjected to a considerable pressure between those surfaces, that pressure tends to force the size into the substance of the paper, but does not allow any accumulation of size to remain on the surface of the paper after it has passed through the pressure given between the rollers.

If any excess of size is allowed to flow out of the pipe beyond that which the paper absorbs or carries away with it, that excess flows off from the two ends of the vacant space between the rollers *a* and *b*, at each end of those rollers, and is caught in a large tray *m*, which is fixed beneath the pressing rollers, and has an overflow spout from it to convey the size to a lower size chest *n*, which may be situated in any convenient place, or at the side of the machine, and the size which collects therein must be raised up again, from time to time, into the elevated size chest, in order to be warmed and used over again; *o*, is another pipe from the upper size chest, with a cock at the upper end, and a spout at the lower end, to convey the liquid size into a trough *p*, in which the lower part of a roller *q*, is immersed; the upper part of that roller makes a close contact with the under part of the third pressing roller, and the roller in it is turned round by that contact.

The roller *q*, is partially covered with a fillet of felt wound spiral wise about it, and by revolving in the size contained in the trough, it carries up size to the roller which is covered with felt, and communicates as much size to the surface thereof as will enable the roller *c*, to apply size to the paper at the opposite surface to that to which size was previously applied when the paper received a pressure between the rollers *a* and *b*; the said application of size by the roller *c*, being made at the moment when the paper is pressed between the rollers *b* and *c*. If any excess of size is admitted from the pipe into the size trough *p*, it will overflow by a waste spout, and fall into the tray below.

To keep the size warm, steam may be admitted into the interior of either of the pressing rollers *a*, *b*, or *c*, the rollers being left hollow within for that purpose, and the gudgeons at each end of the roller on which it is supported being perforated like tubes, in order to admit the entrance of steam at one end, and to allow the exit of condensed water at the other end.

The junction of the steam conveyance pipe and of the pipe for condensed water with the ends of the hollow gudgeous, being made tight by stuffing boxes in the usual manner of steam drying cylinders, a cock must be provided in the steam conveyance pipe, to regulate or stop off the admission of steam into the hollow pressing roller as may be required, in order to regulate the heat which shall be given by the steam to that roller. It has been found that the size may be kept as hot as is requisite for sizing many sorts of paper without admitting any steam into the hollow pressing roller.

A scraper of steel, called a doctor, is shewn at *r*; its edge presses against the surface of the roller *b*, and removes any knots of paper or other extraneous matter which may get upon the roller, and the doctor scrapes the surface of the roller clean.

Fig. 8, is a section of a distinct machine for applying size to detached sheets of paper; *a* and *b*, are the pressing rollers mounted one above the other in a suitable frame; the lower one is turned either by a handle fixed on the end of one of its gudgeons, and worked by the strength of a man, or else by a connection of machinery with the end of one of its gudgeons. The upper roller *b*, is hollow, in order that it may not be too heavy, and it is weighted down (to make it act with suitable force of pressure) by hooks applied to each of its gudgeons, and connected with loaded levers in the manner usually practised for the wet press rolls of paper machinery; *c*, *c*, *c*, is an endless web of felt, which circulates over a system of supporting rollers; *d*, *d*, is another endless felt, which also circulates over a system of supporting rollers. Both the endless felts pass between the pressing rollers *a* and *b*, so as to be subjected to pressure therefrom, and the endless felts derive their circulating motion about their respective supporting rollers from the rollers *a* and *b*. The supporting rollers are so placed as to bring the upper endless felt in contact with the lower endless felt at some distance from the place where the pressure is produced between the pressing rollers. The detached sheets of paper are spread out one after another, upon that part of the lower endless felt, which is extended nearly in a horizontal plane at *e*, and the lower felt by moving continually forwards, carries the sheets of paper with it under the upper felt, at the part where that turns under the rollers, so that the paper is introduced between the two felts, and is subjected to the pressure of the pressing rollers *a* and *b*, whilst it remains interposed between the two felts.

The liquid size is applied to the surface of each of the pressing rollers by means of troughs, which are fixed horizontally opposite to the surface of the rollers, with rows of holes in the bottoms of them to pour out the liquid size, and cover the surface of the rollers with continuous felting, in the manner before described, and represented in fig. 7; and in like manner the troughs are supplied with size by pipes, proceeding from an elevated size chest which is not represented, but wherein the size is kept hot by application of steam or otherwise.

The cocks in the pipes should be regulated so as not to allow size to flow into the troughs any faster than the sheets of paper, which are passed in succession through between the rollers *a*, and *b*, will absorb and carry away the size with them. The size with which the surfaces of the rollers are thus covered is forced through the thickness of the endless felts, and applied through their medium from the rollers to the paper, at the moment when the paper together with the two felts between which it is interposed are subjected to the pressure occasioned by passing between the adjacent surfaces of the pressing rollers. There are scrapers placed with their edges in contact with the surfaces of the two pressing rollers, in a suitable manner to act as doctors, and keep the rollers clean.

Note.—The selvages of the endless felts may be extended by sewing edges to them, and to run between suitable guide wheels, in the usual manner of the endless felts of paper machines, in order to keep the felts stretched out to their full width.

Having now set forth the nature of our said invention, and fully described the manner of performing the same, we do hereby declare that what we claim as our invention is the improved mode hereinbefore described of applying size to paper, and which improved mode consists in passing the paper between two or more revolving pressing rollers, the surface of one or more of these rollers being previously covered with a continuous film of liquid size (by some of the means hereinbefore described), at such part or parts of the surface of the roller or rollers, as will produce pressure on the paper during the passage thereof between the said rollers, and which pressure forces the size (wherewith one or more of the said pressing rollers is covered as aforesaid), upon the surface of the paper with a tendency to press the size into the substance thereof, in the manner hereinbefore described.—[*Inrolled in the Petty Bag Office, February,* 1831].

To DAVID SELDEN, *of Liverpool, in the county palatine of Lancaster, merchant, in consequence of a communication made to him by a foreigner residing abroad, for an invention of an improved carding and slubbing engine, for wool, and other fibrous substances.*— [Sealed 22nd Nov. 1831.]

THE following is the specification of this invention, reference being made to the figures represented in Plate XIV.

The improvement for which I have solicited the above recited letters patent, consists in the adaptation of certain mechanism to a carding and slubbing engine, or to a series of carding and slubbing engines, whereby the wool or other fibrous materials may be taken in the form of slubbing direct from the carding engine, without the intervention of the billy, or other similar machine. In order to render this subject perfectly intelligible, I shall commence the description of this improvement at that part of the preparing process called the scribbling.

Let it be supposed that the wool or other fibrous material intended to be operated upon is about to be introduced into an ordinary scribbling engine, but from which I desire to take distinct slivers of certain breadths. The carding cylinder of the scribbling engine being about four feet six inches in length, I should place a board of an inch thick, edgewise, longitudinally over the middle of the feeding cloth, for the purpose of separating the wool or other material upon the feeding cloth into two distinct parcels, and keeping them distinct as the feeding goes on. This division of the material fed in, will cause its separation to be continued as it passes through the engine, and when it arrives at the doffing cylinder, the material may be taken off in distinct slivers. A scribbling engine is so well known, that it is not necessary for me to explain its construction; but the parts to which I am about to refer being additions to that engine, and constituting one of the modifications of the improvement, I have shewn them in the accompanying drawings as attached to an engine for scribbling wool. Fig. 1, is a longitudinal elevation of the machinery. Fig. 2, a transverse elevation, or front view of the same; *a*, may be supposed to represent the large carding cylinder; *b*, the fancy roller or cylinder by which the wool is raised immediately before it comes into contact with the doffing cylinder *c*.

It will be remembered that the wool or other material is separated, by the means above described, into two parts in the engine; consequently the doffing comb *d*, strips it off the doffing cylinder in two slivers. These slivers are severally conducted through a revolving trumpet tube *e*, placed before the doffing cylinder, its centre being level with the lowest action of the doffer comb; from thence the sliver passes to a pair of drawing rollers *f*, mounted immediately opposite to each trumpet. The several trumpet tubes (for there may be two or more, dependent upon the width of the machine) may be made to turn by bands or cords passing from a rotatory drum below and round the pulleys upon the trumpet tubes, [one of which is shewn detached at fig. 6,] which give a slight degree of twist to the sliver as it passes through ; the amount of the twist depending upon the rotatory speed of the trumpet tubes, and also of the drawing rollers, which, as they revolve, conduct the slubbing forward. These drawing rollers may be actuated by a band from a rigger on the axle of any of the rotatory cylinders, carried round a pulley *g*, on which the axle of the lower drawing rollers, when the upper drawing rollers will turn by the friction of their contact. From the drawing rollers the slubbing is carried forward to be wound into a cop, which is done by the following means :—Small drums *h*, *h*, seen best in fig, 2, are mounted on axles turning in bearings in front of the machine, which are driven by a band passed over the pulley *i*, as shewn, or by any other suitable contrivance. Spools or bobbins with pivots are mounted in forks of the inclined arms *k*, *k*, *k*, *k*, and let down so as to bear upon the periphery of the drums *h* ; and as these drums go round, the spools are made to revolve also by their contact. The slubbing therefore being led from the drawing rollers and attached to the spools, as the drums *h*, revolve, the spools revolve also, and cause the slubbing to wind round them, and thus form the cop.

In order to wind the slubbings in uniform coils, and form the cop in the shape of a cylinder with conical ends, the slubbingpasses through a long opening or crook guide formed on a vibrating arm *l*.

These vibrating arms hang on pins in the top rail *m*, passed through slots in the arms, seen best at fig. 2, and are made to traverse to and fro by means of their connection by pivot joints at their upper ends to the sliding rail *n*, *n*. The movement of the sliding rail is effected by an endless screw *o*, on the axle of the small drums *h*, *h*, which takes into a horizontal wheel on the perpendicular shaft *p*, and drives it round. At the top of this shaft *p*, there is a horizontal heart wheel *q*, which acts between two pins *r*, *r*, fixed to the top sliding rail *n*; and as the heart-wheel *q*, goes round, the rail is slidden to and fro upon bearings *j*, *j*, which causes the levers and guides to vibrate, and to traverse the slubbings as they advance, so as to lay the yarns upon the spools in uniform coils, alongside each other from end to end. As the bobbins fill and the cops increasing in diameter, they rise in their forked bearings, and consequently bring the slubbings higher up the crooked guide, which shortens the leverage of the guide arms, and prevents the slubbings from being conducted to the ends of the spools; hence the cops are made with conical ends, and consequently require no heads. The bobbins or spools carrying the cops thus formed are now to be placed in a creel, and as many ends of slubbing as will be necessary to feed the next carding engine, are to be taken from so many cops, and wound upon a large horizontal spool of corresponding length with the cylinders of the carder. But if the wool or other material has been sufficiently scribbled to be taken immediately to the finishing carder, then as many ends are to be taken from the cops in the creel, and wound on to the horizontal spool, as there are intended to be yarns or threads of slubing taken from the doffer of the finishing carding engine. The large spool thus filled with slubbings, is now to be placed horizontally in the situation of the feeding cloth at the back of the finishing carder, as shewn in the drawings at fig. 3, which is a side view or elevation of the finishing carder; and fig. 4, is a section of the same, taken longitudinally through the middle of the machine. This finisher is a single carding engine with two doffing cylinders, covered with fillets of cards of about an inch in breadth, carried round the cylinders in rings, there being about an inch space between each ring or fillet; and the cylinders are so placed one over the other that those parts of the main carding cylinder which is not cleared by the fillets of the upper doffer, will be cleared by the fillets of the lower doffer.

The large spool or bobbin filled with the slubbings, as described, is to be placed horizontally atthe ck of the machine, its pivots turning in bearings as at *a*, in figs. 3 and 4; and the ends of the slubbing taken therefrom are severally to be passed through distinct apertures between the partitions of the guide rack *b*, in order that each end of fibres may be directed to a distant fillet on the doffing cylinders. The wool or other material thus introduced is carried forward by the feeding rollers *c, c*, and after having passed through the engine, and been operated upon in the usual way, it is taken from the fillets of the two doffing cylinders *d, d*, in front, by the vibrating doffer combs *e, e*, actuated by a rod and crank *f*, in the ordinary manner. In front of each fillet a rotatory tube *g*, and pair of drawing rollers *h, h*, is mounted, a series of which extend across the machine. To the rails which support the rotatory tubes *g*, there are affixed guide racks *i, i*, formed of wood in thin slips, their carved edges standing in the grooves between the fillets; these are for the purpose of separating the slivers, keeping their fibres together, and conducting them severally to the respective tubes. The lower drawing rollers *h*, are made to revolve by pulleys and bands leading from any convenient rotatory part of the engine; the upper ones turn by friction. Whatever may be the speed given to the doffing cylinders, that of the drawing rollers should be slower by about one third or fourth of the speed, in order that the fibres of the wool or other material may not be drawn apart, but be laid in close spirals in the slubbing; and this twist will be greater or less according to the speed of the rotatory tubes *g*; but it is only desirable to give the slubbing such a slight twist as shall just keep its fibres together.

From the drawing rollers the slubbings pass forward to the winding apparatus, which is placed in a frame in front of the carding engine, and connected thereto by bevel gear, as shewn in the side view, fig. 3. This winding apparatus consists of a frame carrying two drums *k, k,* which turn in vertical directions on axles placed longitudinally. Over these drums an endless band *l, l, l, l,* passes, shewn best in the front view at fig. 5. Two planks *m, m,* fixed into the frame, are placed under the band for the purpose of supporting it; and to the edges of these planks forked standards *n, n, n,* are affixed, in which the pivots of a series of horizontal bobbins *o, o, o,* are intended to turn.

These bobbins are formed by cylindrical pieces of wood with small metal pivots, which drop into the forked standards *n, n,* and bear upon the endless band *l, l.* On rotatory motion being given to the drums *k, k,* through the bevel gear shewn in fig. 3, or by any other convenient means, the endless band *l, l,* is carried along the planks *m, m,* in the direction of the arrows, and the bobbins *o, o,* are made to revolve on their axes by the friction of the travelling endless band. The ends of slubbing therefore being conducted from the drawing rollers *h, h,* and passed over the guide rods *p, p,* mounted in semicircular or bent arms, are severally attached each to one of the bobbins; and hence as the travelling endless band goes on, the bobbins turn upon their axes, and wind on the slubbing.

In order that the slubbings may be traversed, and laid in uniform coils side by side upon the bobbins, from end to end, the bent arms, with the guide rails *p, p*, are made to advance and recede by a reciprocating movement, which is communicated to them through the long vibrating levers *q, q*, that carry the guides, and which levers are fixed on the ends of a shaft *r, r*, extending along the front of the winding frame. To this shaft is also attached an arm *s*, by which the shaft and its vibrating levers are moved. A long connecting rod *t, t*, that passes longitudinally through the machine, under the carding cylinder, is attached to the arm *s*, at one end by a staple, and at its reverse end is acted upon by a heart wheel. This heart wheel therefore being turned by any convenient connection to the rotary parts of the carding engine, causes the connecting rod *t*, to slide to and fro, by which movement the arm *s*, the shaft *r, r*, and the levers *q, q*, carrying the guides, are made to vibrate, and to traverse the slubbings from end to end of the bobbins as they wind on. But as it is desirable that the cops upon the bobbins should be formed with conical ends, there is a contrivance by which the traverse of the guides may be progressively shortened as the cop increases in diameter.

It will be perceived in fig. 4, that there is a small pinion *u*, turning upon an axle in the staple near the end of the connecting rod *t, t*, which acts in a rack formed in the arm *s*. Upon the axle of this pinion a small pendant lever *v*, is fixed, and also a ratchet in wheel *w*; and to the upper arm of this pendant lever a check string *x*, is attached, the reverse end of which string is made fast to a fixed staple. When by the larger diameter of the heart wheel comes round the connecting rod *t*, with the arm *s*, is moved forward; the check string will draw the upper arm of the small pendant lever *v*, and cause the pinion to turn, and to proceed a tooth or two up the rack, which by so doing raises that end of the connecting rod; and the palls *y*, in the teeth of the ratchet wheel prevent it from returning. Hence it will be perceived, that by a succession of strokes, the connecting rod will be raised to the top of the rack, by which means the extent of vibratory motion of the levers will be lessened, and consequently the guides will progressively shorten the traverse of the slubbings, and produce the cops with conical ends as required.

Lastly, I wish it to be understood that as the filleted doffer cylinders, and the tubes, as well as most of the other parts of the machinery having been long known, and in use, I do not claim them separately as forming any part of my invention, but I claim the novel arrangement of the whole machinery for giving to the doffing cylinder a motion exceeding that of the drawing rollers, and using the comb conjointly with the rotatory tube, by which I am enabled to produce an accumulation of fibres at that point, which accumulation is to be taken up by the rotatory motion of the tubes, and to cause the fibres to take spiral directions in the threads of slubbings, so as to throw the ends of the fibres upon the outside; and by varying this difference of motion between the doffers and the rollers, to lay the fibres more or less spirally as may be desired. When a slubbing or sliver of worsted should be made, the first described scribbling machine or breaker must have two doffing cylinders, one above the other, with a winding apparatus to each, and with two tubes to each, so that four slivers, instead of two, will be produced. Now by placing the upper doffer at a proper distance from the swift or main cylinder, just so much of the wool from the same will be received on it as may be desired, and this will be the longest wool. That proportion of wool or noil which is allowed to pass the first doffing cylinder, is received upon the second, and the swift or main cylinder is cleared. Thus, two slivers of the longest wool may be taken and wound upon the bobbins from the upper doffer, and the shortest wool may be wound on two bobbins from the lower one; answering in a measure the purpose of combing in worsted, and which in woollens serves to give the manufacturer the best part of his wool from the upper doffer for his warps, and from the lower the most suitable for his weft. This application of two doffers to sort the wool, or separate the long from the short fibres, I also claim as new, and forming part of this invention.—[*Inrolled in the Rolls Chapel Office, May*, 1832.]

Specification drawn by Messrs. Newton and Berry.

To JACOB PERKINS, *of Fleet street, in the city of London, for his invention of improvements in generating steam.*—[Sealed 2nd July, 1831.]

THIS invention professes to be "a new method of producing a rapid generation of steam," and consists in an apparatus that may be constructed with, or added to the steam boiler or generator of steam. This apparatus may be considered as a lining to the internal surface of the boiler or generator, admitting the water to circulate between the two passages that are left open at the lower and upper parts of the lining, whereby that heat given off from the inner surface of the boiler, will be rapidly carried to the surface of the water, and given off with the steam; and such boilers may bear a higher degree of heat applied to them without injuring the metal.

The invention will be more clearly perceived by reference to the figures represented in Plate XIII. where fig. 14, is a longitudinal section of a boiler, consisting of a series of tubular vessels, descending from a flat plate, which plate represents the ordinary bottom of a boiler. These tubes, filled with water, descend into the furnace, presenting a very considerable surface to the flames and heated vapours which play around them, causing the water contained in the tubes to boil, and throw off steam into the upper part of the boiler.

There are internal tubes within these, represented upon a larger scale in section by the detached figure 15. The outer tube is marked *a*, *a*, and the inner tube *b*, is open both at top and bottom. These are the linings which constitute the invention or improvement. The inner tubes rest on the lower internal parts of the larger or outer tubes, and are supported by legs, which form a free space all round, and also at the bottom, in order to produce the free circulation of the water through both.

The boiler in fig. 14, is represented as formed with two domes, connected at their upper parts by a pipe, which allows the passage of the steam, and equallizes its pressure in both; and there is also a pipe of communication, which causes the water to flow to the same level in both domes; there is a pipe for supplying the water, and a pipe for conducting the steam to work the engines; also a safety valve.

The tubes descending from the plate may be ranged in any order to suit convenience, and in any number that shall be found desirable, according to the required capacity of the boiler, as the invention does not consist in the form of the boiler, but in the adaptation of the linings.

" On lighting a fire in the furnace, the heat will strike against the outer surface of the tubes *a*, and thus give off heat to the water which is in contact with the metal; and such heated water will rise to the surface, and give off so much of it as is converted into steam; while the inner column of water contained in the tub *b*, will descend, and continue it fill up the space of that part which has become heated, and is rising to the surface. Thus will a very rapid circulation of the water take place in each of the tubes, caused by the inner tubes or linings; and by such rapid circulation, however great the degree of heat applied to the outer area of the tubes, the rapid circulation will carry up the same, and give it off at the surface with the steam, and at all times keep the tubes at a temperature which will not injure the metal, as would be the case were the inner tubes or linings not used."

Fig. 16, shews another mode of adapting the same principles, by the section of what is commonly called a waggon boiler, for a low pressure engine; or the same might be adapted to a cylindrical boiler for high pressure. Within the boiler curved plates *c, c, c*, are attached by pins or rivets, forming linings running from end to end of the interior surface of the boiler, but kept apart from the surface of the boiler, and open at the bottom and top to admit the free passage of the water between; by means of these linings a rapid circulation of the water is effected in the direction shewn by the arrows.

In the last described figure it will be seen that two separate fire places are used, " the object of which is, that the partitions of brick work which run the whole length under the boiler, should prevent the fire acting under that part of the boiler, by which means the water over such brick work always contains less caloric than that which is directly acted upon by the fire; and by the action caused by the partitions or lining *c*, a rapid circulation will be produced, which will take up the heat more quickly from the inner surface of the boiler, and give it off with the steam."

"Having now described the natureof my invention, and having shewn my improvements as applied to different descriptions of steam boilers, it will be evident from the nature of the invention, that the shapes of the boilers may be varied without departing from my invention, which I hereby declare to consist in applying the linings *c*; by any apparatus, upon the principles, and by the method above described, for the purpose of obtaining a rapid circulation of the water in steam boilers or generators, and thus causing the water to take up the heat from the inner surface of such steam boilers or generators, and thereby producing a rapid generation of steam with less injury to the metal or material of the boiler as above described.—[*Inrolled in the Inrolment Office, January,* 1832.]

New Patents

GRANTED IN ENGLAND IN 1832.

To William Joyce, of Bow, in the county of Middlesex, harness maker, for his invention of certain improvements in the making or constructing of collars for horses and other animals.—Sealed 22nd August, to inroll within 6 months.

To Daniel Horton, and George Horton, of the Leys iron works, in the parish of Kingswinford, in the county of Stafford, iron masters and copartners, for their invention of an improved puddling furnace for the better production of manufactured iron in the process of obtaining it from the pig.—Sealed 7th Sept. 6 months.

To George Jones, of Wolverhampton, in the county of Stafford iron master; James Foster of Stourbridge in the county of Worcester, iron master; and John Barker, and John Jones, both of Wolverhampton aforesaid, iron-masters, for their invention and improvement on the process now in use for producing or making malleable iron. —Sealed 8th September, 6 months.

To Caroline Eliza Ann Burges, of Beaufort, in the county of Sussex, spinster, for her invention of an improuement, or apparatus for sketching, drawing, or delineating, —Sealed 8th September, 6 months,

John Osborne Mosley, and George Bell, both of Primrose Hill, Salisbury-square, in the parish of St. Brides, in the city of London, dye-sinkers and embossers copartners for their invention or improvement in the making or manufacturing of pill or other boxes, from paste board paper or other materials which improvements are applicable to other purposes.—Sealed 8th September, 6 months.

To Nicholas Troughton, of Swansea, in the county of Glamorgan, copper smelter, for his invention of an improvement or improvements in preparing the materials for, and in producing a cement, applicable to building and other purposes, which he denominates metallic cement.— Sealed 8th September, 2 months.

To Pierre Frederic Fischer, of Chester Place, Regent's Park, in the county of Middlesex, gentleman, for an invention communicated to him by a certain foreigner residing abroad, of certain improvements in piano fortes. —Sealed 8th of September, 6 months.

To John Brown, of Heaton Norris, in the county of Lancaster, cotton manufacturer, and Thomas Heys, of Heaton Norris, aforesaid, book-keeper, for their invention of an improvement in the machinery used for spinning cotton, silk, flax, and other fibrous substances, commonly called throstles.—Sealed 8th of September, 2 months.

To Richard Badnall, the younger formerly of Ashenhurst-Hall, near Leek, in the county of Stafford, but now residing in the Town of Douglas, in the Isle of Man, Gentleman, for his improvement in the construction or formation of the frames or rails, or lines of rail or frame roads upon which locomotive engines shall or may work. —Sealed, 1th Sep. 6 months.

To Richard Whytock, of the city of Edinburgh, in that part of Great Britain called Scotland, manufacturer, for his invention of an improved method or manufacture which facilitates the production of regular figures or patterns, on different fabrics particularly velvet, velvet pile and Brussels Wilton, and Turkey carpets. —8th Sep. 6 months.

To Richard Trevithich, of Camborn, in the county of Cornwall, engineer, for his invention of an improvement or improvements on the steam engine, and in the application of steam power to navigation and to locomotion.— 22nd Sep. 6 months.

To John Howard Ryan, of Gillingham-street, Pimlico, Esq. for an improved mode of preserving paper canvas, cloth, and cordage, for ships and other uses, and the raw materials of hemp, flax, or cotton, from which the same may wholly or in part be made.—22nd Sep. 6 months.

CELESTIAL PHENOMENA, FOR OCTOBER, 1832.

D.	H.	M.	
1	0	0	The Earth in the plain of ♄'s ring.
1	0	0	Clock after the ☉ 23 sec. 10m.
1	0	0	☉ rises 6h. 13. sets 5 h. 47 m.
1	0	0	☽ rises 10 h. 11 m.
1	0	0	☽ passes the meridian, 6 h. 2 m.
1	0	0	☿ passes the meridian, 23 h. 8 m.
1	7	37	☽ in □ or first quarter.
1	9	46	Jupiter's first sat. will immerge.
2	8	1	Jupiter's fourth sat. will immerge.
2	10	57	Jupiter's fourth sat. will immerge.
2	19	0	☽ in Apogee.
5	0	0	Clock after the ☉ 11 m. 37 s.
5	0	0	☉ rises 6 h. 21 m. sets 5 h. 49 m.
6	0	0	☽ rises 1 h. 1 m.
7	0	0	Vesta R. A. 13 h. 7 m. dec. 1. 15. S.
7	0	0	Juno R. A. 18 h. 1 m. dec. 1. 39 S.
7	0	0	Pallas R. A. 23 h. 33 m. dec. 8. 52. S.
7	0	0	Ceres R. A. 2 h. 50 m. dec. 5. 3. N.
7	7	42	☽ in conj. with ♃ long. 20. in Taurus, ☽ lat. 3. 48. S. ♃ lat. 5. 1. S. diff. of lat. 1. 13.
8	0	0	☽ passes the meridian, 11 h. 30 m.
8	11	41	Jupiter's first sat. will immerge.
9	7	36	Ecliptic opposition or ○ full moon.
10	0	0	Clock after the ☉ 13 m.
10	0	0	☉ rises 6 h. 31 m. sets 5 h. 29 m.
10	0	0	☽ rises 6 h. 10 m.
10	0	0	☽ passes the meridian 0 h. 16 m.
10	6	10	Jupiter's first sat. will immerge
10	0	0	☿ passes the meridian 23 h. 31 m.
12	9	54	Jupiter's third satellite will immerge.
13	0	0	♄ passes the meridian 22 h. 18 m.
13	0	0	Jupiter passes the meridian 10 h. 11 m.
13	0	0	♂ passes the meridian 15 h. 6 m.
13	0	0	♀ passes the meridian 1 h. 20 m.
13	14	46	☽ in conj. with ♂ long. 14. in Cancer, ☽ lat. 2. 36. S. ♂ lat. 54. S. diff. of lat. 1. 42.
14	0	0	☿ stationary.
15	0	0	Clock after the ☉ 14 m 12 sec.
15	0	0	☉ rises 6 h. 40 m. sets 5 h. 20. m.
15	0	0	☽ rises 9 h. 27 min
15	13	36	Jupiter's first sat. will immerge.
16	8	34	☽ in □ or last quarter.
16	7	29	Jupiter's second sat. will im.
17	8	5	Jupiter's first sat. will immerge.
17	7	0	☽ in Perigee.
19	0	0	Vesta R. A. 13 h. 30 m. dec. 4. 26. S.
19	0	0	Juno R. A. 18 h. 18 m. dec. 3. 27. S.
19	0	0	Pallas R. A. 23 h. 56 m. dec. 11. 12. S.
19	0	0	Ceres R. A. 2 h. 50 m. dec. 4. 31. N.
20	14	7	☽ in conj. with ♄ long. 23. in Scorpio ☽ lat. 3. 56. N. Sat. lat. 1. 55. N. diff. of lat. 2. 1
20	0	0	Clock after the ☉ 15 m. 9 sec.
20	0	0	☉ rises 6 h. 50 m. sets 5 h. 10 m.
20	0	0	☽ rises 2 h. 16 m.
20	0	0	☽ passes meridian 9 h. 24 m.
22	0	0	☉ enters Scorpio
23	6	49	Ecliptic conj. ● or new moon.
23	7	10	☽ in conj with ☿ long. 29. in Libra, ☽ lat. 5. 0. N ☿ lat. 37 N. diff. of lat. 4. 23.
23	10	5	♃'s second satellite will im.
24	10	0	Jupiter's first satellite will immerge.
25	0	0	♅ stationary.
25	0	0	Clock after the ☉ 15 m. 49 s.
25	0	0	○ rises 6 h. 59 m. sets 5 h. 1 m.
25	0	0	☽ sets 6 h. 50 m.
25	0	0	☽ passes the meridian 1 h. 31 m.
25	0	0	☿ passes the meridian 0 h. 5 m.
25	0	0	♀ passes the meridian 1 h. 34 m.
25	0	0	♂ passes the meridian 14 h. 16 m.
25	0	0	♃ passes the meridian 9 h. 22 m.
25	0	0	Saturn passes the meridian 21 h. 37. m.
30	0	0	☽ passes the meridian 5 h. 37 m.
30	0	0	☽ sets 9 h. 52 m.
30	0	0	○ rises 7 h. 9 m. sets 4 h. 51 m.
30	0	0	Clock after the ○ 16 m. 12s.
30	16	0	☽ in apogee.
31	4	6	☽ in □ or first quarter.
31	11	57	Jupiter's first satellite will immerge.

Jupiter will be in a favourable situation for observation during the whole of this Month.

J. LEWTHWAITE. Rotherhithe

METEROLOGICAL JOURNAL,

1832.	Thermo.		Barometer.		Rain in inches	1832.	Thermo		Barometer.		Rain in inches.
	Hig.	Low	Hig.	Low.			Hig.	Low	Hig.	Low.	
Aug 26	61	43	29,76	29,69	1,	Sep. 11	64	40	30,11	30,00	,075
27	61	39	29,72	29,52	,05	12	63	37	30,17	30,13	
28	59	41	29,26	29,18	,525	13	66	50	30,03	29,92	
29	57	43	29,35	29,28	,15	14	64	45	29,90	29,80	,025
30	59	44	29,51	29,44	,15	15	62	41	30,04	29,90	
31	63	42	29,72	29,68		16	64	41	30,15	30,09	
Sep. 1	63	42	29,69	29,52	,425	17	63	45	30,22	30,07	
2	63	44	29,82	29,82	,575	18	61	50	30,04	29,94	
3	65	41	30,17	30,02		19	57	35	30,36	30,10	
4	63	40	30,21	30,16		20	61	30	30,44	30,42	
5	64	39	30,05	30,00		21	65	38	30,46	30,44	
6	65	41	29,94	29,80		22	64	39	30,42	30,31	
7	61	40	29,76	29,69	,075	23	67	40	30,29	30,24	
8	60	41	29,69	29,60	,025	24	73	38	30,33	30,30	
9	65	48	29,91	29,84		25	71	40	30,35	30,30	
10	62	50	29,84	29,75	,05						

Edmonton. CHARLES HENRY ADAMS.

Latitude 51° 37 32 N.
Longitude 3 51 West of Greenwich.

ried round a ring formed chamber rendered air tight; *a, a, a,* are the flaps or pistons attached by hinge joints to the wheel *b*, which turns upon an axle in the centre; *c*, is a cam fixed to the side of the box, for the purpose of guiding the pistons or flaps by means of their tail pieces, which act against the periphery of the cam as the wheel goes round.

At the lower part of the circular chamber there is a curved ledge *d*, projecting from the side of the box, which, as the flaps or pistons come round in the direction of the arrow, cause them to fall back into the periphery of the wheel, and *e*, is a block, or stop, which closes up a part of the chamber.

When the wheel is driven round by a winch, or other power applied to its axle, the flaps or pistons fitting closely to the surfaces of the chamber, produce a vacuum or exhaustion of the air behind them, which causes the water to rise in the syphon pipe *g*, as in the former instance, and which, descending with the rotation of the wheel, is discharged at the aperture or tube *h*.

The flaps or pistons having fallen into the periphery of the wheel, as they proceed along the lower part of the chamber, when they have respectively passed the stop or block *e*, the cam *c*, takes hold of the tail of each flap, and turns it over upon its hinge joints into its former position, where it again becomes a piston, carrying on the pumping or exhausting operation, and drawing the water up the syphon pipe from the reservoir below.

It is considered that this apparatus may be made to drive machinery where only a small power is required, as in turning laths, and other operations of that kind. In this case the syphon pipe is removed, and a perpendicular pipe attached to the aperture *g*, through which a descending column of water is to pass from a reservoir at the top of the building, in which the machinery is placed By these means the pistons will be carried round with a power equal to that of the weight of the descending column of water, and that power communicated from the axle may be employed to drive the lathes or other machinery.—[*Inrolled in the Inrolment Office, February,* 1829.]

To PHILIP FOXWELL, *clothier,* WILLIAM CLARK, *cloth-dresser,* and BENJAMIN CLARK, *cloth dresser, all of Dye House Mill, in the parish of Minchin-hampton, in the county of Gloucester, for certain improvements in machinery for shearing, cropping, or cutting, and finishing woollen, and other cloths, and cassimeres.*—[Sealed 19th August, 1828.]

THE subject of this Patent applies to a machine for shearing or cropping the pile from woollen cloth. The general construction of the machine to which these improvements are adapted, does not appear to differ materially from the shearing machines formerly made by Mr. G. F. Davis, of Nailsworth, and against whom several actions at law were maintained by Mr. Lewis in 1828, for an infringement of parts of their prior patent rights; a particular account of which, with accurate representations of the machines are introduced in the Second Volume of the Second Series of this Journal.

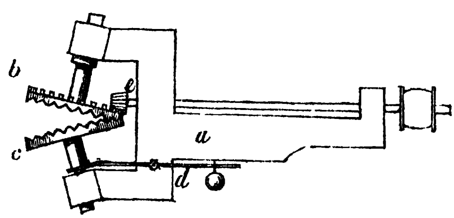
In this machine the cloth tightly distended by hooks, or what are called habits, travels breadthwise, that is, from list to list, under the shears, and the pile of the cloth becomes cropped or shorn as it passes, by a vibrating blade, acting against a fixed ledger blade; there is also a transversing brush for raising up the pile, previously to its coming under the operation of the shears, which brush is worked to and fro by a crank.

There does not appear to be any novel features in the construction of the parts or movements of the machinery, but the claims of invention are, first, the adaptation of a japanned or varnished cloth, as a bed for the shears to act upon, and second, a shaft with ratchet wheels and palls, for drawing up tightly the habits and lists.—[*Inrolled in the Inrolment Office, February,* 1829.]

To Edward Barnard, *of Nailsworth, near Minchinhampton, in the county of Gloucester, clothier, for certain improvements in weaving, and preparing cloth.*—[Sealed 19th, August 1828.]

There are two objects proposed under this Patent; the first is, an apparatus for keeping the selvages or lists of cloth uniformly distended, while weaving in the loom; the second is, a contrivance for raising the pile or nap of the cloth, previously to shearing it.

The figure shewn below represents one of the appara-



tus for distending the cloth. The frame *a*, is to be fastened to the breast beam, or to the side of a loom, by screws, or any other convenient means; the two indented wheels *b* and *c*, extending into the loom, so as to allow the list or selvage to pass between the angle of the two wheels, and to be taken hold of by the parts in contact.

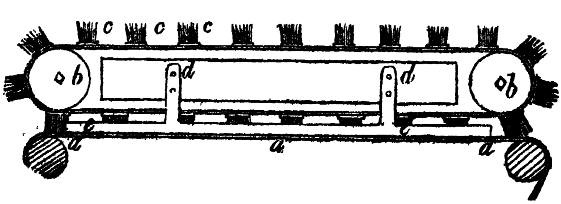
The teeth of both wheels are made extremely obtuse, so that they may only take hold, not enter into the list or edge of the cloth.

The wheel *c*, is pressed up into contact with the wheel *b*, by a weighted lever *d*, or by a spring, which acts under a shoulder in the stem or shaft of the wheel *c*, and by that means the teeth of the two wheels are kept in contact at one point.

At the back of the wheel *b*, there is a circle of teeth, into which a pinion *e*, works, and this pinion being driven by a band and pulley on its axle, turns the wheel round, and draws the list or selvage of the cloth to the desired width.

It will of course be understood that one of these apparatus is to be placed on each side of the loom, taking hold of the list or selvage of the cloth as it passes, and thereby keeping it distended; but as the progress of the cloth is slow, so must be that of the wheels *b*, *c*, the pinion *e*, therefore is made to turn very slowly, by an occasional movement of the pulley, actuated by the advance of the slay, through the agency of a ratchet and click, or by any other convenient means.

The contrivance by which the pile or nap of cloth is proposed to be raised, when about to be shorn, consists in a series of brushes, made to travel across the cloth while



the cloth is passing through the shearing machine. The figure above represents the cloth *a*, *a*, *a*, tightly distended and supposed to be passing through a shearing machine; two pulleys *b, b,* are mounted in the machine, and made to revolve upon their axles, by any suitable contrivance; over those pullies an endless band is passed, which carries a series of brushes *c, c, c,* and on the wheels *b, b,* turning, the brushes are made to travel across the cloth, and to raise the pile ready to be taken hold of and croped by the shears, which are in operation behind the brushes, but not shewn in the figure,

From a board *d, d,* two arms extend, which support a rod *e, e.* This rod is intended to press upon the surface of the cloth, for the purpose of keeping it smooth as it advances through the machine.

This last described piece of mechanism is mounted on arms or levers extending from the front of a shearing frame, and is enabled to rise or fall on hinge joints, for the convenience of being readily raised up from the cloth.—[*Inrolled in the Inrolment Office, February,* 1829.]

Report of the Committee of the House of Commons on

Steam Carriages.

(Continued from p. 36.)

"The only fair plea for charging Tolls on steam Carriages in proportion to their weight, is to prevent a load from being propelled or carried which would permanently injure the road, Within this limit it would be as injudicious to interfere with their progressive efficiency, (which can only result from the improvements of the machinery and the system of generating and applying Steam), as it would be to tax Carriages drawn by large and well bred horses more heavily, than such as were drawn by horses in worse condition, and of smaller size and power.

"To charge a Toll according to the number of passengers conveyed, is scarcely less objectionable. If a fluctuating Toll be intended, it would be as inadmissible as to propose a similar mode of charging for fast Coaches, and would be open to all the cavil and interruptions to which a fluctuating Toll would be liable. If the Toll were fixed according to the number of passengers the Carriage were capable of conveying, it would imply the necessity of a licence, limiting the number of passengers, and cramping the progress of improvement of a machine, the capabilities of which can only be ascertained slowly and by continued experiment.

"The trustees of the Liverpool and Prescot road have already obtained the sanction of the Legislature to charge the monstrous Toll of 1*s.* 6*d.* 'per horse power,' as if it were a national object to prevent the possibility of such Engines being used. Besides they have supplied no standard of their own conception of horse power; engineers have differed very much in their estimates of this power; there is not, therefore, much probability that the opposite interests of a Steam Coach proprietor and Toll collector would lead to any agreement as to the meaning of the term. But suppose the Legislature were to settle this point, and to arrange that a certain length of stroke and diameter of cylinder should represent a certain power, we still fail to ascertain that which alone it is essential to know; viz. the actual efficiency of the Engine. Can we regulate the density of Steam at which an Engine of a given size should be worked? To be effectual, it would be also necessary to ascertain the quantity of water consumed, and even this check would be inadequate with an Engine on Mr. Trevithick's principle. If the toll be left as at present on 'horse-power,' it would be the obvious interest of the proprietor to work with the smallest nominal power, but to increase as much as possible the force of his Steam, thereby increasing the probability of explosion.

"Some Trustees have placed the Toll upon the number of wheels. The Committee would object to this mode of charge, if only because it interferes between the rival modes of Steam travelling, and gives a bounty in favour of that, in which the Engine is placed on the same carriage with the passengers, The opposite plan, of separating the Engine from the Carriage, is that which probably the public will prefer, until the safety of the mode of conveyance shall have been fully ascertained.

"There is still a more serious objection to this mode of charge; it tends to discourage the use of separate Carriages; although it must be evident, that if a certain weight be carried, it will be much less injurious to the road when divided over eight wheels, than when carried on four only. On this point the Committee must again refer to Mr. Macneil's evidence. They cannot, therefore, recommend the House to adopt a scale of Toll, which shall increase in inverse proportion to the injury done to the road. It will be seen in Mr. M'Adam's evidence, that the Toll on Steam Coaches imposed by the Metropolitan Roads Act, is liable to this objection.

"Some of the local Acts have placed an unvarying Toll on Steam Carriages. This, if moderate, would be unobjectionable; but the Committee could not propose any sum which would adapt itself to the necessary varieties of expence in keeping up different roads, by which the Tolls on common Carriages have been regulated. A fixed Toll has, too, this disadvantage, that light experimental Carriages, or such as are built solely for speed, would be liable to the same toll, as Steam Carriages heavily laden.

"The Committee do not anticipate that, for a considerable period, Steam will be used as a propelling power on common roads for heavy waggons. It appears to have been the general opinion of the witnesses, that in proportion as the velocity of travelling by Steam on common roads is diminished, the advantages of Steam over horse power are lost. The efficiency of horses in draught is rapidly diminished as their speed is increased; while, on the contrary, the weight which could be carried or propelled, at any great velocity, by Steam, could not be more cheaply conveyed, were the speed decreased to that of the slowest waggon.

"As speed, therefore, is the cause of greatly increased expense where horses are used, while with Steam it is comparatively unimportant, it is probable that the latter will be chiefly resorted to when rapidity of conveyance is required. Mr. Gurney considers, that, under four miles per hour, horses can be used in draught more economically than Steam. Should it, however, be deemed profitable to convey heavy goods by Steam Carriages, the Committee recommend that there should be as little interference as possible with the number of carts employed; as the effect on the surface of roads would be infinitely more injurious if heavy loads were placed on a single cart, than if the same weight were divided over several. The Committee recommend that where Carriages, containing heavy goods alone, are propelled by Steam, the weight of the load should be charged, without reference to the number of carts on which it may be carried.

"In conclusion, the Committee submit the following Summary of the Evidence, given by the several witnesses, as to the progress made on the application of Steam to the purposes of draught on common roads.

"Sufficient evidence has been adduced to convince your Committee,—

1. That Carriages can be propelled by steam on common roads at an average rate of ten miles per hour.
2. That at this rate they have conveyed upwards of fourteen passengers.
3. That their weight, including engine, fuel, water and attendants, may be under three tons.
4. That they can ascend and descend hills of considerable inclination with facility and safety.
5. That they are perfectly safe for passengers.
6. That they are not (or need not be, if properly constructed) nuisances to the Public.

7. That they will become a speedier and cheaper mode of conveyance than Carriages drawn by horses.
8 That, as they admit of greater breadth of tire than other Carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such Carriages will cause less wear of roads than coaches drawn by horses.
9, That rates of Toll have been imposed on Steam Carriages, which would prohibit their being used on several lines of road, were such charges permitted to remain unaltered."

Mr. Gurney, in commenting upon this Report, observes, Colonel Torrens' arguments are so conclusive, in regard to the effects of Steam Carriages to agriculture and commerce, that any further remarks here will be unnecessary and presumptuous. I would, however, call to mind, as a *practical illustration* of the truth of these arguments, the immense benefit which has already accrued to agriculture in particular, by the substitution of *wheel carriages for pack horses.* The state that society, and agriculture especially, would be in, had not this introduction of machinery taken place, may easier be conceived than pointed out. In short, the number of horses necessary to do the work which is now done by wheel carriages, would consume almost all the produce of the country. This improvement, with the substitution of the Steam Engine for horse power in stationary situations, has alone enabled this country to support its increased population.

The advantages of machinery are too well know to require any observation; but the propable effects on society, so far as this particular machine is concerned, viz., the Steam Carriage, I would extract from the minutes my evidence given before the Committee of the House of Commons.

I said "generally, in regard to the main improvements on Steam Engines, by which this country has been so much benefitted, and the prospective advantages to be derived from Steam Carriages, that they always have been and will be in direct ratio with the removal of horses. The great and splendid improvements of Mr. Watt have generally been supposed to be principally connected with the separate condenser of the Steam Engine; but before Mr. Watt's day, we could draw off the water from our mines in Cornwall, and we could do a variety of other simple work by the Steam Engine: and so far the improvement of Mr. Watt was simply productive of a saving of fuel. I consider that the great national advantage arising from Mr. Watt's improvement, has been his application of the Steam Engine to machinery, and the extent of that advantage to the community has been in direct proportion to the removal of horse power: a most unproductive labourer and a dead expense to the country.

"If this view of the subject be entertained, the application of steam to propelling carriages on common roads will be as important above its application to machinery, generally, as the number of horses employed in locomotion, exceed those necessary to machinery, which bears no small proportion with respect to each other. At Hounslow alone, there are at this moment upwards of 1,000 horses employed in stage coaches and posting. On the Paddington Road, a distance of five miles only, there are upwards of 1,000 horses employed at this moment. Throughout Great Britain it is almost impossible to say how many horses are employed, but I should perhaps be within bounds if I were to say millions, in posting and stage coaches. If it is possible to remove those horses by an elementary power (which I firmly believe is practicable), the national advantage must be in proportion to the number of horses so removed; and if it is shown that one carriage horse can be removed from the road by the present state of steam carriages, I see no reason why every horse so employed should not be so removed.

"It has been decided that the consumption of a horse, from the produce of the land, is equal to that necessary for eight individuals, so for every horse that is removed and is supplied by elementary power, we make way for the maintenance of eight individuals. If it is possible, and I see no objection to it, to do the principal work of horses by steam, or other elementary power, the Committee may imagine to what extent we may provide for our increasing population. We may do much by political laws, but natural laws will do more, and when pointed out by the finger of Providence, may be made thus to provide for his wise dispensations.

"I firmly believe that the introduction of steam carriages will do much for this country; I have always had this impression; I left an honourable and lucrative profession, in which I was extensively engaged, in order to attend to this subject, because I was convinced of its importancs and practicability; I have always entertained the same idea as I do at present. Imperfections may exist in the machinery; but I conceive that the main points of difficulty have been removed by the experiments I have made, and that all those now remaining are practical difficulties, which will be removed by further experience; and if there is no cause opposed by the Legislature, or any other source, I will be bold to say, that in five years, steam carriages will be generally employed throughout England. I have not hesitated, having these feelings, to devote all my time for the last six years to the subject, and am mentally recompensed by the present state of the sublect."

These sentiments are, however, but a matter of *individual opinion*, although, I believe, no impartial person can question their truth. The Report of the Committee of the House of Commons expresses the sentiments of a body of men constituting the most able and competent tribunal; and is conclusive, so far as the decision of men can be, whose opinions have been governed by the *best evidence*. The following document, however, is still more important and conclusive, because it states the *results of actual work*; it is therefore *positive*, and admits of no exception.

This, with other valuable documents of a practical nature, was not submitted to the Committee, because immediately after I had given my evidence I left London, and the only subject before them then was that of Tolls. The Committee, in the course of their inquiry, impressed with the importance of the subject, had extended their report to the "probable utility which the public may derive from steam carriages." I had no agent or person to represent my interest in London; and, consequently, when, on this latter inquiry, these documents ought to have been laid before them, there was no one to do so. I have the greater satisfaction now in making them public, because they practically confirm a most important part of their report, and shew the value to be attached to the other views entertained by them.

"The principal document in question, is an exact amount of the time of each journey, during the four months the carriage continued to run between Cheltenham and Gloucester, the number of passengers taken in every journey, the monies received for fares, the monies expended in power, and the wear and tear of the machinery. These heads comprehend all the points which affect comparative value. I am indebted for these particulars to Mr. Stone, who has had the management of the Steam Carriages of Gloucester, and who has superintended most of my experiments from the commencement.

"It is said in the Report of the Committee, that "Mr. James Stone states that the Engine drew five times its own weight nearly, at the rate of from five to six miles per hour, partly up an inclination." As the fact appears only in the minutes of evidence without the particulars, I shall first give here, in Mr. Stone's own words, the particulars of an experiment which I have no doubt is the one, or one similar to that, alluded to. They were written the day of making the experiment.

[*To be continued.*]