Scientific American

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOL. XIII. NEW YORK, MARCH 28, 1858. NO. 29.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At No. 128 Fulton street, (Sun Buildings,) New York,
BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Sampson Low, Son & Co., the American Booksellers, 47 Ludgate Hill, London, Eng., are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.

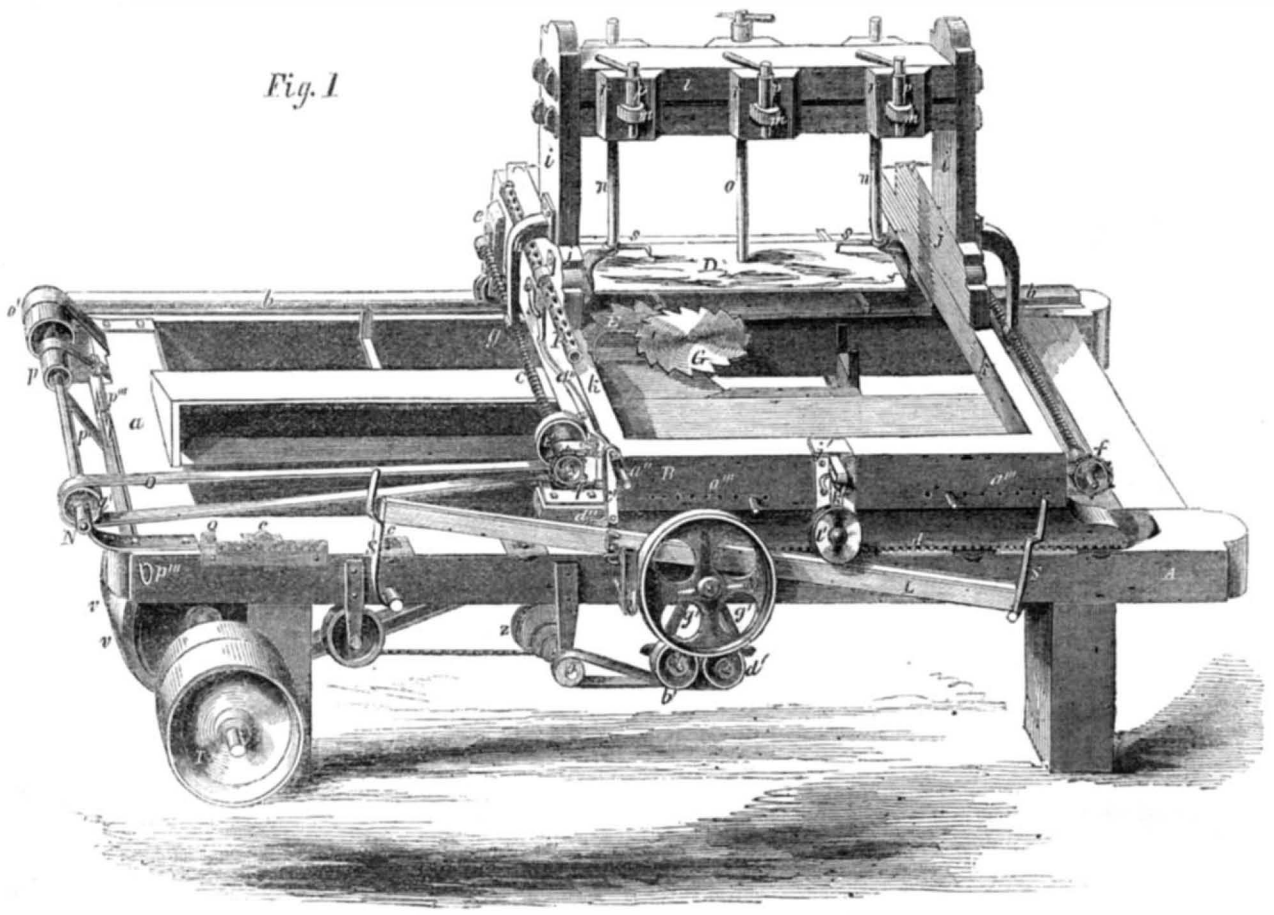
Single copies of the paper are on sale at the office of publication and at all the periodical stores in this city, Brooklyn and Jersey City.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.

☞ See Prospectus on last page. No Traveling Agents employed.

BATCHELDER'S SAWING MACHINE.

Fig. 1



Improved Sawing Machine.

This is a machine for sawing laths, fence pickets and similar stuff direct from the log, and the improvements are such that its feeding and setting motions are perfectly automatic.

In our engravings, Fig. 1 is a perspective view of the machine, Fig. 2 is a plan view, and Fig. 3 will be explained in the course of the description. A is the frame, having crosspieces, *a*, and carrying on one side a V-shaped way, *b*, and on the other a series of rollers, *c*. B is a rectangular carriage placed on the frame and provided with rollers to run on *b*, and a rack, *d*, having a groove in it, runs on the wheels, *c*. At each end of the carriage a screw, C, is placed, fitted into bearings, *e*, and each is provided with a toothed wheel, *e'*, around which there passes an endless chain, *f*, or they may also be connected by miter gear and a shaft. Each of these screws passes through a nut, *g*, formed at the lower ends of curved bars, *h*, which are connected to the uprights, *i i*, placed on horizontal bars, *j*, that can slide freely along the end pieces, *k*, of the carriage, B. The upper ends of *i* are connected by a crosspiece, *l*, which is slotted horizontally and has plates, *m*, placed in it, these plates being also slotted vertically, and having rods, *n n o*, passing through them on one side. Through the opposite ends of *m* pass rods *p*, provided with eccentrics. A block, *r*, is placed on each end of the plates to tighten up against. In Fig. 2 this upper work is removed, as it would obstruct the view of the other parts. By turning the rods, *p*, the upper ends of rods, *n n o*, will be tightly clamped against the crosspiece, *l*. The lower end of the rod, *o*, has a screw on it, which enters into the top surface of the log, D. The lower ends of *n n*, are bent and forked, and they are driven into the ends of the log where they are secured by hooks, *s*, entering into the top of the log. E is a vertical circular saw placed on an arbor parallel to *a*. G is a horizontal saw, also on an arbor, and the edge just touches the plane in which the vertical saw, E, is placed, Both these saws are driven by belts, *v v*. J are small shafts placed underneath A, and driven by a belt from the saw arbor. One of these shafts, J, has a pulley on it, and a belt passes over its outer end, this belt also passing around *b'*, which has its axis attached to a vibrating plate that is pivoted to the side of the machine. A pulley, *d'*, is attached to the opposite end of this plate, the bolt passing underneath it, and rotating it. To the outer sides of these pulleys, pinions, *e' f'*, and to each end of the vibrating plate a bent rod, *g'*, are attached. The upper end of these bars, *g'*, is attached to a bar, L, which is placed loosely on a small shaft projecting from A, and on which it can swing loosely. The pinion of M gears into the rack, *d*. In the side of the carriage, B, which adjoins the bar, L, vertical guides, *j*, are secured (seen in vertical section in Fig. 3) and between these guides a slide, *k'*, is placed, this slide having a roller, *l'*, at its lower end. A pin, *m'*, is also attached to the lower end of *k'*, which fits into a slot in L.

To the upper end of slide, *k'*, is attached a stud, *g''*, which projects out through a spring catch, *k''*, the lower end being attached to slide, *k'*, and is inclined to spring out against a key-pin, *i''*, which works through the outer end of the projecting stud, *g''*. The upper end of the spring catch, *k''*, forms a bow *n''*, projecting out, the inner end is made to catch on a plate, *j''*, when the lever handle of key-pin, *i''*, is turned down; when turned up, it catches on a pawl, *k''*, if the handle of the lever, *a''*, is raised. The lower end of pawl, *k''*, is

Fig. 2

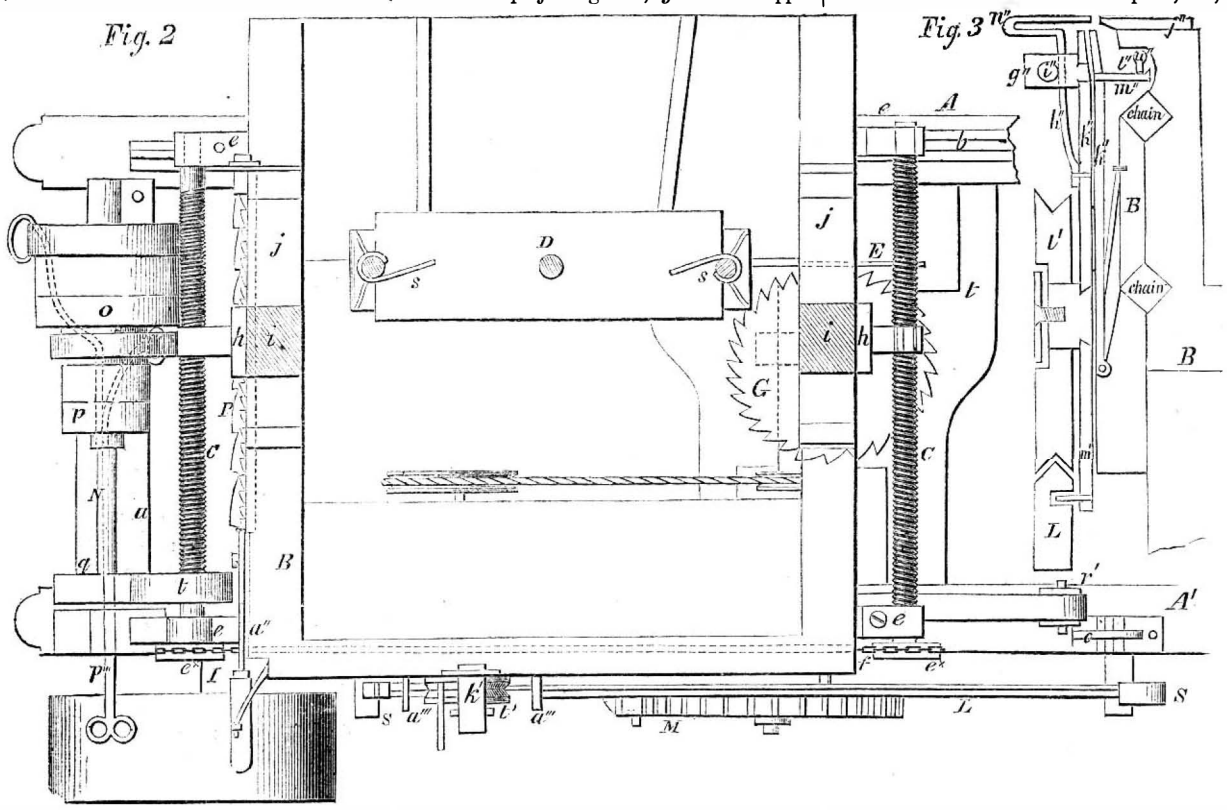


Fig. 3

hinged to carriage, B, the upper end is thrown out by a small spring in the back of it, and is drawn in by a short arm, *l''*, working in a staple or hook, *m''*, attached to pawl, *k''*, said arm, *l''*, is attached to a small rock-shaft, *n*, in the side of carriage, B, which shaft leads to the lever, *a''*, and is connected to it. N is a shaft which is placed at one end of the frame, A. The shaft is driven by belts, *o' p'*, one of which is a cross belt. N has a pulley, *q'*, at one end around which a belt, O, passes, and also round a pulley, *r'*, on the frame and through loops on B, and also under a pulley, *t'*, on one of the screws, C. The outer end of the lever, *a''*, has a pendant bar, *c'*, placed loosely on it, this bar carrying a forked lever, *d''*, pivoted to the carriage, B. The inner end of the lever, *a''*, works under a pawl, placed below a circular rod, P, attached to *j*, and provided with rack teeth different distances apart. To the outer side

of the frame, A, are two plates, Q (one being behind M), provided with a series of teeth. Two spring catches, S, are attached to A, one to meet each end of L.

The operation of the machine is as follows: The log, D, is secured to the lower ends of the rods, *n n o*, and motion is given to the shaft, I. The two saws, E G, are rotated by the belts, *v v*, in opposite directiens, so that the log will not be affected by their motion. The feed is given to the log by the wheels, *b'* and *d'*, moving M, and its pinion operating the rack, *d*. The carriage has a reciprocating motion produced by wheels, *d' b'*, being alternately in contact with M, these wheels being operated by the bar, L, which is moved in its inclination so that *l'* has always to travel up it, and according to the length of the log, pins in holes, *a'''*, push back the springs, S, and throw it in the opposite direction, thus reversing the motion of the carriage. The log is set to the saws, at each movement of the carriage by the screws, C C. This is done by means of the small forked levers, *d''*, which strike against the projections on Q Q, at the end of each stroke. These levers, *d''*, actuate *a''*, and cause the belt O to operate *t'* on one of the screws, C, and the rack, P, is released so that the frame, *i*, can slide the exact width of the lath to be cut. When one row or course of stuff is sawed off the log, D, it is moved to its original position, by shifting the belt, *o'*, by means of the belt shipper, *p'''*, from the idle pulley to the working pulley, the belt, *p'*, by the same movement being also thrown from the idle into the working pulley. It will be seen from the above description that the machine works automatically, the log being fed to the saws in both directions, and also set to the saws at each stroke.

It is the invention of J. H. Bachelder, of Rome, Mich., and was patented by him Sept. 29, 1857. He will be happy to furnish any further particulars.

Preventing Steam Boiler Incrustations.

Although much has been said and written on this subject, it is still a question of much interest. It is taken up by the London *Engineer* of the 12th of February, in which opinions long since put forth by us are enforced. It says:—"We believe that nothing short of an entire revision of the prevalent practice of feeding boilers can be satisfactory. The proper way is to purify the water before it is put in the boiler, not after. That is a full, sufficient and comprehensive solution of theproblem of incrustation and its prevention."

These are sensible words. In our opinion, there is not a railroad, and but very few factories in our country, but could find, at no very great expense, means to supply their engine boilers with soft water. The incrustations in steam boilers are deposits from hard water used in feeding, which leave a coating of stone—sulphate and carbonate of lime—on the inside of the boiler. As this stone coating is a non-conductor of heat, of course, it causes an immense loss, by the excess of fuel required to generate the steam, while at the same time it renders the metal liable to be burned, by keeping the water from direct contact with the iron. Soft water employed for feed entirely prevents the formation of such incrustations, and if possible, no other kind should be used. There are many situations, however, such as in cities and villages, where soft feed water cannot be obtained to supply steam boilers—situations where hard water is the only supply. A simple, cheap, and efficient means of preventing incrustations in such places is a desideratum. In former volumes of the Scientific American, more varied and useful information regarding such means or agencies can be found, we are confident, than in any other periodical or work whatever; but we have been informed that the patent of Robert McCafferty, of Lancaster City, Pa., obtained April 14, 1857, embraces perhaps, the most efficient method of doing this yet discovered. If so—and from its nature, we think it must be good—it should be generally introduced. From his specification we will therefore give a condensed description of the invention:—

The substance employed is black gum catechu, (which is well known to dyers and tanners). Half a pound of this catechu is put into a steam boiler of 100-horse power, in which it is dissolved by the water, to which it imparts a color resembling pale brandy, or a light reddish-brown shade. This is to commence operations. While the boiler is in use during the week, the water is kept as near to this color as possible, by adding small pieces of the catechu.

This is the sum of the invention. Mr. McCafferty discovered that when the water was maintained at the shade described, no incrustations were formed in the steam boiler which had been previously subject to them. And not only did the catechu prevent scale forming in the boiler, when hard water was used, but it removed thick incrustations which had been formed, and converted them into a kind of soft *slush*, which was easily forced out by the blow-off cock.

Catechu dissolves easily in water, and is one of the most powerful astringent gums known. It is a simple and more convenient agent for combining with the lime in the water, and preventing it forming a coat of stone on the boiler, than sawdust, blocks of oak, sal ammoniac, and many other things that have been employed; but whether it is superior to molasses, oil, and tar, which have also been employed, we are not prepared to say. We hope it is, because we welcome every new and useful improvement.

Catechu has been used before for the same purpose, but not by itself, as Mr. McCafferty has employed it. M. Delfour, of Paris, tried it some years since, in combination with various salts, as described on page 40, Vol. VI, Scientific American, and obtained good results therefrom.

In *Newton's London Journal* of last month, (February), there is a description of a composition for removing and preventing incrustations in boilers, for which a patent has been obtained by Henry Hobbs and Edward Easton, of London. It consists of arsenious acid, (white arsenic of commerce), and an alkali—the carbonate of soda (sal soda) being preferred. These are mixed together in equal quantities (by weight) in a vessel, with a small quantity of water—about a gallon to five pounds—and are kept boiling until the arsenic is dissolved; the mixture is then cooled down slowly, and is ready for use. About one gallon per week is sufficient for a 40-horse power boiler; and all that is required, it is stated, to keep the boiler perfectly clean when using it, is to blow-off regularly at the lower cock. This may be a very good composition for the purpose, but it is certainly a dangerous one to use; and great caution and care are necessary, to guard against evil results.

We have received a very original and interesting communication on this subject from Henry Fisher, M. D., of this city, in which he describes experiments made by him with the metal antimony to prevent incrustations in steam boilers. For good reasons we here mention the substance he has successfully experimented with, as we have not been able to find room for his article in this number.

"Will the Atlantic Telegraph Operate?"

Messrs. Editors—The Scientific American of March 13th contains an article under the above caption. I entirely differ with its writer as to the practicability of working three thousand miles of the proposed submarine cable with a battery totally inadequate to fuse the conducting medium, and I base my belief upon actual experiments made, not upon cable in coils, nor submerged; but upon parallel lines of subterranean cable.

Rest assured the enterprising projectors of this immense undertaking have not entered into it without adequate research, and despite of groundless alarms, you and I will probably live to see numerous channels of thought traversing the broad Atlantic. W. H. C.

Morris's Corrections for Local Magnetic Attraction.

[concluded from page 222.]

The report of Capt. Pendergrast and Mr. Dunnington, master of the U. S. steamer *Merrimac*, also settles the fact that the corrections of Morris were perfectly satisfactory during about fifteen months' experience, between the latitutes of 50° and 13° N. The reports say:—

U. S. Steam-frigate Merrimac,
Boston, April 15, 1857.

Sir—I have the honor to enclose herewith the report of Lieut. Dunnington, in regard to the standard-compass of this ship, as corrected for local attraction by Capt. Morris, and I fully concur in opinion with Mr. Dunnington as to the invariable correctness of our compass. As applied to this ship, it has proved all that could be desired, and I have no hesitation in recommending his plan for general use in all our public ships. I am very respectfully your obedient servant,

G. J. Pendergrast, Captain.

U. S. Steam-frigate Merrimac,
Boston, April 14, 1857.

Sir—In obedience to your orders, I herewith enclose a number of azimuths taken for the purpose of testing the standard-compass of this ship, which was corrected by Capt. Morris in January, 1856, for local deviation. The azimuths I have put in the form prescribed by the Bureau of Ordnance and Hydrography. You will see, by the observations, that the standard-compass has invariably given within two degrees the variation as shown by the chart; and this slight difference, I think, is owing to my not always finding a place where the azimuth would give the same heading as the standard-compass.

It is also very difficult to read the headings of the ship by both compasses to a degree, especially the one in the binnacle, when taking observations.

Running from New York to Southampton, we changed the variation gradually from 9° W. to 30° W. The sights taken show that the standard-compass was always correct.

In running from Southampton to Barbadoes, we changed the latitude from 50° N. to 13° N., changing the variation from 30° W. to 1° 30′ E. The observations show the compass to have been correct during the entire run.

As I have always found the standard-compass correct by my observations and the different bearings, I take great pleasure in saying that I am fully convinced that Capt. Morris has succeeded in correcting the standard-compass of this ship for local deviation. Very respectfully your obedient servant,

Jno. W. Dunnington,
Lieutenant, U. S. N.

Great doubt was expressed, even after the experience of the *Merrimac* and the *Mahlon Betts*, as to whether the corrections applied in north latitude would be of any value in the southern hemisphere, and their were many substantial reasons for this doubt in the minds of scientific and practical men. Almost every vessel of iron corrected in England had been obliged to resort to a table of errors, at least, and many of these, in spite of the corrections and the tables, were found to be quite out of the way in moderately high southern latitudes. There is still some reason to doubt the entire success of Capt. Morris's plan, in south latitude, in iron ships, because we have no positive proof of it, but I trust this doubt will be solved when we hear from the *Argentina*. But in steamships of wood the plan has been tried in two or three cases in the other hemisphere. Capt. Dearborn, of the *Yang-Tze* paddle steamer, reports from Bombay that "nothing could work better than my compasses." In this case the error was considerable, on some courses several points before leaving New York.

The corrections were also applied to the U. S. steam-frigate *Minnesota*, Capt. S. F. Dupont, who writes to me from China that his report to the Bureau will be "altogether favorable," and that he fonnd no deviation on getting into south latitude, and that all his landfalls were correct by compass. These are satisfactory evidences of the correctness of Morris's principle, as far as they go, but the *savans* say there is still room for doubt as to whether he has found a way of correcting all cases of deviation arising from local attraction in all places. Let us grant that this is true, and let us solve the doubt, by giving him every steamship and every iron ship in the country, to correct and especially those which are going into south latitude.

The U. S. steam-frigate *Merrimac* has gone to the Pacific and has been heard from as far as Rio Janeiro, but I have seen no official or other report of her compasses since she went into the southern hemisphere. That they will have proved to be correct, like the *Minnesota's*, I have no doubt.

The limits of a letter will scarcely warrant me in going more at length into the importance of correcting all ships for local attraction. It is a subject which merits the serious consideration of shipowners and underwriters, for it is a prolific source of loss of life and property; it should commend itself to the notice of Boards of Trade, Chambers of Commerce, and of Congress, just as much as the lighting of the highways of the sea, just as much as any other means for the security of navigation.

Happening to be on board of an English iron vessel recently, the *Witch of the Seas*, I inquired of the captain if he had any trouble with his compasses? He answered:—"Nothing but trouble; I have had them corrected several times in England, by the most approved methods; they do tolerably well in the Channel, but on going south, they gradually get out, until in high south latitude, I can depend on them no longer. I am obliged to correct them daily by azimuths, and on nearing the land, at the Cape and in Australia, I might as well be without a compass."

It must be remembered that Capt. Morris professes to entirely neutralize the effect of local attraction within a certain distance of the standard compasses; he makes no table of corrections; does not necessarily swing the ship to ascertain the amount and the character of the error; uses no "mass of unmagnetized iron," as recommended by Airy, the Astronomer Royal, and never resorts to placing his compass aloft, excepting in making experiments.

He uses magnets of greater or less intensity, prepared and packed in a peculiar manner. Trusting that these remarks may prove interesting, I leave the subject with the single suggestion that however imperfectly I have treated it in a scientific view, you may depend on my disinterestedness, and my single desire is to do Capt. Morris and navigation a service. R. B. Forbes.

New Ideas.

We frequently receive letters that contain queer suggestions; the writers, being full of comic veins, let off their fund of humor on our editorial heads. As a sample, here are two inventions:—First, a Jersey gentleman thinks (at least he says his wife does, and that's the same thing) that some old bachelor must have invented the "diaper" we noticed a few weeks ago, and that as an improvement his wife has invented a novel piece of apparatus. She proposes to attach an india rubber bag to the feminine shanghai, in which it can deposit its eggs, and thus prevent them from being lost; and as this is a fast age, she would also train them to come to the kitchen door, and announce when they had deposited an ovum. Secondly, a southern correspondent, much deploring the great waste of time and expense consumed in eating, has invented a chewing and stuffing machine, by which all the inconveniencies of the table will be removed, and all that need be done is to place a piece of food in the hopper, turn a handle arranged on the barrel-organ principle, and the food will be masticated, eaten, and digested in a few minutes, to the tune of "Yankee Doodle." After this, who shall say there is no fun in science, and no comicality in invention?

Frost and Thaw.

With the single exception of water, all substances in nature expand or become larger when heated, and contract and become smaller when cooled. A church-steeple is higher in summer than in winter. Metals show this action plainer than other bodies; and, as a consequence, Southwark Bridge, (London,) being constructed entirely of iron, is shorter in cold weather than in warm. If the sun shines but for a few minutes on the great iron tubular bridge, near Bangor, its length is visibly increased. A cannon ball which would pass through a certain ring while cold, would not do so after being placed in boiling water. The tires of wheels, previously to their being fixed, are made hot, in order that, by their contraction when cold, they may bind the work the firmer. The least alteration in the temperature of any material produces a corresponding alteration in the size of it, but no modification in its *weight*. By one of those wise provisions of nature with which the universe may be illustrated, water, as we have just observed, is an exception to this rule of contraction and expansion. From a certain fixed temperature (4·44° C.) it expands either by cooling or heating. The force with which it expands is enormous. It has been calculated that a globe of water, one inch in diameter, expands in freezing with a force superior to the resistance of thirteen and one-half tuns weight. Major Williams attempted to prevent this expansion; but during the operation, an iron plug which stopped the orifice of the bombshell containing the freezing water, and which was more than two pounds in weight, was projected several hundred feet with great velocity.

A simple experiment to illustrate this fact may easily be tried on any frosty day, by filling a common ginger-beer bottle with water, corking it tightly, and afterwards tying it down. If it now be placed in a situation where the water will freeze, the bottle will be sure to be broken. It is from this cause that pipes which supply town houses with water frequently burst, showing the whereabout by leakage directly a thaw begins. This peculiar property of water is taken advantage of in splitting slate. At Colley Western, the slate is dug from the quarries in large blocks; these are placed in an opposite direction to that which they had in the quarry, and the rain is allowed to fall upon them; it soon penetrates their fissures, and the first sharp frost freezes the water, which, expanding with its usual force, splits the slate into thin layers.

With a knowledge of these facts, we can easily understand how it is that a succession of frosts and thaws so completely pulverizes and breaks up the surface soil of the farmer's field. A sharp frost, followed by a rapid thaw, plows a field in a few hours better than hands could do it in ages. In an agricultural point of view, then, the great utility of this crumbling of the soil is obvious; by this means a much larger surface of the earth is exposed to the action of the air than it otherwise would be; and it enables the plants growing upon it to extract those saline materials without which their existence would soon terminate.

Much of the cultivated land was originally produced by the action of frost and thaw upon the rocks which are now below the verdant fields. The lapse of time which it takes to break up a certain portion of rock in this way must of course vary according to the original structure of the stone. Some stone buildings have crumbled to dust within the history of the English nation; while others, erected three thousand years ago, appear the same as ever—such are the Pyramids of Egypt.

The preservation in form and shape in stone that is exposed to the atmosphere, depends entirely on climate, and whether its grain be close or open. If the climate be not subject to variations of extreme heat and cold, the stone will be very lasting if of either nature; but if, on the contrary, the climate exposes the stone to frost and thaw, and the stone is porous, so as to draw in water or rain in contact with it, the destruction of the surface is inevitable; and thus "the palaces of the proud pass away."

Philosophers consider cold, not as an abstract principle, but as an effect produced by the mere absence of heat. Few persons have any idea of the effects produced upon the ordinary substances with which we are surrounded on their being exposed to an extreme degree of cold; many gases which are only known to exist in an aeriform state in our climate, become first liquids, and then solid substances; reminding one of the various states in which water is familiar to us, namely, as a vapor, as a liquid, and as a solid. Mercury or quicksilver is always fluid in our country; but in the Arctic regions, it is frequently solidified, and in this state it can be beaten and rolled out into sheets, like tin or silver. It is certain that were it not for the counter-influence and genial warmth produced by the sun's rays, the whole of our world would become a vast sterile waste, for cold would predominate, and solidify everything therein.

We cannot conclude this cold subject without repeating an anecdote told by Bishop Watson, who relates that "at the whimsical marriage of Prince Gallitzin, in 1739, the Russians applied ice to the same purposes as stone. A house, consisting of two rooms, was built with large blocks of ice; the furniture of the apartments, even the nuptial bed, was made with ice, covered with *sheets* of the same material; and the icy cannon, which were fired in honor of the day, performed their office more than once without bursting." This is also noticed by Cowper:—

"Thou didst hew the floods,
And make thy marble of the glassy wave."

SEPTIMUS PIESSE.

Scientific Burglary.

During the last few months, several of the ordinary iron safes have been burglariously opened in London and Manchester, by means of a powerful instrument employed by the thieves in cutting large holes through the iron doors, whereby they have gained access to the works of the lock. The construction and operation of the instrument were unknown until a few weeks since, when, happily, one of them, with all its loose appliances, was secured by the police. It would be obviously wrong to publish a description of the apparatus; but, having inspected it minutely, and seen it in operation, we are enabled to state that great ingenuity and mechanical skill have been bestowed upon its contrivance. Of course the discovery has rendered a counter improvement in the safe itself absolutely essential to security; and it is with much pleasure that we are in a position to announce the introduction of such an improvement. By the courtesy of the Metropolitan Police authorities, Mr. Chubb, the eminent lock and safe manufacturer, of St. Paul's Churchyard, has been allowed to examine and experiment with the instrument, and he has succeeded completely in providing a simple method of baffling its operation. The improvement consists in placing throughout that portion of the door which is in front of the lock, a number of hardened screwed steel plugs, sufficiently close to each to prevent either an ordinary drill or circular hollow cutter from passing through without encountering several of the plugs. These plugs of hardened steel have the effect of utterly destroying the edge of every description of cutter which can be used with the burglar's apparatus, and consequently render the safes secure from its operation. All Chubb's fire-proof safes and "strong-room" doors are now made with the above improvement, and old safes may readily have it applied. It has been protected by Letters Patent.—*London Mechanics' Magazine.*

Grasshoppers.

A Texan correspondent informs us that the grasshoppers have already made their appearance, and unless they leave before the corn gets up, all Texan breadstuffs are ruined.

Antimony.

Antimony is a brilliant metal, having a bluish tint. It melts somewhere about 800° Fah., and does not contract much in cooling. The discoverer of this metal was Basil Valentine, in 1394. Brittleness is one of its peculiar characteristics, and when broken it exhibits a beautifully crystalline appearance, reflecting the light from myriads of facets, like the jewels in some Eastern palace. In a closed vessel it is slowly but distinctly volatile at a white heat, and can be easily distilled in a current of hydrogen gas. If placed on a piece of ignited coal, and exposed to a stream of oxygen, it burns brilliantly, and forms its oxyd, as a dense yellowish-white smoke, having an odor not unlike garlic. The atmosphere does not sensibly affect it at common temperatures, but when exposed in a fused state, it readily combines with oxygen.

When very highly heated and allowed to fall to the ground from a certain hight, it takes fire and gives off smoke—its oxyd.

Antimony is seldom found in a state of purity in commerce, being contaminated with iron, lead, arsenic, and sulphur in greater or less quantities; but all these may be separated by reducing it to a fine powder, and then fusing it in a crucible, with one-tenth its weight of niter. The fineness of the grain of the ingot is regarded as an indication of its purity. It is discovered as the oxyd and sulphide chiefly in Germany and Sweden. There is some in this country, but we never heard of any antimony veins being worked. It is used chiefly as an alloy, the most important of which is type metal. Britannia metal is an alloy of the same class. In the form of tartarate of antimony and potash, it forms the tartar emetic of medicine; and combined with lead, it forms the plates on which music is engraved.

Interesting Peculiarities of Diamonds.

In Mr. Milburn's valuable work on Oriental Commerce, he gives some very interesting observations on the peculiar characteristics of rough diamonds. According to this writer, the color should be perfectly crystalline, resembling a drop of clear spring water, in the middle of which will be perceived a strong light, playing with a great deal of spirit. If the coat be smooth and bright, with a little tincture of green in it, it is not the worse, and seldom proves bad; but if there is a mixture of yellow with green, it is a soft, greasy stone, and will prove bad. If the stone has a rough coat, so that the eye can hardly penetrate it, and the coat be white, and look as if it were rough by art, and clear of flaws or veins, and no blemish exist in the body of the stone—which may be discovered by holding it against the light—the stone will prove good. If a diamond appears of a greenish bright coat, resembling a piece of green glass, inclining to black, it generally proves hard, and seldom bad; such stones have been known to have been of the first water, and seldom worse than the second; but if any tincture of yellow seems to be mixed with it, it may be regarded as a very poor stone. All stones of a milky cast, whether the coat be bright or dull, if ever so little inclining to a bluish cast, are naturally soft, and in danger of being flawed in the cutting; they will prove dead and milky, and turn to no account. All diamonds of cinnamon color are dubious. A good diamond should never contain small spots of a white or grey color, of a nebulous form. It should also split readily in the direction of the cleavage; it sometimes happens, however, that the folia are curved, as is the case in twin crystals. When this happens, the stone is of inferior value.—*Philadelphia North American.*

Niles' Patent Water Meter.

We learn that Messrs. H. N. Hooper & Co., of Boston, Mass., are now manufacturing some of the above instruments for the Water Board of that city, with a view to their experimental employment for the purpose of determining the practicability of measuring the water delivered to each consumer. Last fall the Board made extended experiments with a large number of different meters, but settled upon Niles' patent as the best of any presented. It is said to be very simple in construction, and very accurate in its results. One of its prominent features consists in the employment of a differential piston which operates the valves.

We have long been of the opinion that the only way to put an end to the present wanton waste of water in our large cities is to charge each consumer a certain tariff for each gallon used. This cannot be done except by the introduction of some instrument like a gas meter, which shall indicate the exact quantity of water drawn off.

Separating and Smut Machine.

This invention combines in the simplest possible manner in one machine, the four well-known functions necessary to effectually clean wheat of all foreign substances, and render it fit for grinding; these are, first, a capability of separating all the lighter and foreign substances by blast; second, separating by screening or sieving those foreign substances whose specific gravity will not allow of their passing off by the action of a proper blast; third, of depriving the grain of all smut which may not have been blown off or separated before arriving at the scouring cylinder, and also scouring and polishing the grain; and fourth, depriving the wheat by a light suction, as fast as it passes from the scouring cylinder, of dust, &c., without lifting and interfering with its discharge. It is the invention of D. M. Donehoo, of Hookstown, Pa., and was patented this week.

Blasting Stumps.

The *Ohio Cultivator* relates the experience of W. A. Gill, of Columbus, Ohio, in clearing a field of stumps by gunpowder, which really appears to be a most powerful "stump extractor." He cleared a stumpy field of twenty acres cheaply and expeditiously, the following plan being pursued for each stump:—

"Select a solid place in a large root, near the ground, and with an inch and a quarter auger, bore in, slanting downward, to as near the heart of the base of the tap-root as you can judge; then put in a charge of one or two ounces of powder, with a safety fuse, and tamp in dry clay or ordinary tamping material, to fill the hole, some six inches above the charge; then touch fire to the fuse, and get out of the way. The blast will usually split the stump into three pieces, and make it hop right out of the ground. If the charge is put in too high up, the blast will only split the top of the stump, without lifting it."

How Corn is Preserved in Russia.

At a late meeting of the Academy of Sciences, held in Paris, a letter from M. de Semchoff—a Russian landholder—was read, describing the manner in which corn pits are made in that country. The pit is dug in a dry soil, and instead of masonry, the sides are hardened by long continued exposure to a wood fire. Before the corn is introduced, the air in the pit is rarified by burning some straw in it, after which the grain is thrown in, packed close, and the pit tightly enclosed. Corn has been preserved in such pits for forty years. Some of our western farmers, who raise large crops of wheat and corn, should try this method of preserving grain during years when there is a great yield, in order to lay up a store for seasons of an inferior yield.

Lowering Boats.

H. de Veuve, of Galveston, Texas, has invented an improved apparatus for lowering and detaching life and other boats. There are three chains attached to the sides and bottom of a boat, and terminating in a piece of iron having a head worked on to it. This head is grasped by a pair of callipers suspended by suitable tackle from the ship. When the weight of the boat is on the callipers, it holds them together, but the moment it touches the water and is fairly afloat, the callipers release themselves, and leave the boat quite free. A patent was obtained this week.

New Inventions.

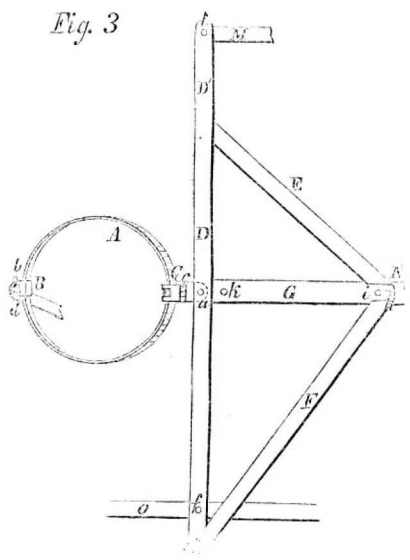
Improved Tailor's Measure.

When it is recollected that the human figure is the very acme of symmetry and grace, it is somewhat astonishing to see so many awkward and ungraceful-looking persons walking our streets, and we are forced into the conclusion that their tailor did not do them justice when he cut their clothes. Too much attention to dress, as a means of adornment, cannot be too highly censured in men, but a slovenly disregard is just as culpable; and as we must wear coats and the like, it is correct and proper that we should have them made a proper fit. "But how can we obtain this desirable end?" exclaim all our readers who wish to be well fitted. As we proceed in our description of the instrument invented by Simeon Corley, of Lexington, S. C., and patented by him December 29, 1857, for the purpose of taking accurate measurements of the body, and of afterwards drafting the garment on cloth, the question will be fully answered.

Figs. 1 and 2 are back and front views of a gentleman getting measured for a new coat, and at the same time showing the application of the instrument, of which Fig. 3 is a view of the principal portions, and Fig. 4 shows the method of drafting from measurements taken by the instrument.

The instrument itself consists of two principal parts, the band, A, of thin steel, or other metal, the object of which is to obtain exactly the measure of the "scye," and apply it to the cloth. This hoop can be contracted or enlarged, and has a set screw, *b*, and slide, B, which secure it at any circumference—the hoop being graduated into inches and fractions. It has also another slide, C, to which a pivot, *a*, is attached by a hinge, *c*; this slide can be moved to any position on the hoop. The slide, B, has a pivot, *d*, rigidly attached to it. The other principal part of the instrument is a triangle, D E F, also of thin steel, or other flexible and strong material, with an extending arm, D′, forming a continuation of D.

Fig. 3



This slide, D and D′, should be long enough to extend from the waist upwards, in front of the shoulder, and over it as far as the middle of the back of any customer. The sides, E and F, form respectively angles of about 50° and 40°. To the angle, E F, G is added, to strengthen the triangle, and also to keep the angle, E F, at the same distance from D, when drawn over the body, as when laid flat upon the cloth. At the bottom of D is a hole, *f*, and a pivot, *g*, and at the junction of E F G is a hole, *h*, and pivot, *i*, at the junction of D G is a hole and pivot, *k*, and at the top of the arm, E, is a hole, *t*. The pivots, *g i k*, project from both sides of the instrument, so that it can be made applicable to either side of the body. M N ● are three straps, each having a stud at one end, to hook into one of the holes, and at some distance from its other end, each is perforated at intervals of about half an inch. These straps serve to attach the instrument to the body. A tape measure having a hole at one end, to hook on to any of the pivots, completes the arrangements.

Before taking a measurement, the hight of the neck seam, at the center of the back, should be marked on the customer, as seen at *o*, (Fig. 2,) and a mark should be made on the back seam, opposite or between the two most prominent points of the blade bones (seen at *m*, Fig. 2), and the natural length of the waist should be marked on the back seam—seen at *n*, Fig. 2. These preparations being made, extend the hoop, A, and slip it over the arm until it encircles the "scye" as close as possible to the body, and then contract it until it fits closely, but comfortably, taking care to bring the pivot, *d*, opposite the middle of the place where what is termed the "back scye" ought to be, then by turning the set screw, *b*, the hoop will be fixed to the right size. Suppose, for example, that the instrument is applied to the right side, as in Fig. 1; place the triangle with its hole near *k*, on the pivot, *a*, of the slide, *c*, and bring the arm, D′, against the collar seam, and draw it up, moving the slide, C, until the side, E, is near the collar seam, in front, and while in that position attach the strap, M, to the hole, *t*, and lead the strap under the left shoulder back to the same place, as seen in Fig. 2. Then turn up the lapel of the coat, and pressing the triangle down flat against the center of the breast, draw the strap, N, under the left arm, and attach it to *d*; then pressing the triangle closely downward and backward, draw the strap, O, tightly round the waist, and attach it to one of its own studs. The instrument being adjusted, take the first measure from *o* to *m*, Fig. 2, the second from *m* to *n*, the third from *n* to the waist, and the fourth from the waist for the length of the skirt. Then attach the tape measure to *d*, and take the fifth measure across to the "back seam;" the sixth to *o*, and the seventh to point *n*. Note the "scye" measure on the hoop, A, and the number of inches from *d* to C, which are the eighth and ninth measures. Next place the tape measure on point, *y*, and take the tenth measure to *d*, the eleventh to *o*, the twelfth to *n*, and the thirteenth to the natural waist. Then move the tape to *k*, and take the fourteenth measure over the right shoulder to *o*, the fifteenth over the same shoulder to *m*, and the sixteenth to *d*; afterwards remove the tape to *i*, and take the seventeenth and eighteenth measures, as seen in Fig. 1. Take the breast and waist measures in the usual way, and the operation is finished. The dotted lines on the arm, E, (Fig. 2,) show the position it should properly take when adjusted.

CORLEY'S INSTRUMENT FOR DRAFTING GARMENTS.

Fig. 1

Fig. 2

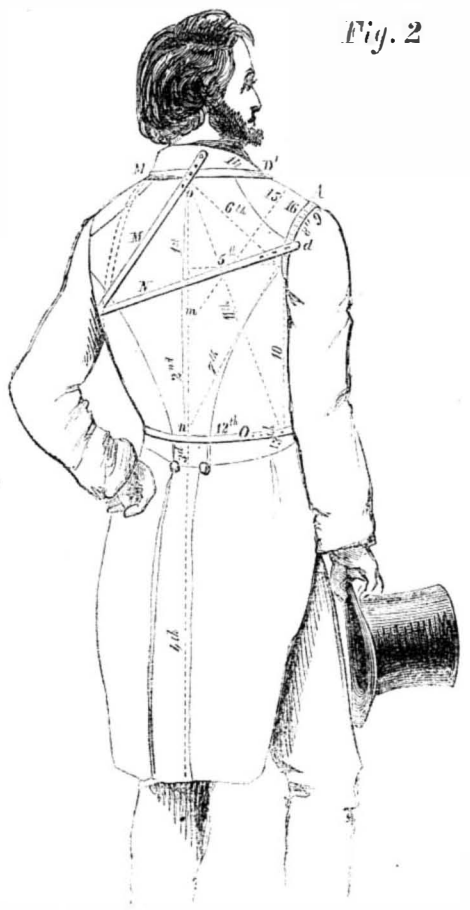
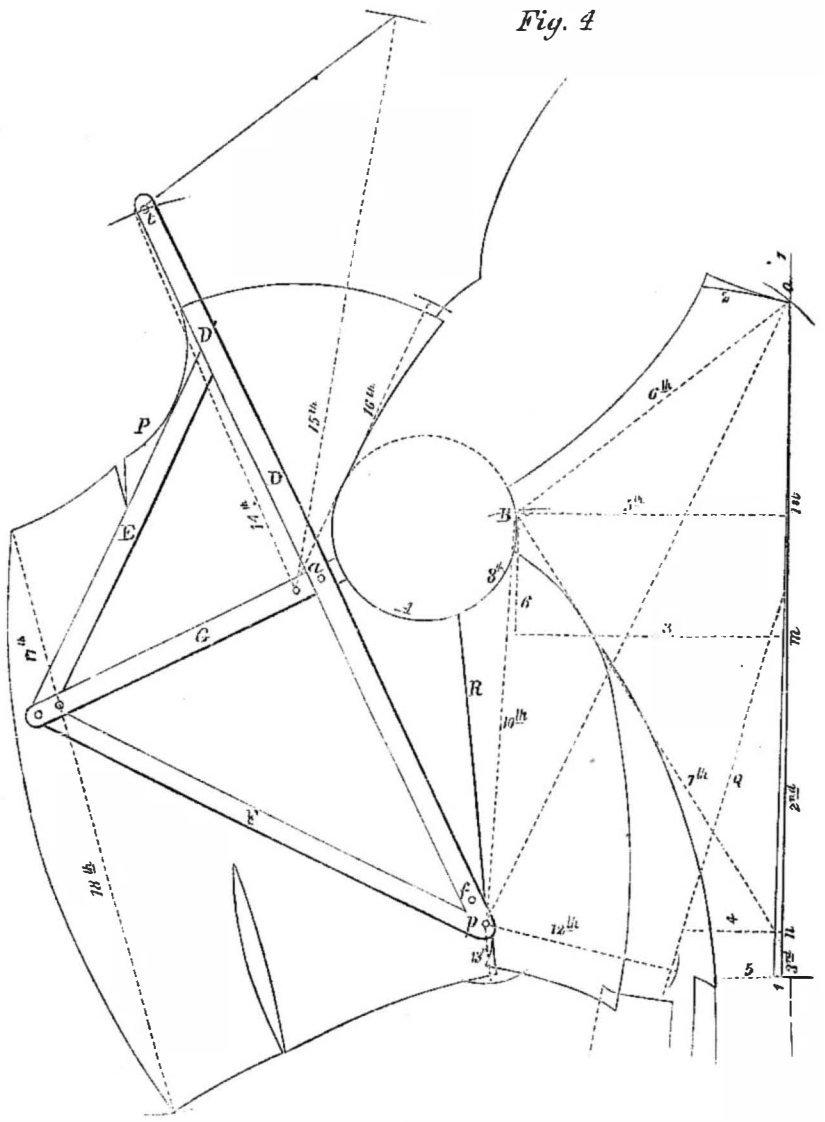


Fig. 4



To draft from the above measurements, draw upon the cloth a straight line, 1, Fig. 4, and a short one, 2, nearly square; mark out on line 1, commencing with its junction with 2, the first, second, third and fourth measurements. Erect at the terminal points of these measures upon line 1, the perpendiculars, 3, 4 and 5, and measure out on line 3, the fifth measure, and square line 6 up to it. Then place the end of the tape at the junction of 1 and 2, which corresponds with *o*, Fig. 2, and take the sixth measure to line 6, from thence take the seventh measure to the waist, and draw the line. Next draw the line from a point in the line 1, opposite the intersection of the fifth and sixth measures on the line 6, to the terminus of the seventh measure, where the natural length of the waist is indicated, and mark out and cut the back to any shape that fancy or fashion may dictate. The outline of the back is shown in Fig. 4 on the right of R by firm black line. Next lay the "indicator," or "form transfer," or instrument, on any part of the cloth from which the front part of the garment can be cut with advantage, and apply the eighth measure, by marking around the inside of the hoop, A, and afterwards apply the tenth measure, to establish the proper position of the triangle relatively to the hoop; then mark around the triangle to fix its position, so that it may not be lost in future markings. Then lay off the eleventh, twelfth, and thirteenth measures, from the pivot, *g*, describing a short arc at the end of each. Afterwards lay off the fourteenth, fifteenth and sixteenth measures, from the pivot, *k*, and the seventeenth and eighteenth from the pivot *i*. Next take the back that has been cut, and place the intersecting lines of the fifth, sixth and seventh measures on the back, to the pivot, *d*, and bring the back in the position relatively to the front in which the measures were taken, that is to say, the top of the back to the arc of the measure 11, and mark the upper part of the side seam on the front from the back. Afterwards place the hand on the line 3, where it crosses at the side seam, and draw the middle of the back at the waist up to the arc described by the twelfth measure, and then form the remainder of the side seam from the back. Now remove the back, and place it as represented, in the upper part of Fig. 4, bringing the point, *o*, to the arc described by the fourteenth measurements, and the terminal point of the fifth and sixth measurements to the arc described by the eleventh measurement, and the point, *m*, to the arc described by the fifteenth measurement, letting the top of the back or neck rest on the line indicated by the edge of the arm, D′, of the instrument. While the back is in position mark from it the

shoulder seam, the neck gorge, and the "scye." Then apply the nineteenth measure to mark the throttle, and the breast and waist measures, adding to the breast any surplus for lapel as fashion may demand. From the bottom of the fore part to the measures thirteen and eighteen, give the spring to the seam under the arm, as the measure thirteen may indicate.

The advantages obtained by the use of this instrument may be set forth as follows:—First, Getting the exact size of the "scye" at the right place, by keeping the hoop, A, close against the body during the time of taking the measurement. Second, By placing the arm, D, of the triangle against the neck seam, and drawing all sides of the triangle closely against the breast, as described, a base line is unerringly established from neck to waist, thus bringing the pivot, *g*, at the waist backward or forward on the side of the customer, as his shape may need—the measures from the pivot, *g*, establishing correctly the relative positions of all the other points of the garment. Third, The relative positions of all points in coat-drafting are established, and every part of the garment is enabled to be delineated accurately in its relation to every other part, without which no garment can fit. For tailors it is a valuable addition to their usual tools of trade.

For further information address the inventor as before stated.

Scientific American.

NEW YORK, MARCH 27, 1858.

Legislation upon the Patent Laws.

The constitution of the United States confers upon Congress the power to promote the progress of science and the useful arts by securing to inventors the exclusive right to their discoveries for a limited time, and to make all necessary laws for carrying into execution such power. The first act having this object in view was passed on the 10th of April, 1790. Under this act, the fee required for receiving and filing a petition for a patent was only *fifty cents!* Two dollars were required for making out the patent, and an extra charge of one dollar was made for affixing the great seal. We suppose this great seal bore some resemblance to the mammoth turnip-like appendage which the British government is wont to attach to similar documents at the present day. Subsequent to this act, the power of Congress was invoked to amend it by the passage of bills during the years 1793 and 1794; also in 1800, 1819, and 1832. With the progress of the country, and the necessary demand for increased facilities to meet the wants of commerce, agriculture, and the industrial arts generally, it became evident that a more comprehensive and better system of protection was required to guard the rights of that class who alone could furnish the means necessary to develop those great interests. The next attempt at legislation on this subject was made during the years 1836-7, under the administration of President Jackson. Hitherto the system was almost "without form and void." The power to grant or refuse a patent was delegated to the Secretaries of State and War, and to the Attorney General. No examination was made into questions of novelty; it was left discretionary with those functionaries to grant a patent or not, according to their own notions of utility in the invention presented to them. This relic of a barbarous age is still continued in some European countries, and finds a warm defender in M. Jobard, of Belgium—an able writer, and one whose knowledge upon this subject could be worthily employed in breaking it down, instead of defending it against a successful experience of twenty years under an opposite system in this country. The acts of 1836-37 were steps in the right direction. Previous to this time there were few applications for patents, and there was no security even in the issue of a patent, owing to the want of revision by men of artistic knowledge and experience. No one feared to infringe a patent, and the reputation of this species of property was so bad that it was with great difficulty that patentees could induce capitalists to aid them in bringing out their improvements.

The statute of 1836 changed the whole aspect of this matter. Confidence was inspired, and a stimulus was given to men of true genius who had hitherto kept out of a field mainly occupied by pretenders. The history of the progress of invention and discovery in our country is in a general way familiar to all intelligent readers; and if those who seem to delight to scoff at the sons of genius, because they sometimes exhibit an undue zeal for some *ignis fatuus*, will but reflect a moment, they will at once see that, without this useful class of patient thinkers, the world would be trudging along at a snail pace. The acts of 1836-7, considered as a whole, constitute a patent system the most perfect ever devised by the wit of man. It has not only wrought wonderful things for our country, but it has also thrown the shield of its protection over the rights of the inventor, and thus interposing, it guards both interests with judicious care. It is due to the memory of Hon. John Ruggles, then United States Senator from Maine, to acknowledge his indefatigable exertions in this matter. He devoted himself to this subject with equal zeal and success, from the inception of the bill to its final signature by the President, and at a time when his term of office was about to expire. Like all other works of human wisdom, however, time and experience have traced upon it certain slight imperfections, and it is necessary that Congress should know what they are, in order to legislate upon them in a proper manner.

The history of every attempt at patent law legislation, since the passage of the amendment of 1842, has resulted in failure. It is true many attempts at reforms have been made; conventions pretending to represent inventors have been held, but were composed generally of speculators and schemers; lawyers skilled in all the intricacies of their profession have have been consulted, and of course could stop short of nothing but a "new code," more complicated with details than the first. The press has fulminated its views upon this subject with a zeal sometimes not according to knowledge. Senators and Representatives have from time to time peered into these mysterious statutes, seeming to wonder what all this rigmarole is about; and if they have not confessed it, their action has usually indicated either a profound ignorance or a stolid indifference to the whole subject. Senator James, of Rhode Island, tried his hand at this business while he was in the Senate, and made a sad blunder. Mr. Taylor has during this session unwittingly adopted a bill which, we doubt not, he is now ashamed of; and so the matter has gone on with all the irregularity of a disordered clock until now.

A very sensible movement was made during the last Congress, by the House Committee on Patents, to amend the laws; a bill was reported, printed, and—neglected. There was no one to engineer it through, as no one in particular was likely to be benefited by its passage. If it had only contained a clause which could be tortured into a revival of some dead patents, the bill would have had friends among the gang of lobbyists who seem to hover about the Capitol, watching their own interests like crows over a dead carcass.

The bill reported by Senator Evans, as published in the last number of the SCIENTIFIC AMERICAN, is altogether the most sensible movement at reform in the patent law that has been attempted for many years. It wisely ignores the lobby gang, and confines itself to a few simple changes in the present admirable system, without undertaking to tear down and build anew.

We will briefly sum up the disabilities which are designed to be removed by this bill. It confers upon the Commissioner the power to compel the attendance of witnesses in contested cases pending before the Patent Office. At present the Commissioner has no power whatever in such cases; and it is oftentimes exceedingly difficult to adjudicate upon them, for the want of such testimony as he cannot secure, unless he is willing to pay *experts*, which, of course, he will not do. The cause of justice and truth can oftentimes be maintained by the proper exercise of the power proposed to be conferred on the Commissioner by this bill. It is unnecessary for us to argue in favor of the establishment of an Appeal Board to hear and decide upon rejected cases. We have already fully exhibited its great importance, in previous articles. It is working now most admirably, and should become an established branch of the Patent Office. If this Appeal Board does not do justice to the applicant, he can appeal his case to the Commissioner upon the payment of a moderate fee, instead of being compelled to take it to an outside tribunal. The bill dispenses with models of designs, and authorizes the Commissioner to restore to applicants or otherwise dispose of all models of rejected cases. The utility of this provision of the bill must be apparent to all. A very large space in the Patent Office is given up as a sort of receiving tomb for this class of models; they are in a state of wretched disorder—covered with dust and rust. Many of them cost much money to the applicants who would gladly receive them back, and they are certainly of no use to the Patent Office, as the drawings and specifications are retained for referenee.

This bill, should it become a law, will wipe from our statute-book an ugly blot which has disgraced it for many years past. We refer to that feature which specifies that a British subject shall pay $500 on making his application for a patent, and all other foreigners shall pay $300. We can scarcely call to our aid language sufficiently strong to express our abhorrence of this contemptible discrimination. The English press has spoken against it with great justice, and we confess to a sense of humiliation when we look this matter full in its face. We are glad this bill proposes to abolish the needless and indecent distinction, and thus invite upon one common platform the sons of genius from every quarter of the globe.

The present system of allowing two-thirds of the patent fee to be withdrawn in cases of rejection is undoubtedly a bad one. There are claims of this character resting against the Patent Office running over a space of twenty years; they are liable to be presented at any time; and are sufficient in amount to bankrupt the Office. We are confident that we but speak the sentiment of every reflecting inventor, when we say that this system should be abolished without delay. The schedule of fees is, on the whole, very satisfactory. We think, however, that a fee of *ten* instead of twenty dollars would be sufficient to require from an applicant on an appeal to the Commissioner of Patents; and that ten cents per hundred words is quite sufficient for certified copies of papers deposited in the Office. We hope the committees will make these changes; or else the above tax is likely to bear very heavily upon a few, particularly that clause in regard to certified copies.

We have now presented a brief and necessarily imperfect view of the history of patent law legislation in this country, together with a synopsis of the bill now before Congress. It is an important subject; one which ought to receive earnest attention. This bill is the best amendment which has been reported since 1837, and deserves to be incorporated into the statute-book without delay. Will it be done? We have strong fears on this point. The committee are cautious and need to receive strong assurances that there is no snake in the grass; and we call upon inventors throughout the country to write at once to their Congressional Representatives, urging upon them the importance of the bill. Members of Congress are strangely indifferent to this whole subject; political questions absorb their attention; and thus inventors are forgotten. Opposition to the passage of this bill it is expected will be made by those whose selfish schemes have been frustrated, and who would like to saddle down inventors by a complicated system which would destroy their future prospects. Inventors will you remain unconcerned in this matter? or will you do something to aid the passage of this simple bill as reported by Senator Evans?

The Polypi.

These are a division of the animal kingdom one step higher in their organization than the infusoria, of which we gave a short account some time ago. They were first observed by M. Leeuwenhoeck, of London, in 1703, in some fresh water; but since that time we have become aware of their existence in water of all kinds, fresh and salt. The name of "polypi" is derived from two Greek words, signifying many feet, as all of them have a number of long arms or feet (it is scarcely proper to call them either) placed around their mouth, which is in the center of their bodies. Indeed, if you take an india rubber bag, and place a number of strings around its mouth, you have a very good typical polyp.

The polypi are not all microscopic, but some attain the size of the cuttle-fish, from which we obtain the beautiful color *sepia*. This is a dark liquid secreted by the animal, which cannot move very fast; so when a large fish casts his greedy eye upon him, the cuttle-fish squirts out this sepia, and makes a watery cloud so thick around him that the enemy is quite be-fogged, and is glad to escape from so dense a mist, instead of having the meal he expected. The actinia are members of this division—the beauteous sea anemones; they fasten themselves to a stone or rock, and spreading out their colored tentacles or arms, wave them gracefully beneath the waves. The eye is never tired of gazing on their elegant motions and gorgeous hues; they are the most lovely flowers in old Ocean's garden. These are soft-bodied polypi, having no skeleton; but there are some which make for themselves outside coats of carbonate of lime. Not only do myriads live together in a single concrete house, but so numerous are they that they form islands so large that men can live on them, and animals roam in woods growing on land raised from the sea by a little thing not much larger than a pin's head; these are the corals, whose history is always interesting, and the story of whose life is the romance of aqueous creation.

The most extraordinary of all the polyps' peculiarities is the fact that some of them can be cut up into little bits, and each piece will instantly begin life on its own account, as a new and perfect polyp. They increase by *gemmination*, or the young ones grow like branches from the parent stem, and when they are old enough, disconnect themselves and float away. These arms, with which they are all provided, are their means of offense and defense, and with them they also collect their food, by forcing a current of water down the central aperture of their bodies, or mouth. Some can dilate their mouths to an enormous width, and the sense of touch is very finely developed in them. Some naturalists have thought they have seen traces of a rudimentary eye.

The anatomy and life of polyps is a most interesting study, and is calculated in the highest degree to call forth human admiration at the skill and order of their construction and habits. The study of life is always gratifying to living beings, and never more so than when observed in these, the lowest forms.

Chalk for Warts.

A correspondent—W. H. Bennett, of Warwick, R. I.,—informs us that by rubbing chalk frequently on warts, they will disappear. In several instances known to him in which this simple remedy was tried, it proved successful. We have known slightly moistened pearl-ash to remove warts by rubbing it upon them.

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 16, 1858.

[*Reported officially for the Scientific American.*]

MODE OF OPERATING VALVES IN STEAM ENGINES—Thomas S. Jamieson, of Alexandria, Va. : I claim in combination with the sliding bar, G, and its several appliances, as described, operated directly from the engine, the swinging dogs, H H, which are moved and adjusted by the governor, substantially as described, and for the purpose of tripping the valves at any desired stroke of the engine.

HOLDER FOR PLANING KNIVES WHILE GRINDING—Lyman Jennings, of Erving, Mass. : I claim the frame, A, provided with the rollers, E E, one or more, and the plate, C, clamps, h h, and adjusting screws, m m, or their equivalents, for securing and adjusting the knife or cutter, D, in the frame, substantially as and for the purpose set forth.

[There is a clamp secured in a frame provided with rollers, one or more, and with handles, so that the cutter or tool to be ground may be firmly secured in the clamp, and by applying the frame to the stone, the tools are ground in a perfect manner. This invention is more particularly designed for holding knives or cutters, that in order to cut perfectly must have their cutting edges perfectly level, and at a certain angle.]

APPARATUS FOR REGULATING AND MEASURING THE INTENSITY OF ELECTRIC CURRENTS—Joseph Lacussagne and Rodolphe Thiers, of Lyons, France : We claim combining the application of the three principles specified, so as to form an apparatus for regulating and measuring the force or intensity of the electric current produced by any battery, and applicable to telegraphing and motive purposes, substantially as set forth.

GRAIN CRADLES—John Leidy, of Lamar, Pa. : I claim the arrangement of plate, A, and its shank, D, with rods, B, and screws, C, in the manner and for the purpose set forth.

SAWING MACHINE—H. H. Low, of Galena, Ill. : I do not claim, separately, any of the parts described.

But I claim the vertically sliding and balanced bolt gate, G, and saw, D, in combination with the feeding device formed of the bar, K, levers, L, pawls, M, and racks, J, the whole being arranged to operate conjointly, as and for the purpose set forth.

[This is a machine for sawing shingles, barrel-head stuff, and similar substances, and the improvement consists in the employment of a vertical sliding and balanced bolt-frame, and a circular saw, arranged so that the bolt may be adjusted and fed to the saw with great facility. There is also a peculiar device for adjusting the bolt, so that it may be placed in a proper relative position with the saw each time previous to being fed towards it, and the articles can be cut from the bolt with either taper or parallel sides, as desired.]

PICTURETYPES—John McElheran, of Brooklyn, N. Y.: I claim the mode described of preparing the picture-types to be printed from granulated surfaces, producing various shades and effects, for the purposes specified.

DOOR REGISTER—John W. Miller, of Swanton, Md.: I do not claim the employment of the spools, or the rollers, or the canvas for this purpose, as these have been used before.

But I claim the peculiar arrangement of the spools, A A′, and shafts, B B′, with the rollers, C C, and canvas, D D′, substantially as set forth, and these in combination with the face of stationary inscriptions and the slate, as fully described.

SPINNING BOBBINS—Alfred E. Nichols, of Lowell, Mass. : I claim a slotted bobbin, having a spring ring, or its equivalent, so applied to it as to impart increased adherence of the slotted portion of the spindle on which it is placed, essentially in the manner and for the purposes fully set forth and described.

MILKING PAIL—Solomon Oppenheimer, of Peru, Ind.: I am aware that plugs or valves are pressed against the orifices of vessels for holding liquids, and the same kept closed, through the instrumentality of springs, and such has been described in the English Patent Journal, Vol. VII., page 146, by Theo. de Mevillac on his oil can; also a similar device has been patented to George Trott on his lubricating cup, in 1856. I therefore disclaim any such devices.

But I claim the pendant rod and lever bar, when combined, and for the purpose of keeping the orifice in the milking pail open, when the same stands uninterrupted, and in its proper position; anything else I hereby disclaim.

SPRING BEDSTEAD—Nathan M. Phillips, of New York City: I claim the combination of the cross bars, C C, and the spiral springs, E, with the bottom bars, F, and flexible connections, F′, connected, arranged and operated as and for the purposes set forth.

COOKING STOVES—Christian Raub, of Davenport, Iowa: I would state that Letters Patent were granted to me on the 20th of October, 1857, on a stove, in which I have claimed the combination of the feeding stack with the spreading cone, and the simultaneously-acting dampers. I therefore do not lay claim to these, here.

But I claim the arrangement described of the series of stoves, fed by one central stack, and provided with one central smoke-stack and a central water boiler, substantially in the manner and for the purpose set forth.

COOKING STOVES—Christian Raub, of Davenport, Iowa: I claim the arrangement of the feeding trunk and its water chambers, in combination with the fire chamber, ovens, and flues, for the escape of the gases of combustion, substantially in the manner and for the purpose set forth.

GANG PLOWS—Lewis Roach, of Covington, Ky. : I claim the described arrangement of spiral splines, G, (to which the plows are attached,) and adjustable arms, F f, in combination with the gravitating shaft, E, and the gage wheels, L.

WASHING MACHINE—James Robb, of Lewistown, Pa.: I do not claim, broadly considered, the employment of a flexible base on which to wash clothes.

But I claim the combination of the open frame, a b c, with the movable flexible casing, R or R′, constructed and operating substantially as and for the purpose set forth.

PORTABLE GAS RETORTS—John W. Smith, of Washington, D. C.; I do not claim any apparatus which admits of the passage of gas between heated surfaces, when the passages are only opened at intervals by the pressure of gas or steam, as such has been before described.

But I claim the combination of the horizontal retort, B, with the casing, C, when the former is constructed with an open end, and so arranged in reference to the latter that a space shall be constantly left open for the passage of the gas between the retort and the casing, in the manner described and for the purpose specified.

MACHINES FOR TRIMMING BOOKS—Amzi C. Semple, of New York City: I claim bringing the table or carriage which contains the books or paper to be cut to the knife, by moving it up an inclined plane by means substantially such as described.

CANAL BOAT PROPELLER—George W. Swartz, of Buffalo, N. Y. : I do not claim a propeller guard, broadly considered.

But I claim the guard, A, when arranged with a recess or chute, D D, &c., for the purposes and substantially as set forth.

I also claim the braces, I, for the purposes of strengthening the guard and supporting the propeller shaft, substantially as described.

PREPARING SILK FOR USE WITH FELTING SUBSTANCES—Anson Taylor, of Brooklyn, N. Y. : I do not claim the use of steam, or a moderate degree of heat, in the operation of preparing fibrous materials for carding, the same operation simply to soften the fibers temporarily.

But I claim the method described of preparing silk fibers for use with fur, or other felting materials, substantially as and for the purposes specified.

PLOWS—Grey Utley, of Louisburgh, N. C. : I claim the combination of the vertically adjustable mold-board, M, with the sub-soil point, and the two land sides, L L′, substantially as and for the purpose set forth.

ANCHOR—William Williams, of St. Louis, Mo. : I claim the application of the separate block, D, to the lower end of the anchor shank, and of hinging the flukes in the said block, substantially in the manner described, for the purpose specified.

SEWING MACHINES—Joseph E. Hendrick, (assignor to himself and William Holmes,) of Brooklyn, N. Y. : I claim, first, A concentric rotary feeding pad, vibrating upon an axis which yields to pressure in an upward direction, giving a pressure upon the cloth, which is entirely subject to the tension of the spring, or other device, by which the pad is forced down upon it, without being subjected to the action of a toggle-joint, as set forth.

Second, The combination of an adjustable spring friction brake with a rotary thread carrier, consisting of the shaft, o, disk, P, and points or pins, n n, or their equivalents, as set forth.

METALLIC SASH—Charles Hartwell, of Boston, Mass., assignor to Lewis L. Bartlett, of Brooklyn, N. Y. : I claim the construction and use of metallic sashes, composed of two parts, C D, in the form substantially as above described, so that one or both the parts may yield, by its elasticity, in combination with an elastic bedding, F F, substantially as above described, for the purposes set forth.

I also claim making the inner portion, C, of the above described metallic sash, with a groove, I, substantially as described, and for the purposes set forth.

SEWING MACHINES—Sidney Parker, (assignor to himself, Leonard Westbrook and Hugh Herringshaw,) of New York City: I do not claim, generally, the communicating of a reciprocal motion to the needle stock, for the purpose of sewing by machinery.

Nor do I make claim to the use of a stationary bobbin resting in a loose socket, over which the loop of the upper thread may be carried, to form a stitch, without a shuttle.

But I claim the combination and arrangement of the horizontally reciprocating pronged looper, m n, and the bobbin, when constructed and operating in the manner substantially as described.

DUMPING BOXES FOR AGRICULTURAL PURPOSES—John Van Doren, of Farm Ridge, Ill., assignor to himself and B. Murray, of Ottowa, Ill. : I wish it to be understood that I do not confine myself to the form thereof, nor to the precise manner of operating the same.

But I claim the right of varying their form and operation, in any manner substantially the same within the limits of the nature of the invention.

I claim the combination of the dumping boxes, constructed as described, with the blocks, N, and platform, M, for the purposes set forth.

LET-OFF MOTION FOR POWER LOOMS—Newell Wyllys, of South Glastenbury, Conn., assignor to himself and Charles Collins, of Hartford, Conn. : I claim, first, The employment of a movable cap, C, or its equivalent, as the bearing surface for the cloth on the breast beam of the loom, for the purpose of controlling the letting-off the warp yarn from the yarn beam, by the pressure of the cloth on the breast beam, substantially as described.

Second, In combination with the movable cap, C, of the breast beam, or its equivalent, and a friction wheel and friction band applied to the yarn beam, I claim the train of mechanism described, through which the said movable cap or its equivalent, is operated to control the tension of the friction band, for the purpose of controlling the tension of the warp yarn.

[This is an arrangement of certain mechanism whereby the letting-off of the warp yarn from the yarn beam is properly controlled by the pressure of the cloth upon the breast beam of the loom.]

SEWING MACHINES—Joshua Gray, (assignor to himself and T. B. Mackay,) of Boston, Mass. : I am aware that the angularly slotted plate has been employed in combination with other devices in the patent of Daniel Harris, for operating the feed in sewing machines. I therefore do not claim this device. My method avoids the necessity of using any intermediate device to operate the feeding foot.

But I claim, first, The arrangement of the adjustable slotted plate, H, in the manner described, and for the purposes specified.

Second, The arrangement and combination of the double cam block, M, with the looper, L, substantially as described and for the purpose specified.

ARRANGEMENT OF DEVICES FOR LOWERING AND DETACHING BOATS—Henry De Veuve, of Galveston, Tex.: I claim the peculiar arrangement, consisting of the chains or braces, B B B, central broad-headed bolt, C, and grapple hook, D, with the lowering tackle of a ship, substantially as and for the purposes set forth.

LATCH FOR DOORS—Thomas C. Ball, of Keene, N. H. : I claim the combination of the latch, A, the handle, D, the lever, E, the spring, B, the lock seat, f, or their equivalents, for the purposes stated and fully described.

GRAIN WINNOWERS—H. H. Beach, of Philadelphia, Pa. : I claim, first, The bottom delivery board, F, having one or more series of fingers at its lower end, when the same is vibrated in a vertical direction, the blast of air from the fan acting upon the fingers in the manner described and for the purposes set forth.

Second, The combination of the series of inclined planes, S S′, with the shoe, O, and fingers, M M′, when arranged in relation to each other, and to the cover, B, and partition, C, as described, for the purpose of deflecting the blast of air from the fan, and directing it through the riddle and through the fingers, as set forth.

VENTILATING HATS—James W. Beebe, of New York City : I do not wish to be understood as making claim, broadly, to the use of a sweat-leather, separated from the hat by an open space, for the circulation of air; nor to the use of a perforated flanch, for the admission of air to the space between the hat and the inner lining.

But I claim making the sweat of leather, or any of the equivalent substances usually employed for hat sweats, with a flanch pierced with numerous small holes, combined with, and attached to, the brim of the hat, substantially as described, so as to leave open space for the free circulation of air between the sweat and the hat.

MACHINE FOR PLANING BLIND SLATS—Charles Carlisle and Leonard Worcester, of Woodstock, Vt. : We disclaim all old devices and combinations described in the foregoing specification.

But we claim the arrangement of the several separate devices as shown and described, and for the purposes set forth.

SEED DRILLS—C. B. Brown, of Alton, Ill. : I claim, first, The employment of vertical, vibrating, serrated blades, G, in combination with the slitted flange, or serrated drill teeth, F, substantially as and for the purposes set forth.

Second, The combination of the seed-distributor, O, and clearing blades, G, and propelling axle, C, by means of a double-acting rock shaft, I, three connecting rods, H J j, two elbow levers, c i, a crank shaft, K, and transverse slide, P, and two spur wheels, L M, substantially as and for the purposes set forth.

LIFE-PRESERVING BUOY—Benjamin Burling, of Buffalo, N. Y. : I claim the general arrangement of parts and conveniences constituting a life and treasure preserving buoy, substantially as described.

JOINERS' BEVELING PLANE—Thomas A. Chandler, of Rockport, Ill.: I claim making one or both plane stocks adjustable on the arms or shanks of the hinges, so as to plane bevels of the same angle on boards of various thicknesses, substantially as described.

STEAM BOILERS—Abner Clark, of Fort Des Moines, Iowa : I do not claim, broadly, the employment of a series of pipes for heating the water and collecting the steam.

Nor do I claim, broadly, the heating of the feed water by the escaping products of combustion; but the special arrangement of parts shown and described I believe to be new.

I claim a steam boiler, having its walls, A B, tubular water and steam spaces, C C D D, the cylindrical steam chamber, I, tubes, E H, connecting elbows, F G, and feed water pipes and boxes, all arranged and combined as shewn and described, for the purposes specified.

[This invention consists in a certain arrangement of tubular water and steam spaces, water walls, and connections in a steam boiler, to obtain a very extensive heating surface, and economize the fuel, and at the same time ensure a perfect circulation of the water.]

VISE—Charles B. Clark of Oriskany Falls, N. Y. : I do not claim, broadly, a jaw arranged so that it may adjust itself parallel with one side of the taper articles to be grasped, without reference to the particular means employed for effecting the purpose, for jaws have been previously arranged to effect this purpose.

Neither do I claim, broadly, the construction of the screw rod, D, irrespective of the pawl, E, and the particular adaptation of said parts, as shown and described.

But I claim, first, The arrangement and combination of the bar, B, screw rod, D, (having a thread, c, of the peculiar form shown,) and pawl, E, the latter serving the double purpose of a pawl and nut, substantially as and for the purposes described.

Second, Providing the bar, B, with recesses, e e, so that the jaw, F, may adjust itself or turn upon its pivot, d, substantially as and for the purposes set forth.

[This invention consists in the employment of a peculiarly constructed screw and pawl, arranged and applied to the vise, whereby the movable jaw is rendered susceptible of being quickly and also firmly adjusted to the stuff to be held or clamped. There is also a peculiar arrangement of the movable jaw, whereby irregular shaped articles, or articles of taper form can be held or grasped by the jaws as firmly as if they were plane.]

CALENDER ROLLS—Gardner G. Clark, of Providence R. I. : I claim as a new article of manufacture a calender roll with its working surface formed of animal hair, in the manner and for the purpose specified.

MOUNTING FLUID LENSES—Almira M. Cole, of Windham, Me. : I claim the appendage to the shade of a fluid lens, a woman's sewing utensils, as described.

MANUFACTURE OF TEXTILE HOSE—L. B. Cooley and J. C. Cooke, of Middletown, Conn. : We claim the double tube or hose as a new article of manufacture, woven in the manner and for the purpose specified.

PHOTO-LITHOGRAPHY—J. A. Cutting and L. H. Bradford, of Boston, Mass. : We claim the employment of gum arabic deprived of its power of intimate union with the stone by means of sugar, or its equivalent, as set forth.

And in combination with the above we claim the use of soap, as set forth, for the purpose of readily removing the unlighted portions of gum, and of forming the printing surface, as described.

ROOFING CEMENT—William T. De Golyer, of Schenectady, N. Y. : I am aware that it is not new to saturate canvas with tar and earthy matter to form a chemical roofing thereby.

Nor is it a new thing to mix iron filings or turnings with salt and water, or lime and water and salt, to make a cement to unite iron pipes, or even to form a chemical roofing, when such roofing contains no elastic basis to prevent cracking. I disclaim, therefore, all these devices.

But I claim combining an elastic basis, consisting of tar, canvas and earthy matter, as set forth, with a superimposed coat of iron turnings filled in with earthy matter, in the manner and for the purpose set forth.

LOCK—William Denney, of Philadelphia, Pa. : I wish it to be distinctly understood that I do not desire to confine myself to the shape of the tumblers in every minutia, nor to any particular number of the same.

I also do not claim the use of the detector, P, exclusively, as similar contrivances have been made use of before.

But I claim, first, The employment of the lever, I, in combination with the tumblers, the whole being constructed and operating substantially as set forth.

Second, The combination of the detector, P, with one of the tumblers, in the manner shown.

Third, The described employment of the supplementary key, for the purpose of releasing the bolt plate from the detector.

SEPARATOR AND SMUT MACHINE—Daniel M. Donehoo, of Hookstown, Pa. : I claim, first, The arrangement of a horizontal flaring blast spout, F, with a vertical spout, G, furnished with sliding adjustable screening gates formed of wire gauze, and with separating partitions, H I, said spout also being arranged at right angles, or nearly so, to the horizon, on the outer end of the blast spout, substantially as and for the purposes set forth.

Second, The arrangement of a vibrating shoe, J, when made with two reverse incline shutes, one of which is adjustable, and made of wire or perforated plate, with the shute, K, and with the screening and separating spout, G, and the scouring cylinder, substantially as and for the purposes set forth.

Third, The employment of radially fluted scouring plates, J, when shaped on top in the form of truncated cones, in combination with radially fluted stationary concentrated prismatic rings, e f, substantially as and for the purposes set forth.

Fourth, I claim the particular arrangement shown and described of the screening and separating spout, G, blast spout, F, fan with valves, double reverse incline cockle shute, J, peculiar scouring apparatus, B, and dust spout, M, for the purposes set forth.

WROUGHT IRON GIRDERS—Thomas G. Gaylord, of Cincinnati, Ohio : I do not claim as new anything in the external form of the metallic tube or bar here exhibited, knowing that there has existed a structure somewhat similar in its general principles, in which, however, a different combination of the parts is employed.

But I claim the duplex girder or beam composed of an upper piece, having the form of an inverted Y, and a lower piece, having the form of an inverted T, whose stem or "comb" is adapted to fit closely within the apex of the upper piece, substantially as set forth.

SEED DRILLS—Robert Hamilton, of Franklin, Ind. : I claim the peculiar arrangement of the circular bottom I, as prepared, with the vibrating bar, H, pins, J, sides, F F, lever, D, slide, E, and cam, c, all operated and constructed in the manner set forth and for the purpose described.

CUT NAIL MACHINE—G. C. Grodhause, of Jamestown, Ohio: I claim the arrangement of the sheath, C, the circular guide, H, and the fork bar, I, as described, the said sheath, C, having its upper end pivoted at e, and its lower end traveling upon a track, f, the circular guide, H, extending from one set of cutters to the other, and the curve of its arc corresponding to the sweep of the lower end of sheath, C, and the fork bar, I, being attached to and carried by the same bar, F, which actuates the sheath, C.

[The novelty of this machine is in the construction of the feeder, which operates in conjunction with two cutters, and feeds the plate with regularity and rapidity.]

LIFE-PRESERVING FLOAT—George W. Hamilton, (assignor to himself and Oliver P. Bower,) of Watkins, N. Y. : I claim a life-preserving float constructed substantially as described, with annular concentric chambers and air receivers, combined with the central ballast, E, and radial braces and binding straps, I and m, as and for the purposes set forth.

WASHING MACHINE—Lewis Hannum, of Homer, N. Y. : I claim the employment of the projections, f f, in the bottom of the tub, in combination with the knuckles on the under side of the disk, as set forth, substantially in the specification.

APPARATUS FOR DRYING FRUIT—William Heaton, of Green county, Pa.: I am well aware that hot air vents, flues, heating cells, and vapor vents have been used, and therefore, singly, in themselves, I disclaim all such devices.

But I claim the construction of a fruit-drying apparatus, when formed with an inner casing or chamber, m m m m, having series of hot air vents, n n n n, series of hot air flues or heating cells, r r r, with the compound register chimney, f f, formed with a smoke flue, O J Q, and hot air exit flues, J J, and vapor vents or escapes, I I, when arranged and used substantially as described.

I am also aware that rotating reels and drying sieves and pans have been employed singly for various purposes and individual devices; I do not claim them.

But I claim the revolving or rotating drying reel, t u v w, the drying sieves, x x, and pans, y y, when used in arrangement with the casing, vents, flues, cells, register chimney, smoke flues, exit flues, and vapor escapes, in the manner and for the purposes set forth.

BLOW PIPES—Joseph Hollely, of New York City : I disclaim all arrangements of blow pipes substantially different from that above described.

But I claim a blow pipe provided with a faucet, J, spigot, L, and jet pipes, M N, constructed and arranged as described, in connection with safety valve, E, arranged and operating in the manner set forth, for the purposes specified.

GRAIN SEPARATORS AND CLEANERS—Simeon Howes, of Silver Creek, N. Y., and Gardner E. Throop, of Chicago, Ill. : We claim the combination of the tubes, I, and the outer casing, B, when so constructed and arranged in connection with the fan case, G, as to prevent the smut, &c., from coming in contact with the cleaned grain, as specified.

FLOATING ANCHOR AND LIFE-PRESERVER—Joseph Humphries, of Washington, D. C. : I claim, first, The floating drag or anchor, composed of three parts hinged together, two of which parts are of solid wood, the other part containing receptacles for water and bread, when said drag is used as a life-preserver, substantially as described.

Second, The arrangement of the bridle with the device for detaching the weight, when used in the manner and for the purpose as described.

ATTACHING THE GLASSES OF VAULT COVERS—George R. Jackson, of New York City : I claim the tapering and grooved glasses, in combination with the tapering and grooved apertures in the metallic portions of said covers, substantially as shown, and for the purposes described.

PROCESS OF MAKING SOAP—Campbell Morfit, of Baltimore, Md. : I claim the saponification of red oil, or red acid oil and fat acids generally, by means of powdered or dry carbonates of soda, as kelp, troma, sal soda, soda ash, bi-carbonate of soda, &c., and converting them into toilet and laundry soaps, in the manner substantially as set forth in the specification.

USING GRAPHITE IN REDUCING METALS—Joseph Weisman, of Philadelphia, Pa. : I claim the use and mode of using graphite plumbago, or black lead, for the purposes and in the manner set forth and described.

STEAM BOILERS—Henry Whinfield, of New York City: I claim the arrangement of the longitudinal, latitudinal or transverse, and vertical fire tubes or flues, as set forth.

MACHINE FOR CRUSHING ORE—Nathaniel Conkling, of Brooklyn, N. Y. : I do not claim for crushing or mixing any substance or substances, wheels, or one or more spheres or heavy balls, made to roll around in a stationary, circular, endless trough, nor do I claim arranging the axis of the trough, at an inclination from a vertical line, when spheres or balls are placed in said trough, and it is put in rotation; nor do I claim the application of a grinding wheel to a vibrating shaft, supported by a post, as in the machine of Davis and Miner, before mentioned.

But I claim in the machine constructed in manner and so to operate substantially as described; that is to say, with its circular trough arranged and made to revolve, horizontally or thereabouts and each of the wheels applied thereto, in such manner that it may be stationary, with respect to said trough, except in being capable of revolving on its axis, and of rising up and down, to accommodate itself to the ore in the trough, during the revolution of said trough, is supporting each wheel, G, by means of a rocker frame and guides, applied to it and the main frame, or arranged therewith, substantially in the manner before specified.

And I also claim the arrangement of a deflecting scraper with respect to the inner surfaces of each wheel and the trough, and so as to operate substantially in manner and for the purpose as before specified.

RE-ISSUES.

LARD LAMPS—I. N. Coffin, of Washington, D. C. Patented March 17, 1857 : I claim the combination of the hot air chamber, which is formed by the arrangement of flat, inclined wick tubes, in the manner above specified, with the lamp cap.

I also claim the combination of the flat inclined wick tubes, with the concave reflector, as above described, for the purposes above mentioned, my invention having special reference to a lard lamp.

EXTENSION.

MANNER OF SUSPENDING, OPENING AND CLOSING LOCK GATES—Henry McCarty, of Pittsburg, Pa. Patented March 16, 1844: I claim the described mode of suspending, opening and closing gates for locks and other places, by means of the aforesaid combination and arrangement of the inclined post E, rod G, swivel, H, stirrup, I and hog chains K, and the triangular hinged lever, segment way, N, cord, O, pulleys, R, and windlass, S, by which the expense of construction is reduced, and the old railway and rollers at the bottom of the lock, and the chains for opening and closing the gates placed in the water, where they are subject to constant oxidation and breaking and where they cannot be reached without much difficulty, when out of order are entirely dispensed with.

Literary Notices.

MUSPRATT'S CHEMISTRY—Parts 35 and 36 of this unrivaled encyclopædia of chemistry have just been issued by Messrs. C. B. Russell & Bros., Tremont street, Boston, and 290 Broadway, this city. These two parts are mostly devoted to gold; its sources, manner of obtaining it, refining, smelting and other operations. This is the most elaborate work on chemistry ever published.

THE NORTH BRITISH REVIEW—The present number for this quarter, republished by Leonard Scott & Co., No. 54 Gold street, this city, is one of the ablest and best ever issued. It contains two excellent essays on natural science, and eight others on history, biography, literature, poetry, capital and currency. This number is the commencement of a new volume, and is an excellent time to subscribe for it.

Correspondents

E. H. B., of N. Y.—We do not think a patent could be obtained for your invention. It has been proposed to make railway cars and meat-safes—the former with their windows, and the latter with their entire sides—of canvas, and to keep the canvas constantly wet by properly arranged pipes, to produce evaporation, for the purpose of cooling the interior.

W. C S., of Pa.—You can stain ivory black with a hot strong solution of logwood and copperas; and red with a hot solution of cochineal, cream of tartar, and a little alum, or what is better, muriate of tin—use a very small quantity of the latter. Those who color ivory boil it in those liquors for a few minutes. Wash the ivory in soap and water, to remove any grease from its surface, before you stain it. See a recipe on page 94, Vol. 12, Sci. Am., for dyeing ivory red.

C. E. S., of Minn. Ter.—We do not now remember any one who is engaged in making saw gummers at Little Falls, N. Y. A line to the postmaster at that place would probably get you the information.

R. Morisson, of Wilmington, N. C., wishes to purchase a hoisting machine for loading ships—one that will lift a hogshead of molasses. He desires to know the cost of a "beast" of this kind.

C. T. H., of N. Y.—You state that the most distant cars of a train approaching Owego on the side hill appear to be the largest, whereas they should appear of a diminishing size, and ask an explanation of the phenomena, as you have found it is not caused by the condition of the atmosphere. Without really seeing the train, we would be liable to give a wrong opinion of the cause; but we think it must be due to reflected light, by which objects on the sides of mountains appear, in the distance, much larger, sometimes, than they really are.

H. D. B., of N. Y.—You can probably get the carriage striping apparatus of Messrs. C. & C. by addressing them at Croton Falls, N. Y.

J. S., of Va.—It is not very novel to place a cradle on castors, so that it may be removed easily from one room to another.

B. P. B., of Pa.—We thank you for the complimentary allusions to our journal in your letter, and are much pleased to learn that through it you have been able to surmount your business difficulties.

J. B. F., of Ill.—In the Hughes' telegraph, the type wheels of two apparatus, (the one at Philadelphia and the other at New York,) are so registered, as we understand it, that the one sends a letter in the intermediate of the other, and thus on the line with one wire two operators can be sending messages simultaneously from one city to the other.

C. C. H., of Mich.—You have inquired of us how gas burners were bored. The operations are simple, but require skill. They are drilled out in the inside in a lathe, to form the hollow chamber, and the two small angle holes are afterwards drilled by a forked drill. This is for fish-tail burners. The bat's wing burner, with a narrow slot in the face, is first drilled in the same manner as that described for the fish-tail, then the slot is cut with a very fine saw. Proper tools are required for all these operations.

B. F. S., of Cal.—The increasing or decreasing of the number of buckets in a water wheel or spokes in a carriage wheel is not the subject of a patent.

G. A. T., of N. Y.—You can procure dies for making stencil plates from Smith & Hartmann, of 122½ Fulton street, this city.

T. G. S., of Ky.—You will find articles on the preserving of timber on pages 317 and 395, Vol. XI, and pages 3, 93 and 336, Vol. XII, Sci. Am. We understand that the process of preserving timber is still carried on at Lowell, Mass., and at Northfield, Vt., on the Vermont Central Railroad, where you can witness the operations. We have been informed that the treating of railroad timbers by Burnett's process affords a great saving in railroad expenses.

W. H. G., of Ohio.—There is no substance which you can interpose between a piece of soft iron and a permanent magnet to "stop" the attraction. The attraction of the magnet is inversely according to the square of the distance. Dry air or a plate of glass are about the best non-conductors known.

U. T., of N. Y.—The best substance you can employ to preserve wood exposed to water in a well is "pitch." Put it on the wood as hot as possible, and allow it to dry perfectly before you put it into the water. If you use the chloride of zinc or the sulphate of copper to impregnate the wood, long exposure in the water will tend to decompose the metallic salts, and thus injure the water.

W. M. S., of N. Y.—We have heard that the railway tunnel through Mount Cenis was suspended on account of the difficulty of supplying it with fresh air, but we doubt the correctness of such reports, because many coal mines with subterranean passages of much greater length are supplied with fresh air by well known means, which may be applied to the railway tunnel.

E. C. M., of N. Y.—We never buy or sell patents or accept an interest in any invention on any terms whatever, therefore your request cannot be complied with.

A. S. Langley, of Nashville, Tenn., desires to correspond with manufacturers of bakers' ovens and cracker machinery. He also wishes to purchase a good spoke machine.

W. W., of Cal.—Your plan of placing a screw in front of the plowshare to be kept revolving to prevent the stubble or grass collecting on the share is not new. A model presenting essentially the same feature has been in our office for some time. Your mode of steaming squirrels in their holes would not be patentable.

P. H., of Ill.—The first 26 numbers of Vol. XII we have not got to supply you. We can send you all the back numbers of the present volume.

F. P. C., of N. C.—We do not know of any machine for the separation of gold from other ores by washing that will do without constant watching, and we are inclined to think that such a one is wanted. Why do you not try and invent one?

J. C., of N. Y.—Those French timepieces to which you refer cannot be found for sale in this city.

B. R. B., of Pa.—The plan you describe for raising vessels or other objects is not new. The enclosing of an india-rubber bag within ribs of metal to inflate under the water after being attached to the object to be raised is an idea submitted to us very frequently.

E. T. B., of Ct.—Your egg-beater, we think, possesses patentable novelty.

H. M. H., of N. Y.—Feldspar is to be found in Thomson quarry, up about 196th street, on this island. We do not know the price of it.

M. J. H., of N. Y.—There are dams built with an inclined instead of a perpendicular face. These appear to embrace the same principle as that you have described to prevent vibrations. We do not think a patent could be obtained for your method.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, March 20, 1858:—

D. H., of N. Y., $55; G. P. J., of Iowa, $20; A. O., of Canada, $30; J. B. McC., of Ky., $25; J. H. F., of Vt., $20; J. M., of Ga., $125; J. T., of N. Y., $55; W. S., of Wis., $25; J. M. S., of Cal., $15; C. & B., of N. Y., $10; G. S. R., of Ohio, $30: G. H. K., of N. J., $30; P. & H., of Conn., $30; W. B., Jr., of Mass., $15; T. & S., of Pa., $12; B. A. B., of N. Y., $35; J. T. B., of Conn., $60; G. N., of Ohio, $90; H. H. P., of N. Y., $25; C. C., of R. I., $30; C. E. & J. N. G., of Pa., $27; W. C., of N. Y., $30; F. & L. A. C., of N. Y., $30; D. M. L., of Pa., $25; B. C. Van D., of Ohio, $25; E. A. C., of Vt., $10; G. W. D., of Iowa, $35; L. L. C., of Conn., $30; J. T. B. R., of N. Y., $52; F. Y., of Ky., $30; J. A. St. J., of Wis., $30; I. B. L., of Ind., $25; T. S. R., of Ga., $35; B. & W., of Pa., $30; S. T., of Mich., $20; L. B. S., of N. Y., $10; D. J. W., of Ohio, $30; J. McI., of N. Y., $25; J. T., of N. J., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, March 20, 1858:—

J. T., of N. J.; T. & S., of Pa.; B. & F., of N. J.; W. S., of Wis.; J. De R., of Ohio; G. P. J., of Iowa; T. S. R., of Ga; T. F., of N. Y.; H. & B., of N. Y.; J. B. L., of Ind.; H. H. P., of N. Y.; D. M. L., of Pa. B. C. Van D., of Ohio; C. E. & J. N. G., of Pa.

TO OUR SUBSCRIBERS.

Back Numbers—Complete sets of the present volume of the Scientific American can yet be furnished at the subscription price.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

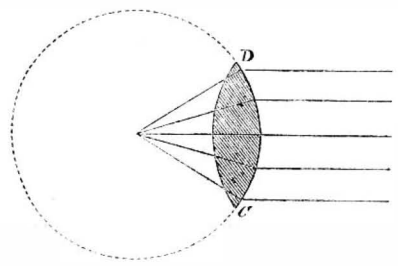
Receipts—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

TERMS OF ADVERTISING.

Twenty-five cents per line each insertion. We repectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

*** All advertisements must be paid for before inserting.

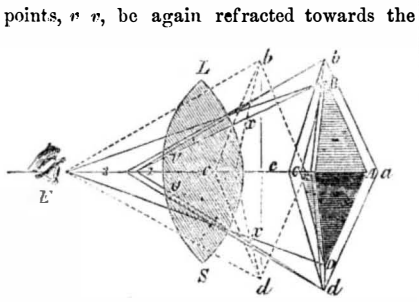
To continue the subject of lenses, in order that our readers may fully understand it, we present an engraving of a double-convex lens and it will be seen that the focus is nearly in



the center—in fact, exactly where we described it last week. The following figure will show the general principle on which a a convex lens magnifies:—

Let A B C D be an object, seen by an eye at E, through the lens, L S. The angle, B E D, is the *natural* angle under which the object would be seen if the lens were not there. But when the rays, B E and D E, arrive at the points, *x x*, they are refracted nearer to the perpendicular, and would meet in some point, 3, nearer the object than the eye is; and if the eye were not moved to that point, the object would not be distinctly seen.

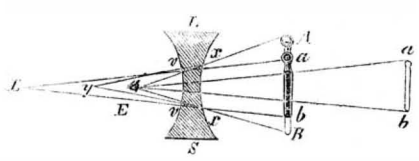
But, if the side of the lens toward the eye is also convex, as in the figure, the rays, *x* 1, *x* 1, will, in passing out of the denser convex medium into the rarer concave one at the points, *v v*, be again refracted towards the



axis, E C, and will meet at some point, 1, between the lens and 3; so that, in order that the object may be seen, the eye must be moved to the point, 1.

The ray which is made up of the three parts, B *x*, *x v*, and *v* 1, will appear to come in the last direction, that is, in the direction *v* 1, because the direction in which it falls on the eye is the only means that we can have of knowing the direction of light. But the direction of every ray from the object will be altered in the same proportion, and the outline through the lens will be the magnified outline, *a b c*; and if it be an object of which a particular magnitude has not been fixed by experience, it will seem magnified to that extent. But if it were one with the dimensions of which the observer was so familiar, that he assigned it the same magnitude whatever the distance were, then the impression would be that it had been brought nearer to the eye, as in the dotted lines, *a b c d*.

The following figure will in like manner illustrate the effect of concave lenses:—

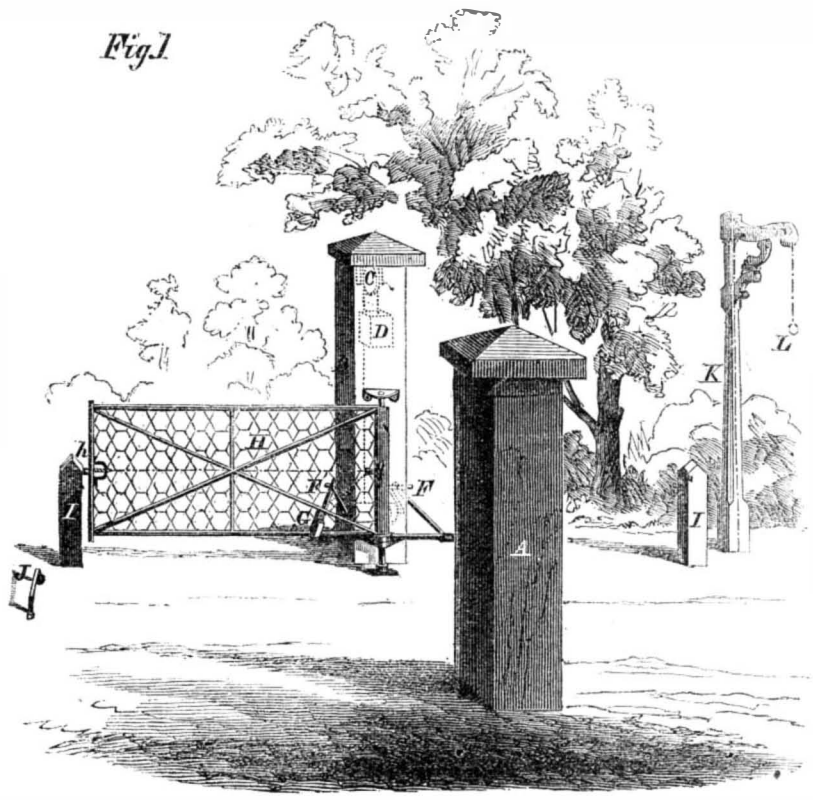


Let A B be an object, seen by an eye at E through the concave lense, L S. A E B would be the *natural* visual angle, if the lens were not there. But the rays, A *x* B *x*, falling upon the concave surface, *x x*, are refracted from the perpendicular, in the directions, *x v x v*, and would meet at the same point, *y*, behind the eye. But as they again fall upon the convex surface of the rarer medium (or, which is the same thing, pass out of the concave surface of the denser one) at *v* and *v*, they are again refracted from the perpendicular, and will meet at the same point, L, behind *y*.

They will have the last directions, *v z*, *v z*, so that in order to see them, the eye must be removed back to L, and the object will be diminished to the size, *a b*, or if size has been associated with it, it appears as if removed to the position of the distant *a b*.

HOWARD'S APPROACH OPENING GATE.

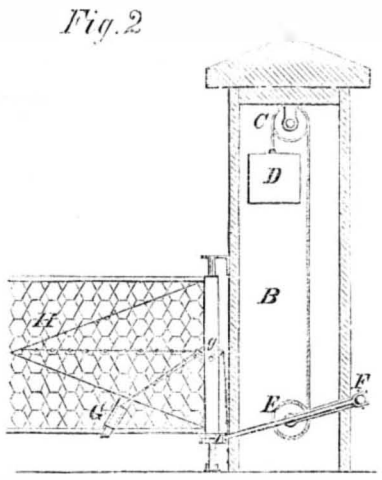
Fig. 1



The advantages and particular value of these gates have been so often expressed in the Scientific American that it is unnecessary now to reiterate them. The gate we are about to describe—the invention of Charles A. Howard, of Pontiac, Mich.—possesses over the advantages common to its class, the great merit of simplicity, and as our engraving shows, it can be made an ornament to a park or road without in any way detracting from its utility.

Fig. 1 is a perspective view of the gate, open, and Fig. 2 is a section through the hinge post. A is the latch post, and B the hinge post, in which there is a pulley, C, carrying a cord and weight, D. The other end of this cord is attached to, and wound up upon a shaft, E, from which, outside the post,

Fig. 2

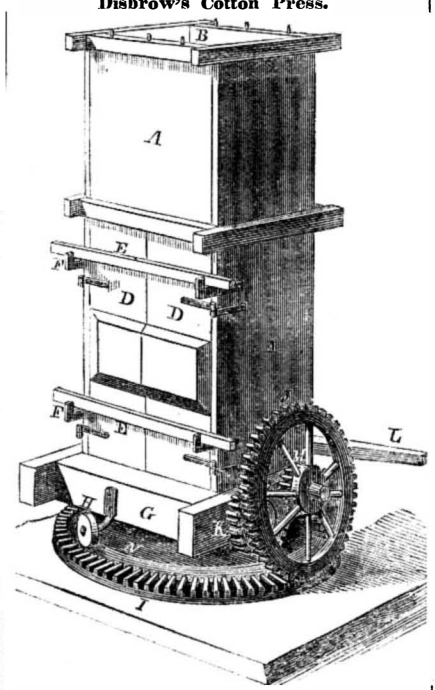


project the two cranks, F. The cord may either be wound upon the crank shaft directly or may be coiled on another wheel, and impart motion to the cranks by means of a cog-wheel. G are two small latches which are lifted up from either the handle, L, on the post, K, or the projecting piece, J, by means of the wires, *g*. H is the gate, and *h* a spring latch that is also pulled back when either of the latches, G, are lifted, so that it can be released automatically from either of the posts, I or A.

The operation of the gate is as follows: The weight, D, is wound up by a handle on one of the cranks, and the gate is then closed. The weight causes the cranks to meet under the latches, G, where they are held, and hold the gate in its shut position. From which ever side a person approaches, either by the carriage wheel passing over J, of which there can be two, one on each side, or by pulling the handle, L, the latch, *h*, is released, and and the latch, G, nearest the operator or carriage is lifted up, leaving the crank and weight to act on the opposite one, and so pull the gate open. When through, by again pulling the handle or pressing on J, the other crank operates and again shuts the gate.

It was patented Sept. 29, 1857, and any further information may be obtained by addressing the inventor as above.

Disbrow's Cotton Press.



On page 56, Vol. XII, of the Scientific American, we illustrated and described an improved cotton press invented by J. A. Disbrow, of Poughkeepsie, N. Y., and to that page we must refer the reader who wishes to obtain an intimate knowledge of the interior construction of the one now under consideration, as in that respect they are similar. It may be well to state that the follower is drawn down by ropes, which in some measure relieve the sides of the box from the great pressure of the cotton or hay on the sides. The invention in the present modification is in the mode of operating the drums on which the ropes are wound, and this will be seen from the accompanying engraving and description.

A is the box, being secured at the top, B, and having two doors, D, for the admission of the material to be pressed; when full, these are kept quite close by bars, E, fitting into catches, F. G is the base, provided with a small guide wheel, H, which steadies the press on the circular cog wheel, I, by moving in a smooth way, N. The press can be moved round this circle on a pivot in its center, by the lever, L. When the press is moved round, the large wheel, J, is rotated, and with it the small one, M, on its shaft. This gears into K, the shaft of which also carries the drum that winds up the rope and draws down the follower, so that by moving E the press is operated.

It is a convenient press, and was patented by the inventor February 2, 1858, by addressing whom, or R. L. Allen, 189 and 191 Water street, New York, more information can be obtained.

New Curtain Fixture.

J. F. Hall, of Bangor, Me., has invented a new attachment for fixing curtains. It is a curved spring attached to the upper half of the pulley (to which one end of the cord is attached), thereby creating a friction bearing upon its periphery, holding the curtain in place, and preventing the escape of the cord in drawing down the curtain. It was patented March 9, 1858.