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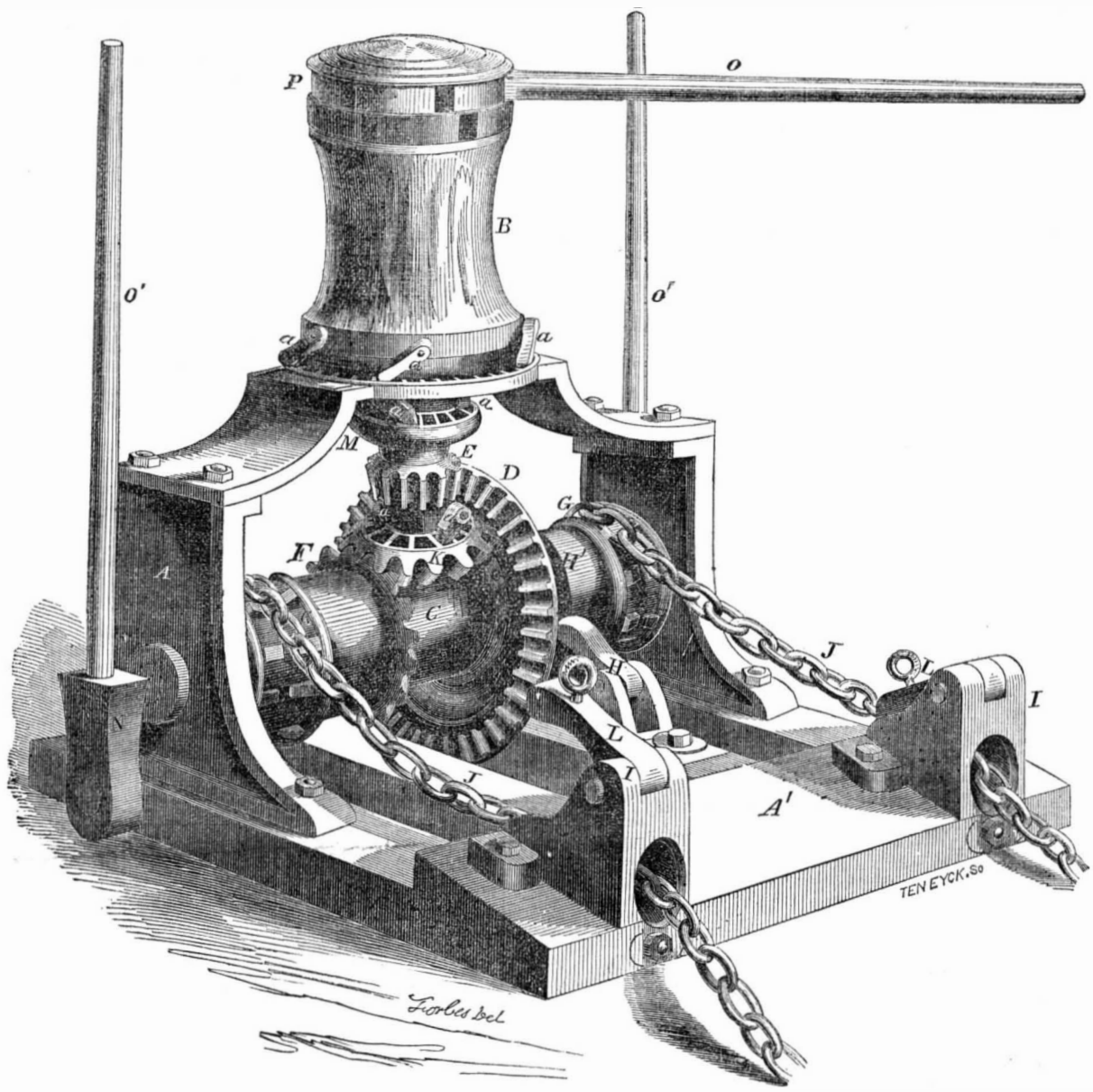
EMERSON'S PATENT SHIP WINDLASS.



Improvement in Windlasses.

The accompanying engravings represent an improvement in ships windlasses, for which a patent was granted to James Emerson, of Worcester, Mass., on the 28th of last month (Aug. 1855.)

Fignre 1 is a perspective view, and fig. 2 is a transverse vertical section. This invention consists in a peculiar combination of capstan and windlass, by gearing and devices, so arranged and operating that the shaft or axle of the windlass will be moved with a quick or slow, continual or intermittent rotary motion, and with a corresponding degree of power, one set of the working gearing being independent of the other, thus allowing the windlass, in case of the breaking of one set of gearing, to be operated by the other, and also to prevent a vessel, riding heavily at anchor, from sudden over-straining upon the cable.

In fig. 1, A A' represent a framing for a windlass and capstan, both of which are represented in combination. B is the capstan loose barrel, and P its cap, secured firmly on its vertical shaft or axis. It has boxes or holes for the reception of the handspikes or levers, O, to turn it. *a a* are the common ratchets or pawls for gearing the barrel of the capstan, B. The vertical axis or shaft of the capstan, B, extends down through the sole plate, and has two loose bevel wheels, E K, on it, which are brought into work as required, by ratchets, *a a*, secured to the shaft of the capstan, and which take into bevel notches on the top or caps of the wheels, to make the latter clutch with the shaft in a well known manner. The one bevel wheel E, gears into a large bevel wheel, D, on the windlass shaft, and the other, K, gears into a smaller bevel wheel, F, on the other side of the windlass barrel, C. These two wheels on the windlass shaft have collars, and are operated by slides or clutches, to slide in and out on the shaft, to gear and ungear with the bevel wheels, E K, on the capstan shaft, so as to give a fast or slow motion, as may be desired, to the windlass. G G are two grooved pulleys on the windlass for receiving the cable chains, J J, which are worked over them, and through openings in the blocks, I I, in which they are properly held by the brakes, L L. The windlass can also be worked by the handspikes, O' O', set in the boxes, N. H is the windlass ratchet working in the ratchet teeth on a sleeve, H'. When great power is to be applied to the windlass, for hoisting or weighing the anchor, of course a slower motion is required. This is given to it by throwing over the ratchets, *a a*, in the cap of wheel K, so as to throw it out of gear with the shaft of the capstan, and then setting the ratchets, *a a*, in the cap, M, of wheel E, so as to gear it with its shaft, and with the large wheel, D, on the shaft of the windlass, C; the wheel, F, being thrown out of gear on its shaft by a clutch. It is evident that if the large wheel, D, has two, three, or four times more cogs on it than E has, it will require just so many revolutions of the capstan to impart one to the windlass. On the other hand, a quick motion can be given to the windlass by throwing the wheel, D, out of gear by a clutch with wheel E, and bringing wheels K and F into gear in the same way as the wheels already described, and thus a high speed of windlass and a low power, and a low speed and a great power can be brought into effect, as may be wanted, according to circumstances.

Fig. 2 will convey a better idea of the internal arrangement of the gearing, and the parts

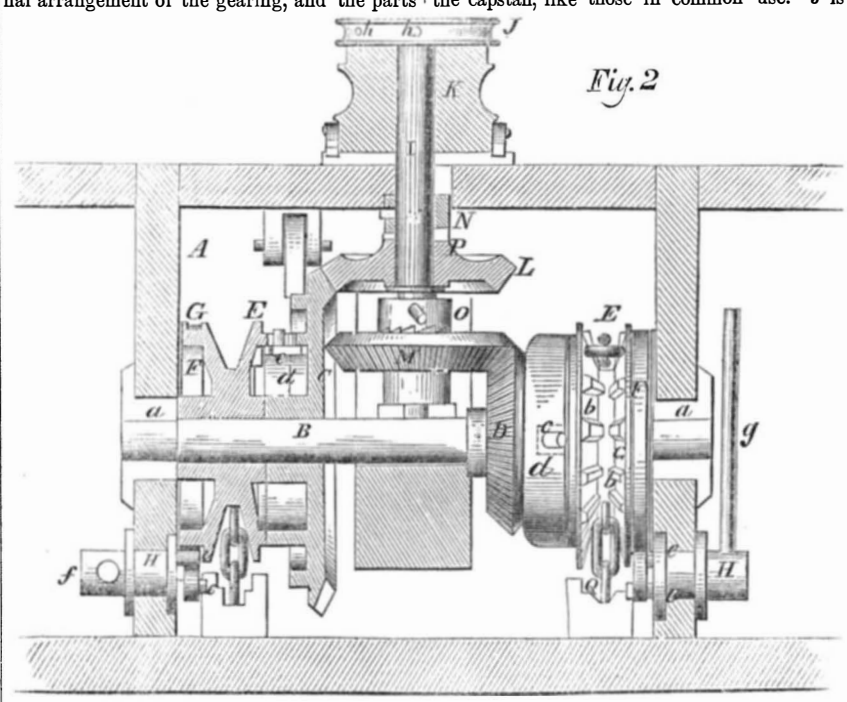


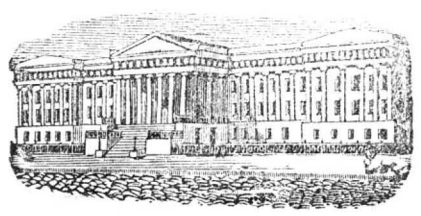
Fig. 2

its cap plate, with holes, *h h*, to receive the ends of the handspikes to turn it. P and M are the loose bevel wheels on the windlass shaft, I. Their ratchet clutches, N P O, to gear them with the shaft, I, when required, are more clearly shown in fig. 1, represented by *a a*. L is the upper bevel wheel on the capstan shaft, and M its lower one. The smaller one gears of the capstan and windlass. I is the vertical shaft of the capstan, extending below its sole plate, and B is the horizontal shaft of the windlass, with its gudgeons revolving in proper bearing boxes, *a a*. K is the loose barrel of the capstan, like those in common use. J is into the larger one, C, on the windlass shaft, B, and the larger one into the smaller wheel, D, so as to impart the slow and the great speeds of the windlass, as has been set forth. *c d* represent the clutch or slide of the collar of wheel D, and *e d* the clutch of wheel C, to gear and ungear these wheels with their shafts and respective wheels of the capstan. E E are two grooved pulleys, with teeth, *b*, in their faces, to hold the links of the chains or cables, Q. F F are smooth pulleys cast with the grooved pulleys, E E. Around each of these is a metal strap, G; the lower ends of these are attached to pins, *e e*, which are fitted to the faces of small shafts, H, having holes, *f*, for the reception of handspikes or levers, *g*, to work the windlass shaft.

If the cables, Q, are to be hoisted slowly by the windlass, the wheels, L and C, are geared together by their ratchets, N P, and clutch, *e d*, and the capstan is then set in motion. If a rapid motion is to be given to the windlass, these wheels described are thrown out of gear, and the ones, M D, are geared together by the ratchets, and the clutch, *c d*; and thus the different speeds are given to the windlass, for the purposes already stated. When the anchor is out, and the ship riding, the straps, G G, may be adjusted sufficiently tight around pulleys, F F, to prevent them from turning easily, and yet allow said pulleys to give a partial turn when the vessel rides heavily, so as to prevent a sudden overstrain upon the cable. The advantages claimed for this compact combined capstan and windlass deserve the attention of all nautical men, and all those interested in improving these machines for economising

labor and space on shipboard. It has received the approbation of many shipmasters; one is now building for a new ship at Medford, Mass.

More information may be obtained by letter or otherwise, of T. L. Ranlett, No. 157 South street, this city, or George P. Tewksbury, 140 Commercial street, Boston, where working models can be seen.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPT. 18, 1855.

LOOMS FOR WEAVING SUSPENDER WEBBING—Wm. V. Gee, of New Haven, Conn.: I claim, first, the method described of forming button holes, or other holes, in suspender webbing, and other fabrics, by weaving one side of the hole continuously, from the weaving of the full width of the web, then running back the web the length of the hole, and proceeding with the other side of the hole.

Second, the employment for operating the harness of a sliding lifting carriage, E, furnished with a number of catches, a a, corresponding with the number of leaves of harness, said catches being employed below the harness, opposite the lifting bars, C C, thereof, and being allowed to fall into the notches of the lifting bars of their respective leaves of harness, or being thrown out by a corresponding number of levers, f f, which are operated upon by a pattern cylinder, G, or its equivalent, substantially as described.

Third, the method of throwing off all the levers, f f, from the pattern cylinder, at every stroke of the loom, to admit of the turning of the cylinder, by attaching all the said levers to a superior lever, H, which is operated upon by inclined surfaces, i j, upon the connecting rod of the lifting carriage, E, substantially as described.

Fourth, the mechanism, by which the suspension of the operation of that part of the harness which carries that part of the warp which forms the side of the hole which is first woven, is effected, consisting of a rock shaft, s', carrying catches, s s, to hold up the harness, and a finger lever, t, attached to the lifting carriage, E, to act on a cam, s3, or its equivalent, on the said rock shaft, the said finger lever having imparted to it, by suitable means, a vibrating or side-to-side movement, at the termination of the weaving of each side of the hole, to actuate the rock shaft, to throw the catches, s s, in or out of operation, substantially as described.

Fifth, the method of returning the pattern cylinder to the position for commencing the pattern, after the weaving of the hole, by fitting the cylinder loosely to its shaft, and furnishing the end of the shaft with a fixed slide, R, to receive a movable slider, R', which is raised at intervals by a lever operated by a cam on a shaft, U, parallel to and geared with the cylinder shaft, and at the end of the formation of the hole, suddenly falls over a step on the cam, and throws down the slider, and thereby causes a fork, z', on the cylinder, and return it positively to the required position, substantially as described.

Sixth, forming those dents of the reed, which correspond with that part of the warp which forms that side of the button hole, is to be first woven, with a backward crook, n, above or below the plane, in which the closing of the sheds takes place, in order that by raising or lowering that part of the warp, of which the first woven side of the hole is composed; the said woven side may be allowed to go back the length of the hole, without obstructing the lay, in weaving the other side of the hole, as fully set forth.

Seventh, I claim the method of liberating the take-up roll from the pawls, m2 m3, to allow the backward movement of the web, and re-engaging it with the said pawls, by means of the lever, M, the hooked bar, q, the catch, q', and the arm, r, all operating substantially as described.

Eighth, I claim fitting the arm, r, loosely to the take-up shaft, and engaging it by means of a pawl, r', with the ratchet, and providing a fixed stop, r2, to arrest the said arm at a suitable point, whereby the take-up shaft is caused to carry the said arm, r, the requisite distance from the catch, q', corresponding with the length of the button hole, and then the arm to become stationary, till the ratchet is liberated, and then to return with the ratchet, to throw out the catch, q', substantially as described.

Ninth, the application, in connection with each of the let-off rolls, o o, of a brake lever, o', and a spring lever, q, the said levers operating as described, to control the let-off, and the spring lever acting as a backward take-up, to take back the web, to weave the second side of the hole, substantially as described.

[This invention relates, for the most part, to improvements in the mechanism by which the harness of the loom is operated, for the purpose of weaving button holes or openings in suspender webbing and other fabrics. It also relates to the construction of the reed, and to peculiar take-up and let-off motions for the same purpose; also to the construction of the harness, stop motion, &c. We should need engravings to convey a clear description of the parts. We regard it as an important and valuable improvement: we have seen some specimens of work done by it, and they are indeed beautiful. Mr. Gee is the inventor and patentee of other improvements in this line, which have been already noticed in our journal.]

CORN AND COB MILLS—Rensselaer D. Granger, of Philadelphia, Pa.: I do not desire to confine myself to any particular number of arms on the bridge tree, C, or pieces, F and H, as that must be determined by the size of the mill; neither do I wish to claim any particular size or arrangement of breaking or grinding teeth.

But I claim the adjustable horizontal guide rollers, i, in combination with the bridge tree, G e, spindle, D, and spring, d, for the purpose of maintaining an uniform relative position of the shell with the bur, and at the same time allowing the former to yield from the latter.

CUTTING WIRE—Wm. Grover, of Holyoke, Mass.: I claim the use of the circular plates, B, having radial slots, A, formed thereon, for the purpose of holding and cutting wire, together with the gauge, E, constructed and operating in the manner described.

[This instrument differs from the common knife-edged nippers only in the shape of its jaws. They are made round; in other words they are complete disks of steel, with holes of different sizes through their surfaces, for the reception of the wire to be cut. In its operation the handles are opened until a certain sized aperture in one of the disks comes in line with its equivalent opening in the other disk; the wire is then passed through and clipped by compressing the handles.

The ordinary nippers are apt to bend the wire in cutting; they also leave a rough burr on the ends of the pieces. But with Mr. Grover's improvement, wire may be very rapidly cut to any size or length, without the least bending, and with perfect smoothness. It is evidently a valuable improvement. Pianoforte makers and all others who have occasion to use large quantities of wire, reduced to particular shapes and dimensions will appreciate its excellence.]

STEAM GAUGE COCKS—Albert Bisbee, of Chelsea, Mass.: I claim the arrangement, substantially as specified, of the india rubber disk, or facing, to the screw plug, or stopper, imbedded and bound at its edges by an extension of the body of the plug, as described, with the stationary annular stopper seat of the cock, essentially as set forth.

FEED WATER APPARATUS OF STEAM BOILERS—Joel Densmore, of Blooming Valley, Pa.: I claim the arrangement of the tube C, to enter the boiler at the water line, B, with the steam chest and pump cylinder, constructed and operated in the manner described, by which the steam of the boilers assists the pump worked by the engine, to force water into the boiler, as herein set forth.

MACHINE FOR FELLING TREES—Thomas Durden, of Montgomery, Ala.: I claim the employment of cutters, C C, C', C', of the peculiar form shown, in combination with the feeding arrangement K' L, M, substantially as, and for the purpose set forth.

I likewise claim, providing each of the jaws of the dog with a projection, 6, and arranging and operating them as shown, for the purpose set forth.

[In the above improvement no saw is used, the cutting being done by means of knives which project horizontally from an upright shaft. Rapid motion is communicated to this shaft by means of cogged gearing; there is also a connection between the gearing and a screw which feeds the cutters up towards the tree as fast as they enter; the feeding parts are therefore self-operating. The frame of the machine rests on a four-wheeled truck, so that it may be conveyed about from place to place with facility. The apparatus is firmly attached to the base of the tree by means of a pair of iron spurs; a hole is bored, the spurs inserted, and then wedged.

This appears to be an excellent machine for the purposes intended. It is very compact, light, portable, and performs its work with rapidity. By the use of cutters, instead of saws, all the difficulties which attend the use of the latter, such as gumming up and sticking, are totally avoided.]

MOWING AND REAPING MACHINES—Wm. Burgess, of London, England. Patented in England, Aug. 16, 1854: I am aware that a "spiral or screw" has been employed for the purpose of clearing the track, in order that the wheels may operate upon the ground, and I make no claim to such a device.

But I claim as my improvement in addition to reaping or mowing machines, combining the archimedean screws with the platform thereof, for the purpose of delivering the cut crop off from the same, substantially in the manner as described.

[There is such a large number of American improvements in harvesters already existing in this country that the bringing of one over from England seems almost like carrying coals to Newcastle. The above improvement, however, strikes us as a very good one.]

CARD PRINTING PRESS—D. K. Winder, of Cincinnati, Ohio: I claim the combination of the connected chambers, C and D, of the platen, with the spring driver, E, of the bed, constructed, arranged, and operating substantially as specified, for the automatic feed and delivery of cards.

LANTERNS FOR LOCOMOTIVES—J. H. Kelly, of Rochester, N. Y. Ante-dated June 20, 1855: I disclaim the arrangement of lateral flues, as applied in the lamp case of Salmon Bidwell: also the arrangement of flues, as used in the patent of J. A. Williams: my invention being an improvement on both of these.

I claim the construction of locomotive lamp cases, with vertical descending flues open at bottom only, constructed substantially as set forth, for the purposes specified.

MACHINERY FOR PICKING FIBROUS MATERIALS—Richard Kitson, of Lowell, Mass.: I do not now claim, broadly, the application of a fan to the cylinder, in any manner, as one method of applying a fan is embraced in my patent of Oct. 31, 1854.

Without claiming here the use of a notched plate for securing the teeth to the cylinder, I claim casting or forming the notched plate with locking pieces, for the purpose of entering between the prongs, ff, of the teeth, into the grooves, which are formed in the cylinder to receive the teeth, and fitting down to the bottom parts or crotches, g, of the teeth, and thus securing them in place.

[In machines for picking cotton and other fibrous materials, the picking cylinder is generally covered with what is termed a "fillet;" this consists of a sheet of leather filled with ordinary card teeth. The heavy work at which pickers are employed requires that the teeth should be very firmly secured—else they break, bend, or otherwise refuse to do good work. Mr. Kitson's improvement consists in making the teeth separate and in attaching them, without any fillet, to the cylinder. His mode of attachment is such that they may be made larger and stronger, with corresponding advantages in durability, economy and thoroughness of operation.

The above is a good invention. Mr. K. is the patentee of several other ingenious improvements in machines for preparing and manufacturing fibrous goods.]

FIRE ARMS—Wm. W. Marston, of New York City: I do not limit myself to the size or character of arm fitted with my improvements; neither do I make any claim for rotating and cocking a fire arm simultaneously; neither do I claim the seer K, to act upwards and rotate the barrels, as this is also well-known.

But I claim, first, elevating the hammer to cock and discharge the piece by means of a cam, d, revolving with the barrels or chambers, and formed with as many points as there are barrels or chambers, so that the hammer shall be raised and discharged by simply rotating said barrels or chambers, as specified.

Second, I claim the revolving face-plate e, formed with projections on its face, to take the seer, k, and with notches on its edge taking the stop, 13, on the trigger, the two acting to rotate and stop the barrels at the precise point required, and prevent the strain on the trigger from turning the barrels too far, as specified.

Third, I claim the mode specified of constructing and fitting the parts of the cam, d, face plate, e, trigger, k, seer, k, and stop, 13, so that the hammer shall be cocked by one, two, or more pulls on the trigger, in the manner, and as specified.

SAFETY APPARATUS FOR STEAM BOILERS—John M. Reeder, of Nashville, Tenn.: I claim connecting the valve stems, D, and F, so that the valve, I, may be raised by hand from the outside to flood the fires, but cannot be weighted from the outside to increase the steam over a given quantity, as set forth.

PLANE BIT—Horace Harris, of Gorham, N. Y.: I claim the adjustment of the cap and bit with the grooves at each side, and of the thumb-screw at the top of the cap and bit, for the regulation of the cut of the bit, while the iron is held fast in the stock by the wedge fastening.

DOVETAIL KEY CUTTER—A. P. Hughes, of Philadelphia, Pa.: I claim the combination of two angular V-shaped and adjustable cutters, with the guiding tube, or its equivalent, substantially in the manner and for the purpose specified.

INSTRUMENT FOR DETERMINING LATITUDE AND LONGITUDE—John Stinson, of Danville, N. J.: I claim the use of the circle, C, with its shaft or handle provided with the cross piece, G, and the cross piece, H, or their equivalent, the whole being suspended from at, or near the center of the circle by means of the plumb wire and rod, I, which rod is jointed so as to move freely in the plane, passing through the axis of the circle, the whole being for the purpose above described.

[If we understand the design of this invention, it will (provided it operates successfully) enable the navigator to ascertain his exact position at sea at any time of day or night, without quadrant or chronometer, the only requisite being a sight of any known heavenly body. An important improvement truly—if it will do the work.]

BRICK MACHINES—G. W. B. Gedney, of New York City: I claim the off-bearing boards applied and arranged as specified.

I also claim the fingers for placing the board from the mold on to the endless apron.

COOLING CAST IRON CAR WHEELS—J. M. Sigourney, of Watertown, N. Y.: I claim the arrangement of the mold, chill and ring, F, operated in the manner set forth, for equalizing the cooling of the car wheel.

[To cast a car wheel, so that it shall come forth from the mold, perfectly sound in all its parts, and sufficiently strong in those parts where strength is required, is what many have essayed but few successfully accomplished. The great difficulties to be overcome lie in the unequal contraction of the metal while being cooled in the mold.

We are told that Mr. Sigourney has so successfully mastered these obstacles as to be enabled to cast car wheels with almost as much rapidity and certainty as the commonest iron castings are produced.

His improvements relate to a peculiar treatment of the mold, after the metal has been poured in; also in proportioning certain parts of the pattern to accommodate shrinkage. It is said that car wheels can be turned out on Mr. Sigourney's plan at a cost less by 50 per cent. than any other, while the article produced is much superior. We regard the above as an important improvement.]

REVOLVING FIRE ARMS—Frederick Newbury, of Albany, N. Y.: I do not claim the use of an oblique toothed ratchet wheel, nor the revolving mandrel attached to both cylinder and ratchet wheel.

But I claim the method of operating an oblique toothed ratchet wheel by the direct action of the upper limb, or cam end of the trigger, which trigger, also, by the same action, cocks and discharges the hammer, and holds the cylinder firmly in place during the firing of the piece, substantially as set forth.

I also claim the employment and use of a slot in the trigger directly upon the hammer, in order to enable the trigger to replace itself behind the hammer as before the discharge of the same, substantially as set forth.

I claim the apparatus for attaching and detaching the barrel to the stock, to wit: the catch lever lying in the stock, underneath the cylinder, with its hook, finger-piece, and spring, together with the recess and stop in the block.

SEAL AND STAMPING PRESS—Edmund Morris, of Trenton, N. J.: I claim the causing of the frame which contains the die, or plate, to work to and fro on a joint or hinge, so that the latter may be turned over with its face upward, as described, in a convenient position, to receive a supply of ink.

PIANOFORTE ACTION—Jno. S. Morton, of New York City: I claim the arrangement and operation together, shown and described, of the lever, b, pivoted to the jack, post, or cushion, e, and block, c, with the jack and hammer to effect the repeat; and whereby, while the use of an additional spring or weight, is dispensed with, the weight of the hammer operating on the lever, returns the jack to its notch in, or position under the butt, essentially as set forth.

[This invention consists in the peculiar application of a lever to the jack, in combination with a block attached to the hammer, whereby, after the hammer escapes, it is caught at a short distance below the string, and held in readiness for a free and rapid repeat; whereby, also, the return of the point of the jack into the notch of the hammer butt is facilitated.

In all pianoforte movements, one of the most important requisites is such an arrangement and connection of the keys with the hammers, as will permit an easy and perfect repetition of the same rate. Mr. Morton's improvement appears to possess superior excellencies in this respect. It has been practically applied to several of the ordinary instruments, and is said to render them equal in touch and tone to the best grand action pianos. If this is so it is certainly a very valuable invention.]

METALLIC PLATES FOR PRINTERS—S. W. Lowe, of Philadelphia, (assignor to himself and J. M. Beck, of Harrisburgh, Pa.): I do not claim engraving or etching designs, or figures of any kind, upon metallic plates or surfaces of any material, for the purpose of printing therefrom, as these processes have been known and practiced for a long time.

I claim coating the plane or unengraved face or surface of the plate (which is intended for leaving the white or unprinted surface of the paper,) with a mercurial amalgam, that will have the effect of preventing the ink used in printing therefrom, from adhering to or soiling the same, whilst the figures engraved or etched thereon, readily receive the ink, and thus admit of printing from the plate, by a letter or any other press, either from the plate alone, or from the plate in the same "form" with the type, without the "wiping" heretofore required in printing from steel or copper plates, substantially as described.

I also claim the coating the plane surfaces of etched or engraved steel plates, with an alloy of tin and mercury, substantially and for the purposes as described; and also the coating of etched or engraved copper plates, in the same manner and for the same purposes, and the coating of the plane surface of metallic embossing plates, in the same manner and for the more especial purpose of using the sunken parts, when filled up with a resinous substance as a plate to print from, thus saving an extra color-plate, when it is desired to have the parts to be embossed, first printed in any color.

[The finest specimens of engraving are produced by the use of flat plates, composed of steel or copper. The picture is first drawn upon the plates, and then cut out, line by line, by means of a tool called a "graver." To obtain an impression, the plate is smeared all over with a thick paste-like ink, care being taken to fill up the sunken lines of the engraving. The plate is now put upon a small stove and slightly warmed, and then the printer wipes off with a cloth, and with the palm of his hand, all the ink that is on the surface of the plate, but leaves the engraved lines full. The plate and the sheet of paper on which the print is to be taken, are now passed through a press of great power; the latter forces the paper into the inked lines of the engraving, and the picture is thus produced. The operation, it will be observed is a slow one compared with printing from types and analogous raised surfaces.

One of the most extensive uses for which copper and steel plate printing is at present employed, is in the production of bank notes. In no other way can those beautiful pictures which adorn our paper currency, be so distinctly and accurately produced. It is a species of printing which is very costly, comparatively, but its results are very perfect. Many vain endeavors have been made to cheapen it; the invention above recorded seems intended for this purpose; it is certainly very novel.

The inventor intimates, in his claims, that if the steel or copper plates are covered with a mercurial amalgam, as he proposes, they may be printed on common presses, with types, the same as wood engravings. Should this discovery prove thus practicable, it will be a glorious auxiliary to the typographic art.]

SAWING MILL—D. S. Howard, of Lyonsdale, N. Y.: I claim the method of setting the log forward, after each board is severed, by mechanical devices, operated by the weight of the log, substantially as specified.

Second, the method described of cutting from either end of the log, with a circular saw, by hanging the saw in a vibrating frame, or its equivalent, so that the axis of the saw may be above the log, when cutting from one end, and beneath it when cutting from the other end, so as to cut either way, against the grain of the wood

I claim the self-setting arrangement described, whether in connection with the circular saw, or the single or double-edged, reciprocating saw, as equally applicable to either.

COOKING STOVES—Jno. Van, of St. Louis, Mo.: I claim the arrangement of the water cylinder, with separate chambers, fire cylinder, or space, in its center, opening through its top and cross heating tubes, combined and operating, substantially in the manner and for the purposes set forth.

KNITTING MACHINES—Clark Tompkins and Jno. Johnson, of Troy, N. Y.: We claim, first, the manner in which we cause the frame which carries the take-up mechanism, to revolve in the same direction and with the same velocity as the needle cylinder, as specified and for the purpose set forth.

Second, combining the web-shaping plates, S and C, with the take-up mechanism, substantially as described, for the purpose specified.

CURTAIN FIXTURES—P. H. Niles, of Boston, Mass., (assignor to R. C. Webster, of Watertown, Mass.) Ante-dated March 18, 1855: I claim the combination of the bracket, having a hole of double diameter with the spring pin and the roller end, either with or without a spool thereon, fitted to correspond to said hole, and dispensing with the knob or cap, on the other end of the roller, substantially as described.

CLEANING COTTON—Samuel W. Brown, of Lowell, Mass.: First, I claim my within-described dome, having a rack or grind, in the upper portion of it, under which the cotton is thrown by the first beater, in connection with the fan in the exhaust pipe, leading from the top of the dome, for exhausting the dust from the cotton as it is thrown forwards by the first beater, essentially in the manner, and for the purposes set forth.

Second, I claim the use and application of two or more sets of secondary feed rolls, in connection with the beaters, which rolls take the cotton from the dome and deliver it to the second beaters, in several different places, so as to completely separate and agitate the cotton, to straighten and even the fibers and free the dirt from it, essentially in the manner, and for the purpose set forth.

HEATERS FOR SMOOTHING IRONS—Newell Cleveland & James J. Johnson, of Alleghany, Pa.: We claim the grated, or lattice worked heater for box smoothing irons, substantially as described and represented.

DESIGNS.

OVENS OF COOKING STOVES—G. W. Chambers, of Troy, N. Y. assignor to P. A. Palmer, of Leroy, N. Y.

CAST IRON MONUMENT—J. H. Wilson, of Chesterfield, Ill.: I claim a design for a cast-iron monument for the head of graves, combining the figures of the harp and heart, with a recess for the insertion of a miniature likeness and inscription, and a locket for hair.

Scientific Notes.

REVOLUTION IN GAS LIGHTING—We were much interested the other day, at the store of Mr. N. W. Turmer, with the inspection of an apparatus for generating gas from a new material, and the joint patentees for which are Messrs. A. A. Davis, of Lowell, and Mr. Cunningham, of Nashua, N. H. The materials for generating the gas, which is effected without the application of external heat, and by mere chemical action, consist simply of zinc and hydrochloric acid. This yields a gas of great purity and brilliancy as contrasted with the coal gas, the same quantity yielding twice the illuminating power. The whole apparatus is contained in a cylinder three feet in hight and sixteen inches in diameter; and by it every family may be its own manufacturer. Nor is there much care or attention required in its management, but a machine capable of generating sufficient for eight lights will require looking to and feeding only once a month or so. The residuum is chloride of zinc, and it is estimated will be fully equal in value to the original substances. —[Boston Evening Traveler.

This extract we have selected from one of our exchanges which gives the above credit to the Boston *Traveler;* and the New York *Tribune* of the 15th inst., under the head of "new inventions," presents the same article with some additions, and giving the same credit. We are surprised that the *Traveler* which often contains much correct scientific matter, should publish such scientific errors. The gas produced in the manner described will not give a good light, and the method of making it is not new. The gas is nothing more nor less than hydrogen, produced by the decomposition of the water—the oxygen of it combining with the zinc and leaving the hydrogen to escape. This gas requires carbon to make a white light, as it produces only a faint blue light burned by itself in the atmosphere. The machine described must contain some camphene, benzole, or naphtha to carbonize the hydrogen gas or it will not be able to produce a good light—and yet nothing is said about this. The same gas can be produced in the manner described by the use of hydro-sulphuric acid to dissolve the zinc, as in galvanic batteries. This gas cannot be produced so cheap as coal gas.

ALCOHOL FROM GAS.—Berthelot, the eminent French chemist, has succeeded in preparing alcohol by causing olifiant gas to unite indirectly with two equivalents of water. This discovery is interesting, because, except alcohol of sugar juice, it has been exclusively formed by fermentation. Pure and previously boiled sulphuric acid by long agitation with olifiant gas slowly absorbed the latter; and this on being diluted with water and distilled yielded alcohol. This is a discovery in synthetic chemistry. Olifiant gas can be obtained by heating a mixture of one volume of alcohol with two of oil of vitriol—sulphuric acid.

PIANOFORTE WIRES.—The excellent wire strings of the American piano of Ladd & Co., Boston, which has been so successful in Paris, were made at the wire factory of Washburn & Co., Worcester, Mass.

Recent Foreign Patent Law Cases.

GAS MAKING—On the 3rd of July last, a case for the infringement of two patents was decided before Chief Baron Pollock, London. The parties were George R. Booth, a practical chemist, as plaintiff, and J. Kennard, civil engineer, as defendant. The action was for the infringement of two patents granted to the plaintiff—one for the 12th Oct., 1850, and the other on 8th of May, 1852.

The first patent was for an improved apparatus for making gas from oil. Its novelty consisted in suspending the retort by the neck in a heated furnace, and making the inside of the retort corrugated. By this means a more equitable heat was obtained than by the old system of making gas from oil, by dropping the oil upon stones or bricks in the retort, which latter rested upon brick work, instead of being suspended by the neck in the furnace, and allowing the fire free access around it. The second patent was for making gas direct from oleaginous seeds, instead of first extracting the oil from them. This latter patent was stated to be valuable, as it enabled every farmer growing flax or rape seed to make his own gas by a small portable apparatus. The defendant had made and sold apparatus and materials for making gas in London, the same as those embraced in Booth's two patents.

The Chief Baron said, in giving his decision, that "he was decidedly of opinion that the second patent was void, inasmuch as the patentee, by it, claimed the making of gas from seed or any other vegetable substance, *by any process whatever*. This is fettering skill and genius for fourteen years in a way that the law will not allow. A more simple process might be invented for obtaining gas from seed, and other vegetable substances claimed, and the inventor prevented from using it."

The defendant's counsel said that if this was the view of Judge Pollock, and the direction he intended to give the Jury, he would tender a bill of exceptions to have the opinion of a Court of Error. The verdict was then taken as to this patent subject to the bill of exceptions, and the Jury discharged from giving a verdict on the first patent by consent of both parties.

DRESSING SILK—On the 7th of July, a case was decided in London, at the sitting of the *Nisi Prius*, before Baron Martin, and a special jury for the infringement, by J. H. Jourdain, of a patent for dressing silk, granted to W. Hendrie, on the 11th May, 1845. When silk in skeins is boiled or dyed, and dried in a loose state on poles, it appears lusterless, and has a cottony surface. To increase the luster, it has to be scutched, and wrung by a pin on what is called "a peg"—a horizontal wooden arm.—The improvement consisted in imparting a beautiful luster to silk skeins, by placing hanks of silk on a machine having distended arms, adjustable by screws, by which the silk was stretched fully out in a wet state, and then placed in a stove room, and submitted to heat until dry. The plaintiff had long been suspicious that the defendant was using his machine, and endeavored to obtain access to his premises, but could not for years, until the new patent act was passed in 1852. He then found that the defendant was using a machine for drying silk, consisting of three hollow metal cylinders heated by steam, two of which revolved, but fixed in their bearings, while the third was capable of rotation, and of being drawn further out on its axis by a powerful screw. The damp skeins of silk were placed over two cylinders, and passed around under the adjustable cylinder, and were distended.—These were then made to rotate until the silk became dry and was beautifully lustered. The plaintiff concluded that this machine, in every respect, infringed the claims of his patent.

On a cross examination, the plaintiff admitted that a machine which was produced in court for accomplishing the same results, had been in use in Manchester in 1839, six years before the date of his patent. This machine consisted of an upper and lower bar, adjustable by screws, on which the silk was hung and stretched until it was dry.

Sir F. Thesiger, the plaintiff's counsel, upon the production of this machine in Court, said the case was so strong against him, that he was not prepared to answer it, and would, therefore, submit to a nonsuit.

The method described of drying and lustering damp silk skeins will be of use to many of our manufacturers. Silk in the piece has been so dried from time immemorial.

History of the Telegraph; Difficulties and Success of an Inventor.

At the time the party which went from this city to witness and assist at the laying of the submarine cable between Cape Breton and Newfoundland were lying at St. John's, a dinner was given on board the *James Adger* to the public citizens of that place, at which Prof. Morse was toasted and complimented as follows:

"The steed called Lightning (say the Fates,)
Was tamed in the United States,
'Twas Franklin's hand that caught the horse,
'Twas harnessed by Professor Morse."

To this Prof. M., who was present, made a very appropriate reply. He said:

"I thank you ladies and gentlemen, most cordially, for the flattering mention you have made of me in connection with the electric telegraph, for it expresses the kindness, the generosity of your own hearts. But, ladies and gentlemen, I place myself as one only amongst the instrumentalities in this great enterprise of binding the nations together in the bands of electric intercourse. It is thus only that I find relief from what I may truly style the oppression of praise. It would be hypocrisy in me to affect callousness or indifference to the good opinion of my fellow men. I have not so superficial a self-knowledge as not to be aware that there is something within this bosom ever ready to kindle at the least spark of praise, a pride that would give utterance to the arrogant boast, "Is not this great Babylon that I have built, by the might of my power and for the honor of my majesty." Who is it that commands the lightnings to go, and they go? Who gave the telegraph to the world? An incident in the early history of the telegraph is directly pertinent to the answer to these questions. At two sessions of the Congress of the United States, my petition for the pecuniary aid of the government to construct the experimented line of telegraph from Washington to Baltimore, to test its practicability and utility, dragged its slow length along, and the close of the session of 1842 and '43 threatened a result as inauspicious as the previous session of 1837 and '38. I need not more than allude to the fact that in the previous session of 1837, I had expended all the pecuniary means I possessed to sustain myself at Washington while urging upon the attention of Congress this then untried, this then generally esteemed visionary enterprise of an electric telegraph. Years were required to put myself again in a pecuniary condition to appear before Congress with my invention, and now I saw the last day of another entire session just about to close, and with it the prospect of still another year's delay. My bill had indeed passed the House. It was on the calender of the Senate, but the evening of the last day had commenced with more than one hundred bills to be considered and passed upon before mine should be reached. Wearied with the anxiety and suspense, I consulted with one of my Senatorial friends; he thought the chance of reaching it so small that he advised me to consider it as lost. In this state of mind, I returned to my lodgings to make my preparations for returning home the next day. My funds were reduced to the fraction of a dollar. In the morning, as I was about to sit down to breakfast, the servant announced that a young lady desired to see me in the parlor. It was the daughter of my excellent friend and college class-mate Henry L. Ellsworth, the Commissioner of Patents. She called, she said, by her father's permission, and in the exuberance of her own joy, to announce to me the passage of the telegraph bill at midnight, but the moment before the Senate's adjournment. This was the turning point of the telegraph invention in America. As an appropriate acknowledgment for her sympathy and kindness, a sympathy which a woman can feel and express, I promised that the first dispatch by the first line of telegraph from Washington to Baltimore should be indited by her. To which she replied, 'I will hold you to your word.' In about a year from that time the line was completed, and everything being prepared, I apprised my young friend of the fact. A note from her enclosed this dispatch: '*What God hath wrought!*' These were the first words that passed upon the electric wires on the first completed line in America."

[As the success of every useful invention encourage men of capital to assist in the introduction of others, so every deceptive scheme exerts an opposite influence. For these reasons, we have always freely expressed ourselves against useless novelties calculated to deceive the public, well knowing that they tended to injure the prospects and interests of honest useful inventors. We early advocated the claims of the electric telegraph to public patronage, and felt a sincere pleasure in doing so, and we have witnessed its unparalleled success in all parts of the world, with nearly as much enthusiasm as the inventor. It is but eleven years since the telegraph line of 40 miles in length, spoken of by Prof. Morse, was built, and now there are no less than 32,000 miles of telegraph wires on our continent. Was ever success more complete or more astounding? Never. These 32,000 electric nerves run east, west, north or south, and form the public heart-strings of 27,000,000 of people. Day and night they cease not to throb with intelligence, and they confer upon man a power of semi-omnipresence. In Europe lines of telegraph have been constructed to an extent nearly rivalling those in America, and difficulties have been met and overcome far surpassing in magnitude any of those in our own country. The electric wires extend under the sea of the English Channel, the German ocean, and the Mediterranean. They pass from crag to crag on the lofty Alps, and run through Italy, Switzerland, France, Germany, and Russia. They will yet extend through the Atlantic ocean, and their circuit—"the ends of the earth."

[For the Scientific American.]

Encroachments on the Patent Office.

The letters and articles on this subject, which have appeared in your paper of late, are unfortunately but too deserving of the attention they claim, and, if redress is not found at present headquarters, the sooner a change of those who preside takes place, the better. But what if it does, how is the evil already committed to be remedied,—*possession* is well known to constitute nine-tenths of right, as viewed by the law, and, supposing a change of the presiding deities to be effected, what is to insure exemption from a continuance or repetition by another, of the outrages of which you so justly complain? Does not the history of the past show that like evils, though never to the same barefaced extent, have, through almost every Administration been—here a little and there a little,—perpetrated, till the Patent Office has been robbed of almost all its just rights,—its room applied to purposes totally foreign to its character, and its Chief left without the right to appoint those as his officials for whose acts he is held responsible.

Complaints as to encroachments, then, are useless as long as the Patent Office remains a dependency of the Department of the Interior. Murmurings equally as loud and just have before been heard, but with little or no effect, and if present outrages be arrested, the disease will again, ere long, break out, perhaps in a more violent form than ever. You do right, therefore, in attacking the root of the disease. Make the Patent Office a Bureau of Invention, as you propose, with its Secretary to "enjoy all the advantages that the other chief officers of the government possess," then, with a Charles Mason as Secretary, and an examining corps, etc., left to his appointment, the Institution could not fail to be one of envy and admiration to the world. The space now pillaged from the Office would soon be filled, open to clear daylight inspection, with useful models of both patented and unpatented inventions, as prescribed by law. As a Bureau of Invention, free and unshackled in its operations, it would quickly be seen that the arts and sciences, on which the prosperity of the country depends, took a nobler and a wider flight, and flourished in proportion to the protection and encouragement bestowed on them. More that is beautiful, as well as useful, and equally the offspring of inventive genius, would here find a home, a fostering care, that would serve to refine the minds and morals of our people; while the mechanic arts, which almost alone have made us superior to the savage, would then find in the Patent Office a nursery for their growth, which at present they so imperfectly experience.

Shall interests so important be trampled upor, or treated as but of secondary value, or be made the dirty tool of a political movement?

Such has been done, and is now being done.

Inventors, rouse yourselves for once from your supineness, and each think and make it his business to interfere. The Patent Office must have larger powers given it, and then you will have less cause for complaint. A remedy has been proposed—see to it, and that earnestly, promptly, by convention or not, as you please, but, ere next Congress meets, have your petition ready; see that it fails not in the number of petitioners, but let it be both long and strong. You have no time to lose; evils are being done that may be beyond the reach of remedy soon, and your grievances are many.

INVENTOR.

Washington, Sep. 21, 1855.

Oil Used on Railroads.

We are indebted to Edward H. Jones, master mechanic, for a table of the miles run and the oil used, by each engine, on the Albany and Utica division of the New York Central Railroad during the months of July and August last. The practice of publishing monthly tables of the amount of oil used on this railroad and the Erie, is working wonders. We published statistics of the use of oil on the Central Railroad during the month of May last on page 396, last volume. On the above division of this road, there were 49,988 miles run in May, and 3,624 pints of oil used, being 13 4-5 miles run to one pint. During the past month (August,) 46,675 miles were run, and 2,904 pints of oil used, being sixteen miles run to one pint. The greatest number of miles run to one pint of oil was 23,75-100, by engine No. 15 (Freight,) D. Apps, engineer, and it is remarkable that this engineer run his engine in July 2,370 miles, and in August 2 375 miles, using 100 pints of oil exactly each month.—This we call steady management. It is stated in this report, that the passenger and helping engines use more oil in proportion on account of the grade, than the freight engines—the amount being one pint for only eight miles run. One of the conditions to be taken into consideration in judging of the economy of each engine, is the amount of load drawn, or, what is better, perhaps, the length of trains. The publication of these reports giving the quantity of oil used, and the miles run by each engine, will call forth the unceasing vigilance of engineers to the condition of their locomotives, and also direct peculiar attention to their character. Only one engine—the *President*—with inside connections is reported; all the oth ers have outside connections. During a recent trip over this division of the Central Railroad, we were most favorably impressed with the character of the best locomotives used on it and built at the Schenectady Works, under the able superintendance of Walter McQueen, M. E. They are powerful, beautiful, and skilfully constructed engines, and have a deservedly high reputation.

Discovery of a Dangerous Reef.

The discovery of a rock in the Gulf Stream, heretofore unknown, is announced by Capt. Tessler, of the American trading ship *Pierre*. The rock is stated to be in N. lat. 35° 14′, W. long. 73° 21′. It lies in the direct path of vessels running between the Southern ports of this country and New York, Europe, &c. The head of the rock presents a surface of only 50 square feet, and rises but a few inches above the surface of the water. Lieut. Maury will have to send out a vessel to make special examination.

The Weight of Castings by Patterns.

MESSRS. EDITORS—Some time since, I think you said that a rule for finding the weight of a casting by weighing the pattern, would be useful. Our patterns are made mostly of white pine, commonly called here "hill pine;" each ounce of such patterns we call equal to one pound of iron, or a little over, say one-tenth for instance. A pattern that weighs 50 ounces we say the casting will weigh 55 pounds.

Chenango, N. Y. N.R. M.

A solution of muriate of gold will stain hair an auburn color.

New Inventions.

Improvement in Windmills.

The annexed views represent the windmill of Dr. F. G. Johnson, of Brooklyn, for which a patent was granted on the 9th of January last.

Fig. 1 is a perspective view of the windmill; fig. 2 is a view of the regulating wheel and weighted levers, and fig. 3 is a vertical side section of the wind wheel and adjuncts. This wind wheel, that is the sails and devices connected with it on its shaft, will regulate its own velocity, wholly independent of any other connection.

DESCRIPTION—Fig. 1 : O O and P represent the standards and braces of a strong frame to support the machinery. They may be of timber or cast iron. L is a hollow post, through the center of which passes the vertical shaft, M, which receives motion from the wind shaft by bevel gearing, and conveys it by a band from pulley, T, to other machines. R is the step bearing of shaft, M, which has also a crank, U, upon it. S is a screw bolt in the bottom of the bearing box of M, to elevate or depress said shaft. N is the horizontal shaft of the wind wheel; it is supported in proper bearings in a small iron frame, K, springing out from a strong hollow band on the top of the hollow post, L. A A are the wind sails or fans; there are sixteen shown in the figure and represented with their edges turned to the wind. B is the wind vane. It is made of oiled canvas, C, laced into an iron frame, *d d*. The iron rods, *h h*, are fastened to the vane and frame, K, and serve as braces. Each fan, A, is composed of a wooden frame, and a sail surface of oiled canvas. It is secured on a central spindle or axis, which at one end plays in the rim, F, of the wheel, and its inner end in a metal plate which has a slot in it to receive a metal pin on the periphery of the regulating wheel, to turn the axis of the fan so as to allow the sail to be exposed full to the wind, or at any angle according to the velocity of the wind wheel. E E are spokes, equal in number to the sails. These are fastened securely in a hub, and into the tire or band, F. *a a a* are wires to brace the spokes. X X X are weighted levers of the regulating wheel.

On the shaft, N, of the wind wheel, there are placed three iron wheels, (fig. 3,) *h* is the spoke wheel, *c* is the regulating wheel, and *d* is the brake wheel. The hub, *h*, is firmly secured on shaft N; the other two wheels are not keyed, but free to move back and forth. The regulating wheel and brake wheel revolve with shaft N.

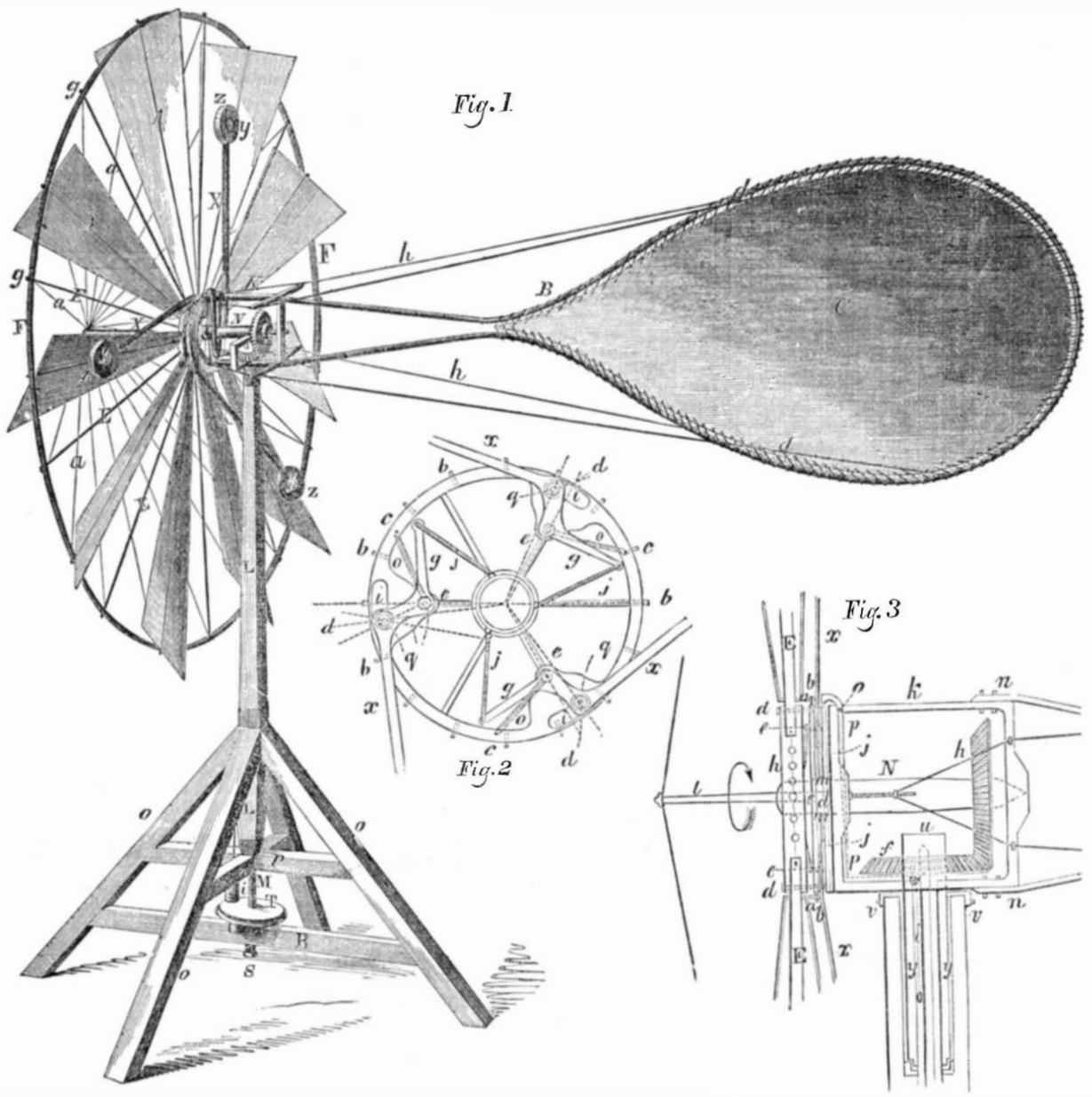
In fig. 2, *c c* represent the iron regulating wheel on shaft N. *b b* are pins in its periphery. *x x x* are three levers, having their fulcrum pins *q q q*, at *d d d*, secured in the hub, *h*.—These levers are weighted at their long ends by weights, Z Z Z, (fig. 1,) fastened by thumb screws, *y y y*. *e e e* are bolts fastened to the short arms, *g g g*, of the levers. These have spiral springs, *o o o*, secured to them, and they pass out nearly to the periphery of the hub, *h*, and are attached to it for the purpose of keeping the short arms drawn back, and to drag back the regulating wheel, *c*, which, by pins, *b*, in its periphery inserted in slots (at *a*, fig. 3) in the plates which receive the spindles of the fans, keeps them properly adjusted. *j j j* are cords fastened to the extremities of the short arms, *g g g*, and to the grooved rim, *m*, of the brake wheel.

In fig. 3, *h* is the fixed iron hub on shaft N. In it are fastened the inner ends of spokes E. *c* is the regulating wheel, and *d* is the brake wheel—the two latter are not keyed to the shaft. *l* is an iron bar fastened into the shaft, N. To the end of this bar are secured iron wire braces (*a a a*, fig. 1.) *k* is the iron frame to support the wind wheel. It is united to the sleeve, *y y*, in the hollow metal band, *v*, on the top of the hollow post, into which it extends down three or four feet, and terminates in a washer, and is capable of turning round on the post to turn the wheel to the wind in whichsoever direction it may be blowing. *h f* are bevel wheels. *j j* are cords, and *p p* is a brake to act upon wheel *d*, at the point, *o*, by a person pulling the cord, *i*, seen in fig. 1. A screw bolt tightens the braces, *h h*, fig. 1, and to give the vane, B, a greater or less angle with the shaft, N.

OPERATION—The principle upon which the regulator of this windmill operates is centrifugal force acting against the tension of the spiral springs, *o o o*, fig. 2, attached to the short arms of the weighted levers, X X, and to the hub. The tension of the springs keeps the sails set to receive the wind, and the centrifugal force of the weights turns the sails out of face or edgewise, to the wind, whenever the velocity of the wheel becomes too great. Thus, suppose the wind wheel to commence and revolve at its greater velocity, the weights, Z, by centrifugal force, would be thrown out to their greatest distance from the center of motion, which would have the effect, through the medium of the levers, X X, and regulating wheel, to turn all the sails edgewise to the wind. The tendency of the wind wheel now will be to revolve slower and slower, until the tension of the springs, *o o o*, fig. 2, shall overcome the centrifugal force of the weights, and turn all the sails back with their surfaces presented to the wind again, thus giving the mill (whenever the wind is sufficiently strong) a uniform velocity, irrespective of the amount or variation of resistance presented to it; for, an increase of resistance having the tendency to lessen the velocity, simultaneously diminishes the centrifugal force of the weights, thereby giving a corresponding increase to the motive power, by presenting more surface of sail to the wind, and vice versa.

The sails being pivoted at each end nearly in the center, allows them to be easily controlled

JOHNSON'S PATENT SELF-REGULATING WINDMILL.



by the regulation wheel. In strong and sudden gusts of wind, the regulator is not dependent upon the velocity of the mill for its operation, but upon the inertia of the weights. Thus, if a sudden rush of wind strikes the sails, the wheel will instantaneously start, but the weights, by their inertia, will not start with it, so that the sails are as instantaneously, or simultaneously, turned edgewise to the wind. Otherwise, before the necessary velocity for operating the regulator could be obtained, the mill might sustain injury.

To stop and start the mill at pleasure, a four or five pound weight (*i*, fig. 1) hung upon a wire, passing over a small pulley, crowds the break upon the stop wheel at the point (*o*, fig. 3,) which, partially stopping, or rather holding back the stop wheel while the main wheel revolves on, has the effect to wind the cords, *j*, around the grooved rim of the stop wheel, which throws the weights out, and turns the sails edgewise to the wind, and the mill stops. By taking off the weight, *i*, the springs turn the sails back to the wind, and the mill instantly starts.

To give the mill a greater or less velocity at any time, it is only necessary to move the weights, Z, by means of the thumb screws, *y*, at a less or greater distance from the center of motion. To provide against the mill being turned out of the wind by its own force acting on the perpendicular shaft or resistance, the vane is set at a slight angle with the line of the horizontal shaft, which has the effect, when the mill is at work, to bring the wind wheel directly facing the wind.

The connection between the sails and regulating wheel may be made by means of a slotted projection on each sail plate, slipped upon iron pins in the periphery or edge of the regulating wheel, as described; or by cogs on the edge of the projections working in cogs on the regulating wheel. They can be made both ways, according to the size of the mill. The patentee informs us that a mill of from 16 to 20 feet in diameter, and of from 4 to 6 horse power will cost from $135 to $200.

Further information can be had by addressing Dr. F. G. Johnson, 196 Bridge st., Brooklyn, N. Y.

New Air Spring for Railroad Cars.

A trial of a new air spring was lately made on a car belonging to the Harlem Railroad, running from this city. The inventor is James F. Hayward, of Wilmington, Del. Patent granted Dec. 12, 1854. The improvement consists in providing a metallic cup, over the top of which a strong elastic diaphram, of rubber and leather, is stretched—like the skin of a drum-head. The car bottom is furnished with rounded projections, which rest on these diaphrams.

The use of air springs on railroads has heretofore been abandoned, owing to the impossibility of rendering the air cylinders and plungers sufficiently tight. In the present improvement no plungers are employed. The air within each cup is compressed to 150 lbs. pressure.

The experiment is said to have been very successful. The superiority of this spring, over those composed of metal or rubber, is stated to have been very sensible. The cost of application is only about 50 per cent. as much as the other kinds.

This spring appears to be somewhat similar to that invented by Mr. William Beers, of New Haven, Conn., illustrated and described on page 332, Vol. 4 (1849) SCIENTIFIC AMERICAN. The only difference is, that the vessel containing the air was made wholly of yielding or elastic material, instead of partly, as in Hayward's plan. Mr. Beers employed an air cushion placed inside of a cup with the supporting plungers resting on the cushions.

Types of Hard Metal.

The Middlesex, Mass., *Journal* states that Mr. Samuel Weed, of that place, has invented a machine for making types out of copper, iron, brass, &c. Many attempts have been before made to do the same thing, both in this country and in Europe, but without practical success, on account of the expense of production. A successful improvement of this kind would confer vast benefits to the art of printing. At present, types are cast in soft metal, and they soon wear out.

Bailey's patent car seats are being tried on the night express trains of the New York and Erie Railroad. These seats are made so as to be convertible into reclining lounges when desired.

A correspondent of the New York *Tribune* states that a scheme is on foot in Boston to establish an Inventors and Industrialists' Exhibition,—the proceeds to be distributed among the contributors. This is a good project.

Scientific American.

NEW-YORK, SEPTEMBER 29, 1855.

The Scientific American Prizes.

The fourteen splendid cash prizes which we offer to those who are most successful in obtaining subscribers for our paper, still remain open to competition, and will continue so until next New Year's Day. The first prize is for the snug sum of one hundred dollars; the second, seventy-five dollars, and so on down. In addition to these inducements, there is a liberal deduction from the regular subscription price to all who canvass for names; so that if competitors are active they may almost double the amount of their prize money.

We venture to say that few young men can better remunerate themselves in a pecuniary point of view, hour for hour of time employed, than by exertions spent in obtaining subscribers to the SCIENTIFIC AMERICAN. It is a species of work that may be taken up at any time—in the evening after the labors of the day have closed, or whenever other convenience permits. For every hour thus spent, we repeat, they are almost certain to be well repaid, besides enjoying the satisfaction of having aided in the promotion of a good work.

The present season is one of such peculiar prosperity, that nearly every one feels more liberally disposed than usual. It is therefore an excellent opportunity for our friends to promote their own interests, as well as ours, by seeking subscribers. We have no doubt that their efforts will be crowned with entire success.

A Word to Old and New Friends.

We have an idea that there are quite a number of our old friends who are just now wondering why it is that their copy of the SCIENTIFIC AMERICAN does not come to them with its accustomed regularity. Perhaps some of them are finding fault with the publishers, and are just on the point of forwarding a "blow-up" letter, in order to have the grievance corrected.

We shall take the liberty of saving them this trouble by plainly stating that the fault is their own. Their year is up; they have not renewed, and we have crossed off their names: hence their failure to receive the paper. Their only remedy is to remit the money for a new year; the welcome smile of the SCIENTIFIC shall then again greet them as regularly every week as before.

Both old and new subscribers will do well to remember that the earlier they remit their subscriptions the better. For the present, we can accommodate our patrons with numbers commencing with the first of this volume, but in a short time hence we may be unable to do so. Therefore hurry up your subscriptions. Not a single number should be lost or missed, if it can be avoided. Each copy contains something new, important, and useful—perhaps the very information that has been wanted for years. Here is a case in point, from an old Ohio friend: in writing to renew his subscription he says:—

"I commenced taking your valuable journal five years ago,—almost entirely because I wished to obtain information on woolen dyeing. For nearly that period I have opened almost every number to be disappointed, but finding so much valuable information on other subjects, I continued on, until, at length, I have found myself very bountifully supplied with the information I needed, and amply repaid for five years of suspense."

The Plague; its Origin and Disappearance.

This is the title of a remarkable article in the last number of the *Medical Examiner*, (Phila.,) by Augustus T. Stamm, who writes from his own observations in the native country of the plague.

The Plague, the Pestilence, the Typhus d'-Orient—different names for this disease—has been known to the readers of history as extending far back for thousands of years. It repeatedly visited the whole of the old world, raging with fearful destructiveness even to the frozen Steppes of Russia. It sometimes broke out in a place during hot weather and great suffering for food, and in another place during pleasant weather and prosperity; and its causes thus seemed to baffle all theory in accounting for it. In Europe it at last began to be suspected that it came from the East, as it was found to be epidemic there, when the cleaner parts of Italy, France, and England were exempt; and as its contagious power was terrible, in being introduced in the exchange of merchandise along an infected frontier, the quarantine regulations were established to prevent its introduction—measures which were found effectual when properly executed. This led to the tracing of the plague to its seat, and it became evident that Egypt was its birth place. Upon earnest inquiry, it was discovered that Cairo, and the villages surrounding the Delta near it, were generally attacked first, and suffered most, and the reason of this was found in its condition and situation. It was surrounded by neighboring hills, which prevented the winds from circulating through the streets, and carrying off injurious gases; a filthy and neglected canal ran through the city, and in its neighborhood was a large fetid marsh. Mehemet Ali, in 1840, ordered the streets to be watered and swept every morning, but the state of health did not improve. He then ordered a large portion of the surrounding elevations or hills to be carried down into the lowest fields, and the marsh to be filled up, and converted into gardens. Thousands of peasants were forced to work in carrying out these despotic but wholesome commands, until a long chain of hills were lowered, and the miasmatic fields converted into smiling olive gardens. As this work progressed, the health of Cairo improved, until in 1844—during the time Mr. Stamm was in Egypt—the plague disappeared entirely, and has never since returned. Here is a fact respecting the prevention of a disease which is worth a thousand speculative opinions. In hot climates, the neighborhood of swamps must always be subject to epidemics and the best remedy is one like that which has been carried out by Mehemet Ali, by which he removed the causes of a scourge which, upon several occasions, nearly depopulated Europe.

Engineer and Machinists Drawing Book.

A complete and reliable work on the draughting of machinery in all its details, and yet exhibiting a high style of art, is something which we have long desired to see in our country. This wish has at length been gratified by the completion of the above-named work of Blackie & Son, of Glasgow, Edinburgh, London, and No. 117 Fulton street, this city, (N. Y.) It embraces a complete course of instruction for the practical engineer, commencing with the use of the instruments, then proceeding regularly onward to the drawing of elementary forms, geometrical projection, simple machines, such as wheels, plates, beams, columns, rods, and all parts of machinery, and ending in complete compound machines, such as steam engines, &c. The plates are very numerous and fine, most of them being on steel, and as a handsome book, simply, it is worthy of a place in the library of every mechanic. It gives instruction in both linear and perspective drawing, shading, and coloring, and the plates accompanying the instructions are models of taste to copy from. The plates are large, on fine drawing paper, and are seventy-one in number. The letter press and wood cuts are also excellent, and the figures representing examples of finished shading are the finest we have ever seen in any work on the subject. We are confident that this book will form an important element in the education of our young mechanics, both as it regards improving their tastes and increasing the range of their acquisitions in correct mechanical drawing. The price of a bound volume is $10 50, in parts, unbound, $8; to be obtained at the above-named place, this city.

Iron Girders.

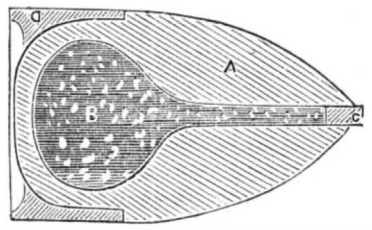
A trial of the Iron Girders took place at Trenton, N. J., on the 19th inst. The girders were 42 1-2 feet long, made by Bottom, Tiffany & Co. for a new store in Chesnut street, Phila., and were warranted to bear 50 tuns weight. They withstood the test of 52 1-2 tuns.

The United States Patent Office.

Every inventor should read and ponder the communication from Washington, signed "Inventor," relative to the Patent Office, which we publish in another column.

War Projectiles—New Shells and Cannon.

The war in Europe has created a perfect furor for new missles and machines to destroy the Russians by the Allies, and vice versa.—We have already published illustrations of the Russian infernal machines, to blow up the wooden walls of the British, and now we here publish a vertical section of a new patent explosive shell, by Bashley Britten, of London, which is intended to be used in common cannon, and do the job for the Russians in short order. This shot and shell has recently been patented, and has been described in the London *Times* and the *Mechanics Magazine*. The object of the invention is to increase the range and accuracy of the shot to be fired from cannon, by adapting the balls to be fired from rifled guns: also to provide for an explosive shot or shell, so made as to proceed always point first, and burst when it strikes, scattering destruction around. The form of the shell is conical, and it is inserted with its base towards the breech.



A is the body of the shell, which is of cast iron, with a hollow part, B, which is filled with an explosive compound such as percussion powder—the chloride of potassa and sand. It is ignited by an iron pin, *c*, placed snugly in the apex, which, when the ball strikes, ignites the powder by percussion force; or it may be ignited by a common fuse like a bomb shell. The cavity, B, renders the hind part of the shell of less weight in proportion to its size than the fore part, so that the center of gravity will be in front of its greatest diameter; this will keep the point, C, always in advance. D represents a coat or band of lead extending round the shot or shell as shown. On the ignition of the charge in the gun, the edge of the lead band, D, will be expanded, and fill the grooves of the cannon and prevent windage, and a spiral motion will be given round the long axis of the projectile.

The band of lead, D, is put on as follows:—The shell is scoured bright with dilute sulphuric acid and sand, at its butt, then washed in soft water, dipped first into a solution of salammoniac, and then into a pot of molten zinc. While the zinc is still hot, the shell is placed into a proper mold, and molten lead poured in to form the band, D. The zincing is first necessary to make the lead adhere to the iron. In a certain sense, this is the Minie ball principle applied to cast iron shot for cannon. The ball is of cast iron, with a lead band, to adapt it for the grooves of the gun, and to make cannons shoot accurately, with greater range, and at the same time obviating the grinding and rapid wearing action of the iron ball on the metal of the gun. The fitting of lead bands to cannon balls, to prevent windage, and to adapt them to grooved guns, and give greater range and accuracy, is not a new idea. Experiments with such balls were tried long ago in this country. Explosive shells of the same character are not new either. We know they were tried at West Point, and also at Fort Hamilton, ten years ago. What is new about this shot is its Minie character in forming the expanding band. This appears to us to be a good improvement, for which Mr. Britten deserves credit. Shells of this character were projected with a range of 1000 yards more than solid shot, and only two-thirds the charge of powder, and were more accurate in aim.

The London *Times* describes a recent war projectile by a Captain Disney, which has been tried at Chelsea. It is thus described:—"A shell is fitted with a bursting charge of powder contained in a metal cylinder, and filling the rest of their space with a highly combustible fluid, which, upon exposure to the air, ignites everything with which it is brought in contact. This fluid does not act upon the substance of the shell, is not in itself explosive, and being prevented from leaking by a nicely fitted brass mouth plug, enables the missile to be carried about without much risk.

Directed against ships or houses, or masses of troops, the new projectile would have all the destructive properties of the rocket, without its uncertain aim. Water only temporarily extinguishes its incandescent power, which is so great as to make even woolen materials burn with a quick flame. Capt. Disney also states, that by a similar use of another chemical fluid, he can cause blindness for several hours to all troops coming within a quarter of a mile of its operation; but this portion of his experiments was, for obvious reasons, omitted."

Such shells were described in our last volume by a correspondent, who proposed filling them with camphene, or some such combustible fluid. Capt. Disney may have discovered some highly combustible superior compounds, but we are rather skeptical respecting his new chemical fluid, which, according to the *Times*, will cause blindness for several hours, to troops a quarter of a mile distant. This assertion in relation to the gallant captain, is something like "trying to pull the wool over the eyes of recruits."

The *Pennsylvanian* states, that a new wrought iron cannon of extraordinary strength, has been invented by W. Griffin, superintendent of Reeves, Buel, & Co's. Iron Works, of Philadelphia. It is stated to weigh only 250 pounds, and yet it has been charged with 3 lbs. of powder, and rammed with five balls on the top of it. It was fired 168 times in one day. Its length is 4 feet; its bore is about 2 1-2 inches. In spite of all the new terrific war machines and projectiles which have been brought forward in England and France during the past year, Sevastopol has now withstood a siege for nearly twelve months, and the only effective means of making advances on the works, appears to have been the old plan of *sap and mine*. The last news from Europe, by the *Baltic*, gives an account of the failure of the monster *wrought* iron gun of Nasmyth. The great mass of wrought iron required to form it, maintained its heat so long, as to return to its crystalline state, and thus destroy its fibrous character. Large wrought iron guns never have succeeded, although many of them have been made, and the success of Mr. Griffin's, mentioned above, may simply be owing to its being very small. If, however, superior light field pieces can be made of wrought iron—and we think they can—such should be used in preference to all others. It would be considered an act of foolishness to use cast iron for rifle, musket, and carabine barrels; why not for light cannon?

Physical Effects of a Bombardment.

A private letter, giving an account of the recent bombardment of Sweaborg, says that the men employed on the gun boats had, as is usual, their ears padded with cotton, and few cases of deafness are reported, but all employed experienced severe pain in the chest, and in two days some of the men had not recovered their voices. The mortar boats threw 1,000 tuns of shells!

Some of our cotemporaries state that peat is now being used for fires on the Worcester and Nashau Railroad, and with great satisfaction. Parties have purchased extensive tracks of peat moss, in the belief that it will supersede wood on some of the eastern railroads.

American Association for the Advancement of Science.—No. 5.—(Concluded.)

Eclipse of the Sun in May 26, 1854.—Professors S. Alexander, of Princeton, and J. Henry, of the Smithsonian Institute, were observers of this phenomenon at Ogdensburg, N. Y. Some account of these observations have been published already. Prof. Alexander said at the time of the first internal contact, when the cusps were approaching, each detached a drop which the advancing cusp soon caught up. Next came a view of the outline of the moon, seen by light extending from cusp to cusp. Then came a twilight quite bright near the edge of the moon; then came the edge of the sun, a slender broken line, like the mercury in a thermometer tube when the column is broken. Daguerreotypes of the sun, then taken, and others since taken, have a double image. It appears that the rays causing the secondary image underwent two reflections. And it results that the image from unreflected rays is negative or dark, while the secondary image was bright. May it not be that some such means may sketch the immediate vicinity of the sun? "London smoke" glass seems to take off the glare from a landscape so as to give great beauty to a photographic sketch.

Professor Henry said it is now settled that this red light comes from the edge of the sun, and can be seen only by the aid of peculiar colored light. But using a large Fresnel lens, and throwing the image two inches in diameter on wood, it took fire, and behold! in the smoke I saw the red flames of the sun as seen seventeen years before! And, strange to say, they were only visible in the glass which showed the red flame in the sun. When the eye becomes tired by gazing on bright white light, the flame of a candle is invisible through all other screens but that kind; in that it is crimson. It is probably a subjective color existing in the eye, and is the result of white light.

Salt Marsh Sods Useful.—Lieut. Hunt has made salt marsh sods serve a useful purpose at Fort Adams, the big fortification at Newport, where he is superintending some works.

The coarse sedgy grass found along the seaboard, especially on the New England coast, is the quality that was used. The sods are applied at Fort Adams for facing the breast-high slope of over 1,000 feet of battery crest. It has heretofore been found impossible to find any grass sodding which will stand on these slopes. After careful observation, there seems to be every reason to hope that these will perfectly meet the demands of this construction. On Fort Adams alone there is an extent of over two miles of such crest, whence its importance is apparent.

The same material was used for building a parapet of a fort at Gloucester, Mass., during the war of 1812.

On Winds.—Capt. Wilkes read a paper on this subject, and he approached it with diffidence. His views are original, and contrary to some opinions considered "established."

There is found to be a belt of heated water running around the world. The equator of heat lies mostly north of the equator, dipping only once south of the equator for a few degrees in the center of the Pacific. Temperature is the great destroyer of the equilibrium of the atmosphere. Franklin first discovered that a north-west storm began at the south-west. Trade winds have no connection with the rotary motion of the earth. Under the equator we find winds blowing from the west. Take the world over, there is more west wind than from the east. The south-east trade winds are entirely different from those of the north. Trade winds never blow home to the land—calms or monsoons intervene. In the Pacific the trade winds are much more irregular than in the Atlantic. The heated belt of water, the heated deserts, and the heated mass of water in the center of the Pacific, are the causes of trade winds. All of them rush toward the heated areas. The circulation of the atmosphere is not between the equator and the poles, but between the upper and lower regions of the atmosphere. When the trade winds pass the Andes they make a leap of 300 or 400 miles before touching the sea again, and in that space are the monsoons. When the sun is vertical the trade winds are fitful and squally, and not regular as the monsoons are. The and and the sea breezes are the illustration of all winds, and even of storms. Cold air will go to the warm, and never the warm to the cold. No return current was noted at the top of Mannahoa. The earth does not slip away from its atmosphere, as metereologists suppose. This is shown by the ascent of æronauts. Here he proved to the satisfaction of all doubters that the winds are not caused by the inertia of the atmosphere, letting the earth slip past it, which, if it made the wind, would make it blow 1,000 miles an hour. There are no rain-bearing winds. Vapor percolates or filters through the atmosphere, and travels against the wind. On a point of the western coast of South America in the rainy season it rains just five hours each day, and then clears off; and it takes the sun just about the same time to cross the Atlantic, and it seems to bring its daily supply of rain with it.

Iron.—J. D. Whitney gave the following interesting account of iron deposits. He said that there were scattered over the earth deposits of iron of peculiar character and extraordinary purity, and that the mode of their occurrence was also peculiar; they belonged to certain systems of rocks and were found only in those systems. The principal localities in which this iron occurred were Scandinavia, Northern New York, Lake Superior, and Missouri. In Sweden there was a single bed 700 feet in width by four or five miles in length. The deposits in Northern New York were not so extensive, but the Cleveland Iron Mountain in the Lake Superior country, rose to the hight of 1,039 feet above the lake, with a breadth of 1,000 feet, and was entirely composed of iron ore. Along its summit were numerous knobs 30 to 100 feet in hight, which were perfectly pure. There were numerous other mountains in Missouri which furnished equally pure ores. The ores thus found were almost always of two kinds, specular and magnetic. The specular predominated in Sweden, Superior, and Missouri, while the magnetic prevailed in Northern New York. In Superior the iron beds lay between trap and talcose slate; in Missouri porphyry was near; in New York it seemed to have been sedimentarily deposited in lenticular masses, and afterward subjected to metamorphic action; these all in azoic rocks. As the azoic periods were more violent in their action than later periods, it was probable that what was thrown up during those periods came from a deeper portion of the earth, and we might hence infer that there were great deposits of pure iron deep down in the earth.

Weights and Measures.—Prof. Bache, of the Committee on Weights and Measures, said that the world seemed to be growing riper and riper for the adoption of a uniform system. At the Exhibition in England this took a definite form, and an association was now being formed in England for the purpose of producing such uniformity. While we were distributing our weights according to the British system, they were taking steps toward a better one. There was also a committee on this uniformity at the Paris Exhibition. He would present the following resolution:

Resolved, That the Committee on Weights, Measures, and Coinage be authorized to communicate with other associations or public bodies, or with individuals, in regard to the attainment of permanent uniformity in weights, measures, and coinage.

Coal and Fossil Fishes.—Prof. Hall said that in the shales of the Hamilton group there were large accumulations of bituminous matter. He said also that he was convinced that about three-fourths of the Missouri and Illinois coal fields marked by Owen would have to be wiped off the map, and its place supplied by Silurian with its Pentamerus, oblongus, and other characteristic fossils. He had seen Lower Silurian and Upper Silurian fossils over large areas of Owen's coal fields. He supposed most of that coal to be outlayers resting in basins, and having no connection with each other.

Prof. Agassiz said that he might not for years have an opportunity of making known the results of his comparison of fossil fishes. The general result in regard to the coal measures was, that there were two very different kinds of fishes, one represented by the very metamorphic fragments now on the table, and identical in its character with that which Dr. Newberry had found in Ohio, and that of Glasgow, the other in Southern Illinois, whence Dr. Cassidy had sent him a number of fossils, were ten or twelve fishes, as many as were generally found in a water basin after fishing for one season. This fish found was identical in its character with that of Bristol in England. The two were as different as the fauna of the Baltic and Mediterranean and the Red Sea.

Remarks.—A greater number of papers were read at this meeting than at any previous one. We have only presented the leading features of some which we thought possessed most interest for our readers. Prof. Agassiz appeared to be the ruling spirit at the meeting; he exhibited a profound knowledge of almost every subject discussed, and it is flattering to him and our country, that he has refused the liberal offers from the Edinburgh University in Scotland to fill the chair occupied by the late Prof. Forbes, preferring to reside where he has such a new and wide field for future investigations. Our readers will have observed that most of the papers presented are more speculative than useful in their character, and it is to be regretted that too little attention is given to practical science.

The Committee appointed on reforming our weights and measures, we hope, will effect something; but when we consider how long the subject has been before the Association we are inclined to place it on the list of fogies. There seems, also, to be a kind of family aristocracy among some of its members, for at the meeting held at Cleveland, two years since, a paper was read by J. Brainard on the chemical formation of quartz pebbles, which was ordered to be printed but countermanded at the next meeting in Washington, while its author was absent. In fact, Mr. Brainard was snubbed, we think, in rather an arrogant manner by the old Dons, such as Prof. Bache, who should have a little more tender regard for the feelings of the younger aspirants (though they may be wrong) for scientific renown.

Prof. Dana, the retiring President, delivered a profound address on the Science of Geology, which will be published in the Transactions. The next meeting will be held at Albany, N. Y., in September, 1856.

Improvement in Government Firearms.

There is at Springfield, Mass., a very large and important establishment, carried on by the U. S. Government, for the manufacture of firearms. A large proportion of all that are made for the public service, come from there. The *Springfield Republican*, in describing a variety of improvements that are now taking place in the workshops and other buildings connected with the establishment, says that a new model has been fixed upon for United States muskets, and that in future all the Government firearms will be made agreeable to the improved pattern.

The improvement consists in substituting rifle muskets, for those of the ordinary construction. The Ordnance Department instituted, some time since, an extended series of experiments at Springfield, under the direction of Lieut. James G. Benton, assisted by the gunsmiths and machinists of the works; the results demonstrated important advantages in favor of the rifle barrel.

The great superiority of the new model or rifle musket, lies in its unerring accuracy, the far greater distance it will send its ball, its more severe execution, and the lighter charge of powder required. The following is a description of it, as compared with the former musket:—

A change from the smooth bore to the rifle; the length of the barrel is reduced from 42 to 40 inches; the exterior reduced, and the caliber from 0·60 to 0·58 of an inch. The barrel to have three decreasing grooves, with a front and rear sight brazed on, graduated from one to one thousands yards. The bayonet, ramrod, mountings, and stock are much improved from the old model, and the weight of the new arm completed is about 9 3-4 pounds, which is one-quarter of a pound lighter than the old model. The lock is changed to a front action swivel lock with the Maynard attachment, which will contain 60 primers. The lock will also answer for the common service cap if necessary. The ball is an elongated, hollow, pointed ball weighing 497 grains, which is about 60 grains heavier than the present round ball. The new model rifle requires but 60 grains of powder, which is 50 grains less than the present service charge of the smooth bore musket, 110 grains. Besides the musket, thus described, models of a fine rifle pistol, with 10 and 12 inch rifled barrels, of the same caliber as the rifle musket, 0·58 of an inch, have been prepared, with a false butt, which, by means of a hook and spring, can be instantly attached to the pistol, thereby making it a rifle carbine, which will fire with accuracy 500 yards. When detached from the pistol, the butt is suspended by means of a belt and swivel ring. This will be a very important improvement for the cavalry service. The pistol lock also embraces the Maynard primer.

The models, gauges, and alterations for the rifle musket, pistol, and carbine, necessary to adapt the machines and tools, are now in vigorous prosecution. Within the present month, three new engine lathes, an universal milling machine, a shaping machine and a tilt hammer, have been added, and two stock turning machines are in progress, which, with others will, in the course of the present year, make complete the operations connected with the full introduction of the manufacture of the new arms.

It has been found practicable to alter the barrels of the old muskets to the rifle style. Some of them have been so changed, and it is not improbable that all now on hand at the Armory,—some 255,000—will ultimately receive the improvement.

Maynard's Primer consists of a ribbon, on which a series of explosive wafers are arranged in a single row. At each rise of the hammer the ribbon moves and carries a wafer over the nipple, where it is discharged by a pull of the trigger. It is a very simple, convenient, and effectual apparatus. Guns fitted for this primer may be used either with it or with common percussion caps, as desired,—it involves no change of the nipple. We presume the invention has or will prove a fortune to the patentee, now that it has come to be officially adopted by our Government. The patent was granted to Mr. Edward Maynard, of Washington, D. C., Sept. 27th, 1845.

Railroad Accidents in England.

"We observe in the late English papers," says the N. Y. *Sun*, "accounts of no less than three serious railroad accidents in that country, occurring within two or three days of each other, and it is perhaps worthy of remark, in view of the comments of some of our newspapers on the late railroad accident at Burlington, that two of these cases, collisions too, happened on lines which have a double track of rails. In the first accident an express train ran off the rails, and the carriages were all precipitated down an embankment, where they mostly laid wheels upward. Several of the passengers were injured, but the marvel is how any of them escaped destruction.

In the second accident, the engine gave way, when another train approaching in the same direction ran into it. A scene of fearful confusion ensued. Sixteen persons were more or less injured.

In the third accident, a heavy excursion train, conveying about 1,000 persons, was overtaken and run into by a freight train. None of the carriages were broken, but several passengers were severely bruised."

[No satisfactory explanation is given of the origin of the first accident. The last two appear to have been the result of want of power in the brakes. With the proverbial caution and systematic arrangement of flag-men adopted on English roads, we think that the back trains must have been duly notified of their proximity to the cars in front.

Lighting Streets by Electricity.

The town of Deal, Eng., is shortly to be lighted by the Electric Light. A trial was lately made there preparatory to lighting the town generally with it. It was perfectly successful, and gave great satisfaction to the inhabitants. It is said to have a most transcendent and vivid appearance, and is a vast improvement upon the gas lights.

TO CORRESPONDENTS.

C. D., of Ohio—The steam will rise through the water just according to its pressure on the square inch, and no more. If boiling water be admitted into a vessel containing steam, it will sink to the bottom, because it is heavier bulk for bulk,—it therefore displaces the steam.

L. W. T., of N. Y.—Tinsmiths say there is no difficulty in cutting out elbows by the dividers, but your plan may be a superior one. We would like to see it.

F. V., of N. H.—On a good railroad, a horse will draw four tuns at the rate of four miles per hour, but we cannot tell how much a horse will draw on our common roads for eight hours, at that speed. On a good macadamized road he can draw 484 lbs.

J. S. S., of Conn—We are not aware of any patent in force for machinery to make fish hooks, nor for keeping the straw straight in a thrasher.

M. B., of Va.—Original designs for monuments would be the proper subjects of letters patent under the Act of Congress for the protection of designs, etc. Preserving the autograph and likeness of a deceased person is not new; it has several times been proposed, and it has also been carried into effect.

S. H.D., of Vt.—One of the objections to the use of book and paper-folding machinery, is the difficulty of discriminating between good and bad sheets. In hand-folding the bad sheets are thrown out, but in folding by machinery this very essential result cannot be attained. Your machine appears to be new and patentable.

R. B. O., of N. Y.—If we allow the fall to be 5 1-2 feet, and the area 400 inches of water, the amount falling in one second will be 26·12 cubic feet, the full power of which will only be a little over 16 horse, so we make it less even than you have done. There is a mistake somewhere.

J. T., of Ala.—Your waterfall will be about 25 horse power, as by your data 630 cubic feet falls per minute, and the hight is 21 feet. Allow one-third for friction and loss on a wheel. This is a good power, but are you not mistaken about the velocity of your water?

C. C. T., of Wis.—Percussion pills are made with percussion powder—chlorate of potassa—mixed with a little gum mucilage and glass dust. We do not know where you can obtain them.

H. T. R., of Mass.—The foregoing is also an answer to your question

J. M. C., of N. C.—The sketch of your atmospheric railway has been examined; it contains no new feature: on the St. Germain railway, in France, essentially the same system is in successful use, and has been for some years; it is too expensive, and therefore has not been adopted. The system of drawing the train up the incline, by means of stationary power, chains and pulley, is generally preferred.

V. N. M., of N. C.—The two models of your plow improvements have been carefully examined. A patent was granted to J. H. Foreman, in 1852, for a plow that fully covers the important features embraced in yours, therefore we cannot advise you to apply.

C. C., of Mass.—The celebrated patent for endless horse power, by the Wheelers, of Albany, N. Y., was extended on the 30th of June, 1855, for seven years.

E. B. W., of Ill.—A hardware store without a rod, affords no immunity from being struck with lightning. The rod must extend above the roof, and be a perfect conductor to the earth. The free muriatic acid in the chloride of zinc solution used for soldering, dissolves some copper out of the soldering iron. The same acid will dissolve copper as well as zinc, and it also dissolves the tin on the tool. Be sure and allow the acid to dissolve plenty of zinc, as a partial remedy.

D. W. W., of Ohio—The use of caustic soda to purify oil is not new, and no patent could be obtained for it alone, but the combined mixture appears to be new, and a patent ought to be granted for it, if the product is superior to sperm oil.

N. B. O., of Canada West—There is no patent in existence here for a center discharge wheel containing six issues—the number of issues is not a patentable point.

R. G. H., of Miss.—We think that a patent could be taken out in the name of a slave if he were the inventor. The form of the oath would have to be modified. Address Stringer & Townsend, 222 Broadway, for the book.

J. R. S., of S. C.—We sent you the list of prices for artists materials a few days since, by mail. We do not know where you can get patterns for theorem painting. Address E. & G. Blunt, 179 Water street, New York, for Nautical Almanac.

G. & W., of N. C.—You should not fail to sign your names to every communication sent to this office. The sketch of your hay preserver has been examined, and we think it is novel—send us a model.

J. B. Reynolds, of Copreras Hill, Vt.—Is now investigating the science of mechanical sucking, and wishes to communicate with G. W. S., who first broached this interesting subject.

F. B., of Canada—It is only on your side of the line that newspapers are carried by the mails postage free; we are obliged to pay as much postage as ever to get the papers out of the States by mail. Uncle Sam, we admit, is behind Uncle John at this time on his mail system. It should be the policy of every free government to extend the broadest privileges towards the dissemination of knowledge through the press, and one of the best systems to accomplish this would be to abolish the postage tax upon newspapers entirely, and it must be done.

W. M., of N. Y.—It will not be necessary to have your patent ante-dated. If your claim interferes with Mr. B s. invention, you can have an interference declared, for the purpose of testing the question of priority.

J. J. W., of Ill.—We are not acquainted with Hay's work on harmonious coloring, and do not know where it can be had.

D. T. J., of N. Y.—The sketch of your alleged improvement in paddle wheels has been examined. We have never seen a wheel possessing the same features entirely, but we have no faith in its practicability. We do not think it capable of bearing up against the immense concussion to which it would be subjected. It might answer very well for the smallest sized boats, but it could not be made strong enough, unless made too heavy, to stand 50 revolutions in a tolerably rough sea.

J. C., of S. C.—As you do not furnish us with your residence, we are not able to answer, by mail, your letter of the 10th inst. You had better send us a model of your gin saw. The sketch is incomprehensible.

J. G., of Canada West.—See illustration of Carpenter's new patent rotary pump in No. 31, last volume of our paper.

A. W. H., of Mo.—The only way for you to get the missing number of the dictionary is to write to D. Appleton & Co., 343 Broadway, who are the publishers. $6,40 received; all right.

G. W. R., of Iowa—For an improved system of making shot, see page 32, Vol. 5 Sci. Am.—Smith's patent—which has been in successful use for some time in this city.

J. J. W., of Tenn.—We are not acquainted with any plan to bleach leather that will not injure its texture, still, we think it may be done.

R. E. Johnston, of Eutaw, Alabama, wishes to get a machine for shaving shingles.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Sep. 22, 1855:—

H. & R., of N. Y., $250; D. H. D., of Me., $10; H. C. G., of Wis., $30; B. J., of Pa., $30; H. F. P., of N. Y., $50; B. E., of N. J., $30; H. M. P., of N. J., $30; M. R., & Sons, of Pa., $30; W. A. K., of N. Y., $30; D. E. R., of Mich., $25; W. P. W., of Pa., $350; W. P. D. E. S., of Pa., $30; W. H. W., of Pa., $25; L. S., of N. Y., $25; J. H., of O., $30; W, S., of N. Y., $30; B. G., of Vt., $25; P. V. W., of N. Y., $25; J. K., of L. I., $30; R. D. N., of N. H., $5; J. M. T., of Pa., $30; R. McM., of N. J., $55; J. J. J., of Mass., $20; H. W. C., of Mass., $30; J. P. C., & others, of N. Y., $30; L. J. W., of N. J., $30; J. S. L., of Mass., $30; A. K. C., of Ct., $25; A. K. P. W., of Mass., $25; T. H., of O., $25; C. L., of O., $25; W. S. J., of R. I., $20; A. D., of Ill., $30; W. A. McD., of N. Y., $30; A. C. P., of N. Y., $30; A. L. B., of N. J., $30; C. J., of N. Y., $30; D. & S. J. G., of Va., $25; G. W. B., of Ct., $30; J. B. D., of Tenn., $20; H. & M., of O., $30; S. T., of Ind., $25; T. S., of N. Y., $12; W. R., of N. Y., $25; S. & C., of Pa., $25; Z. G. B., of Ill., $25; L. B. & H. B. M., of O., $30; S. B. W., of O., $55; G. A. P., of N. Y., $250; H. B. H., of O., $30; D. A., of Canada, $100; R. G. R., of Ct., $25; H. N. S., of Ct., $30; O. V. R., of Ill., $30; W. H. F., of Ky., $30; A. H. of Va., $30; W. D. H., of Mass., $30; I. F. B., of Ga., $25; G. L., of N. Y., $25; J. S. S., N. Y., $25; V. S., of N. Y., $55; A. M. G., of N. Y., $25; E. M., of Ill., $25; S. & S. M. C., of O., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 22nd:—

H. F. P., of N. Y., (2 cases;) L. S., of N. Y.; I. F. B., of Ga.; S. A. H., of Mass.; D. E. R., of Mich.; C. W. R., of Pa.; B. G., of Vt.; J. H. G., of Ky; C. L., of O.; G. L., of N. Y.; J. S. S., of N. Y.; T. H., of O.; P. V. W., of N. Y.; D. & S. J. G., of Va.; R. D. N., of N. H.; V. S., of N. Y.; A. M. G., of N. Y.; W. R., of N. Y.; S. & C., of Pa.; S. T., of Ind.; E. M., of Ill.; H. N. S., of Ct.; D. W. C., of Ct.; R. McM., of N. J.

Important Items.

Back Numbers and Volume—The following numbers and volumes of the Scientific American, are for sale at this office, at the annexed prices:—Volume VI., Vol. VII, Vol. IX, and Vol. X, complete. Price, *bound*, per Volume, $2,75. Numbers in sheets, complete, $2. Of Volumes IX. and X., we have also about 40 numbers each, not consecutive, which will be sent by mail on reeeipt of $1.

Receipts—When money is paid at the office for subscription, 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.

Binding—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. rice of binding 75 cents.

Science and Art.

Lime and its Use in Cities.

"The streets need lime now as much as in June, if not more, for having had no rain lately, the gutters give out a noisome effluvia."

Then why would you use lime? To make them give out more effluvia! for that is the effect of lime upon any putrifying substance. It hastens its decay, and unless there is something to absorb the effluvia, it will be given off into the atmosphere, to be breathed by human beings.

What is needed is something to absorb and solidify these noxious gases that arise from the sewers and gutters and other places where filth decays and poisons the air with its effluvia. For this purpose one bushel of chloride of lime is worth more than a whole cartload of carbonate of lime. Its use would not only be more beneficial, but more economical. Plaster of Paris or sulphate of lime is another form in which lime should be used as a disinfectant, because it absorbs ammoniacal gases, such as arise from water-closets, smelling like spirits of hartshorn. Pulverized charcoal is another powerful absorbent of all noisome effluvia, and worth far more to scatter in gutters than carbonate of lime; so is copperas, and so are a dozen other substances, yet the authorities use lime, and everybody cries out, "Why don't they use more lime?"—[New York Tribune, 17th Sept.

[Our criticism is, that the lime used for gutters in streets is not the *carbonate*, as stated by the *Tribune*, but the *hydrate* of lime, (Ca. O. + H. O.) an oxyd of lime and water. It is a good absorbent of carbonic acid and sulphuretted hydrogen, very offensive gases, which are continually arising from decaying organic matter in sinks, gutters, and sewers.

The carbonate of lime is limestone, marble, and shells. These, when submitted to heat in a kiln, are deprived of carbonic acid, and become the oxyd of lime, capable of combining with water, and becoming the hydrate of lime. It should always be employed in as fresh a state as possible—that is, soon after it is slacked. The great fault which we find with those who put the lime in our gutters, is, that they use old slacked lime which has already absorbed considerable carbonic acid from the atmosphere. The chloride of lime, (hypochlorite is meant), is, however, a better disinfectant than lime; and in this the *Tribune* is right, but the reasons it gives for the action are not good. It is simply lime and chlorine gas, and it is the latter which gives it superiority, by its quality for destroying miasmatic gases containing hydrogen. Plaster of Paris, charcoal, and copperas are all good disinfectants, as stated by the *Tribune;* but its attack upon common lime, mistaking it for carbonate of lime, is out of place.

Making a Sea of the Arabian Desert.

Captain William Allan, of the British navy, has published a book advocating the conversion of the Arabian desert into an ocean. The author believes that the great valley extending from the southern depression of the Lebanon range to the head of the Gulf of Akaba, the eastern branch of the head of the Red Sea, has been once an ocean. It is in many places 1,300 feet below the level of the Mediterranean, and in it are situated the Dead Sea and the Sea of Tiberias. He believes that this ocean, being cut off from the Red Sea by the rise of the land at the southern extremity, and being only fed by small streams, gradually became dried by solar evaporation. He proposes to cut a canal of adequate size from the head of the Gulf of Akaba to the Dead Sea, and another from the Mediterranean, near Mount Carmel, across the plain Esdraelon, to the fissure in the mountain range of Lebanon. By this means, the Mediterranean would rush in, with a fall of 1,300 feet, fill up the valley, and substitute an ocean of 2,000 square miles in extent for a barren, useless desert; thus making the navigation to India as short as the overland route, spreading fertility over a now arid country, and opening up the fertile regions of Palestine to settlement and cultivation.

The conception is a magnificent one, but no sufficient survey has been made to determine its practicability or its cost.

A Novel Experiment in Locomotives.

At the Boston Locomotive Establishment, Harrison avenue, a twenty-two tun passenger locomotive is building as an experiment. In the generation of steam in the engine, coils of pipes are placed one upon the top of the other, which contain the water, and upon which pipes the fire is directly brought. It is intended to burn coal, and it is thought steam can be made in ten or twelve minutes from the time of kindling the fire. Another novelty is that the engineer is placed ahead of the smoke pipe. The fireman is to be placed behind the boiler. It is also stated that whether the idea of burning coal in this engine succeeds or not, wood can be used at one-half the running expense of other locomotives—but this requires experiments to prove.

GRAHAM'S PATENT WRENCH.

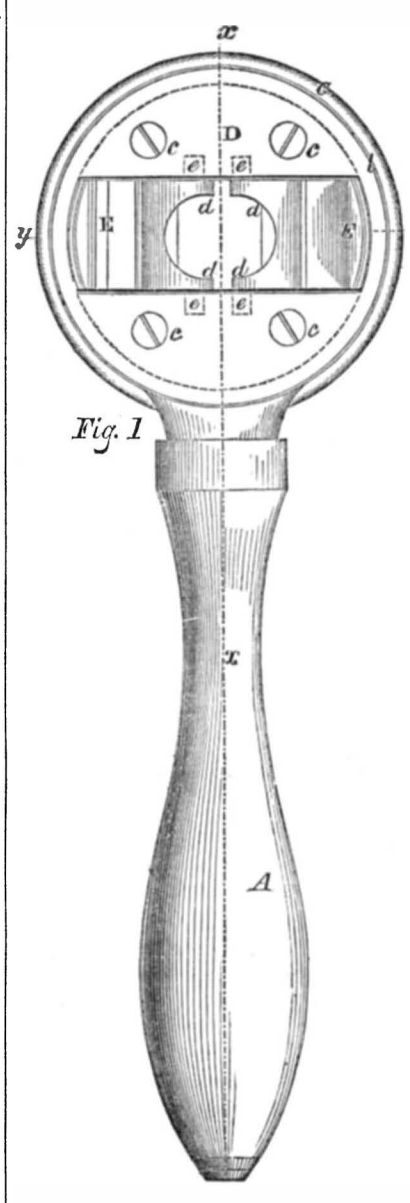


Fig. 1

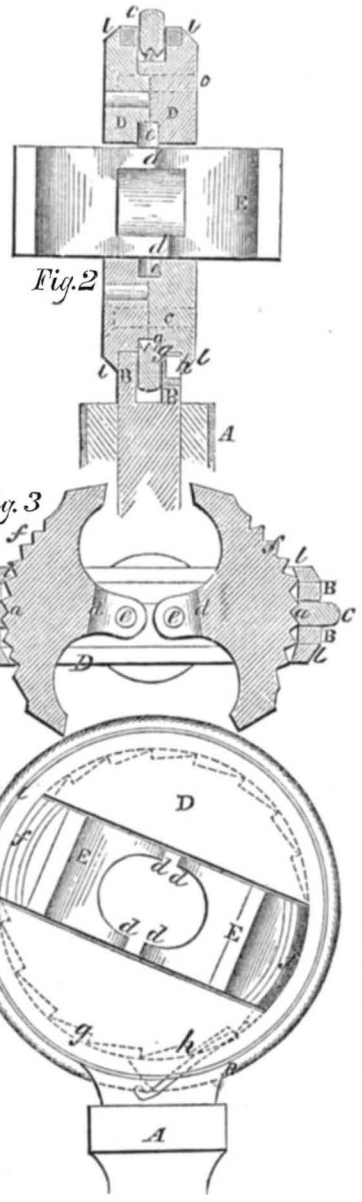


Fig. 2

Fig. 3

Fig. 4

The accompanying engravings represent the Improved Wrench of Alden Graham, of Roxbury, Mass., for which a patent was granted on the 7th of last month, (August, 1855.) Fig. 1 is a side view of the improved Wrench, fig. 2 is a view of it taken at *x*, fig. 1, showing the plane of section; fig. 3 is also a section transverse to fig. 2; and fig. 4 is an external side view of fig. 3. Similar letters refer to like parts. The nature of the invention consists in operating two jaws, which work or turn on pivots in circular plates by means of a ring or band, which has a screw thread cut on its inner periphery or edge, the ring or band encompassing said plates, and the screw thread working between threads cut on the outer sides of the jaws. A represents the handle of the implement, constructed of either wood or metal, and B B are two annular clamps, which are secured to the end of the handle, a space being allowed between them to receive a ring, C, which has a screw thread, *a*, cut in its inner edge or periphery, as shown in figs. 2 and 3. D D are two circular plates, which are fitted within the clamps, B B. These plates are each provided with a flanch or projection, *l*, which fits on or over the outer sides of the clamps, the two plates being secured together within the clamps by screws, *c*. The inner surfaces of the plates, D D, are in contact, and a slot or opening is made through the centers of the two plates, in which two jaws, E E, are fitted transversely with the plates. The jaws have each projections, *d*, on their inner surfaces to which pins, *e*, are attached, and these pins fit in recesses or holes in the plates, D D, as shown in figs. 2 and 3, and by dotted lines in fig. 1. The jaws, E E, work or turn on the pins, *e*, and the ends of the jaws project outward at equal distances at each side of the plates. The outer sides of the jaws, E E, have screw threads, *f*, cut in them. The "pitch" of the threads, *f*, of course corresponding to the screw thread, *a*, on the inner edge or periphery of the ring, C. The screw thread, *a*, of the ring, C, works between the thread *f*, of the jaws, E E. One of the plates, D, has ratchet teeth, *g*, cut in its edge, and a pawl or spring, *h*, is attached to the inner edge of one of the clamps, said pawl or spring catching into the teeth, *g*, as shown in dotted lines in fig. 4.

Operation.—By turning the ring, C, the jaws are operated, either end of the jaws being made to grasp the nut or other article to be turned, and the handle A, may be moved in one direction without turning the plates, D, and jaws, E, as the pawl or spring, *h*, will slip over the teeth, *g*, on the plate, D, but when the handle is moved in the opposite direction, the pawl or spring, *h*, will catch against the teeth, *g*, and cause the plates, D, and jaws, E, to turn with the handle. Thus a nut may be screwed up without taking the wrench from it at every stroke or movement of the handle.

The jaws E E, by being operated as shown may be firmly held to the article to be turned. The tool is convenient to operate, and is well adapted for large work, or where considerable power is required, as it can be made very strong and durable, much more so than the ordinary screw or other wrenches.

More information may be obtained by letter addressed to Mr. Graham, the patentee, at Roxbury, Mass.

Lieut. Maury is organizing a system of Meteorology on land, for the benefit of farmers on the same general plan as that employed for navigators.

To Prepare Nitrate Ammonia.

Dilute aqua fortis with three or four parts water. Put this into a porcelain or earthern dish (enamelled iron kettles answer well), and set it in a sand bath or hot ashes. Then throw in pieces of carbonate ammonia until it ceases to effervesce. Continue the evaporation until about two gallons of the solution is exhausted, or until a drop readily shoots into crystals on being placed on a piece of glass. Then set the dish aside until the crystals are formed. If the solution is evaporated slowly and with a gentle heat, and the vessel in which it crystalized has a broad, flat bottom, the crystals are very beautiful, long, shining, triated prisms. If the solution is exhausted nearly to the point of crystalization while it remains hot, and if this is done with a higher heat, it either shoots into small fibrous crystals or concretes into a shapeless mass. H.

A company has been formed in England for the manufacture of paper from the stem of the plantain. A good paper for printing upon, and a very superior kind as a wrapping paper, it is said, may be made from this weed.

A young American 18 years of age, named G. W. Heard, of Boston, in company with a young Englishman, J. A. Chapman, 17 years of age, have made the ascent of Mount Blanc.

A Rare Drawing.—An original draft of improvements in the machinery of the old steamer *Claremont*, by Robert Fulton, has been preserved among the papers of the West Point Foundry since 1808.

Literary Notices.

Magazines Received—The National Magazine—by Carlton & Phillips, 200 Mulberry street, New York. A capital number is issued for October, enriched with editorial notes from Europe, also various other articles of interest. Arthur's Home Magazine, for October, has some illustrations and articles of interest. It is a very nice work, and is popular in the homes of our people.

Coachmaker's Magazine—This Magazine for Sept., contains two plates illustrating carriages, phætons, &c., besides some good wood-cuts of inventions connected with carriage making. The articles are good and ably written. Editor and proprietor, C. W. Saladee, Columbus, Ohio.