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New Printing Press.

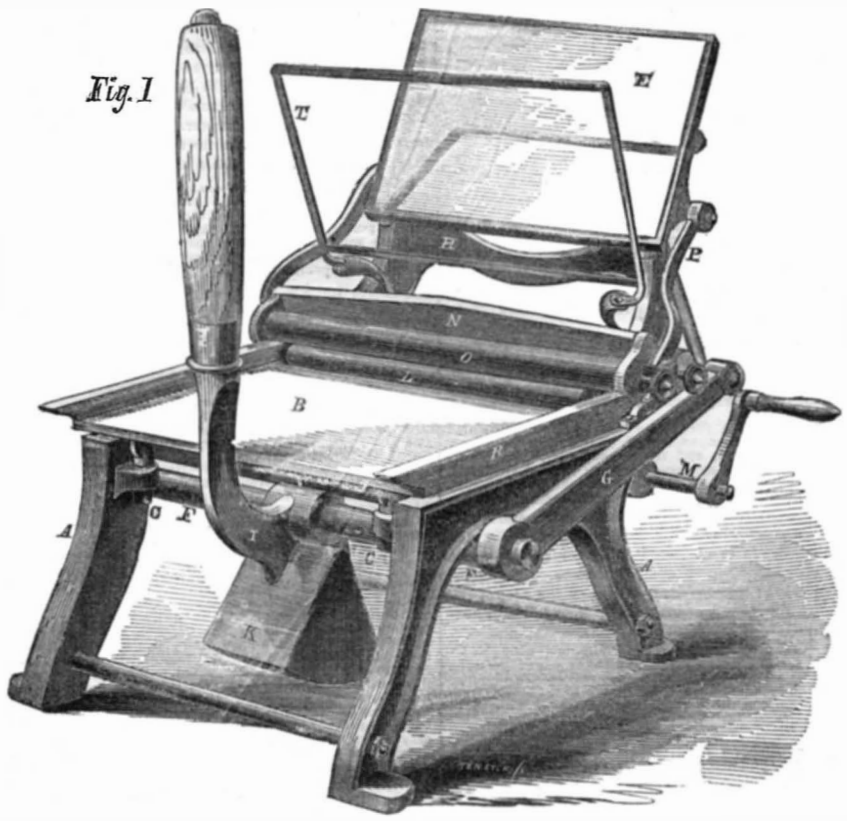
The accompanying engravings represent different perspective views of an improvement in printing presses, invented by J. H. Utter, a practical printer in this city, and for which application for letters patent, is now pending. Too much importance can hardly be attached to any improvement in the "art preservative of all arts." This invention is not of a class designed to expedite what may be called rapid power printing; but to render easier and faster the operation of what is ordinarily termed a hand-press, or one in which the motive power is entirely manual. It is well understood that hand-presses produce the best work, and that fine wood engravings, and the like, when it is necessary to give them the best possible effect, are always worked on some form of this species of press.

Those familiar with the operation of the common hand-presses, will readily appreciate the importance of this improvement, on learning that the whole operation of rolling the form, flying the frisket, folding down the tympan, moving the bed, and producing the impression, is, with this press, performed by a single movement of the lever or handle I. A is the frame, and B the stationary bed on which the form is supported. C C are screws which serve to regulate the height of either side or the whole of the bed, to produce a perfectly even impression, or to balance any preponderance of type or engraved face which may offer more resistance to the impression on one side than the other. D D are centers, to which are rigidly hinged the platen E, the face of which carries the blankets, which serve their usual purpose of softening and equalizing the impression. F is a stout shaft mounted in suitable bearings beneath the bed. G G represent stout levers, keyed on each extremity of F. H represents a casting which acts as a toggle lever, to transmit the force of the impression to the platen. I is a stout handle fixed on F, by which the motion is imparted. K is a heavy mass, cast on I, and which serves partially to balance the gravity of the other parts. L is an ink distributing roller, mounted in fixed bearings, and which receives both motion and ink, from other rollers, actuated (when commencing to work) by giving a few turns to the crank M. N is a light frame, in which are mounted the soft inking rollers O. The frame N is connected to the platen E by the links P, and is free to travel across the bed on the side bearers R, whenever such motion is imparted by the movement of E. S is a shaft, mounted nearly in the axis of motion of E. It carries a light frisket, I, which is impelled by a coiled spring shown in Fig. 2, into tolerable vigorous contact with the face E, so as to confine a sheet thereon, in the usual manner, by covering its edges.

Fig. 1 represents the press in the proper position to receive a form of type on the bed B, and to receive a sheet of paper on E. The frisket T is held away from the face of E, by its contact with a fixed stop, not represented. On imparting a downward motion to the handle, the arms G are elevated, and through the medium of the casting H, the platen E is moved forward, clasping the paper between itself and T, and descending into contact with the form, on the bed B, when it assumes the position represented in Fig. 2. Meantime, the links, P, have pushed the frame N, and with it the inking rollers O, across the form, and laid the ink thereon, in the usual manner. The final termination of the downward motion of I acts, as will be observed, from the position of the parts in Fig. 2, at a great purchase, so

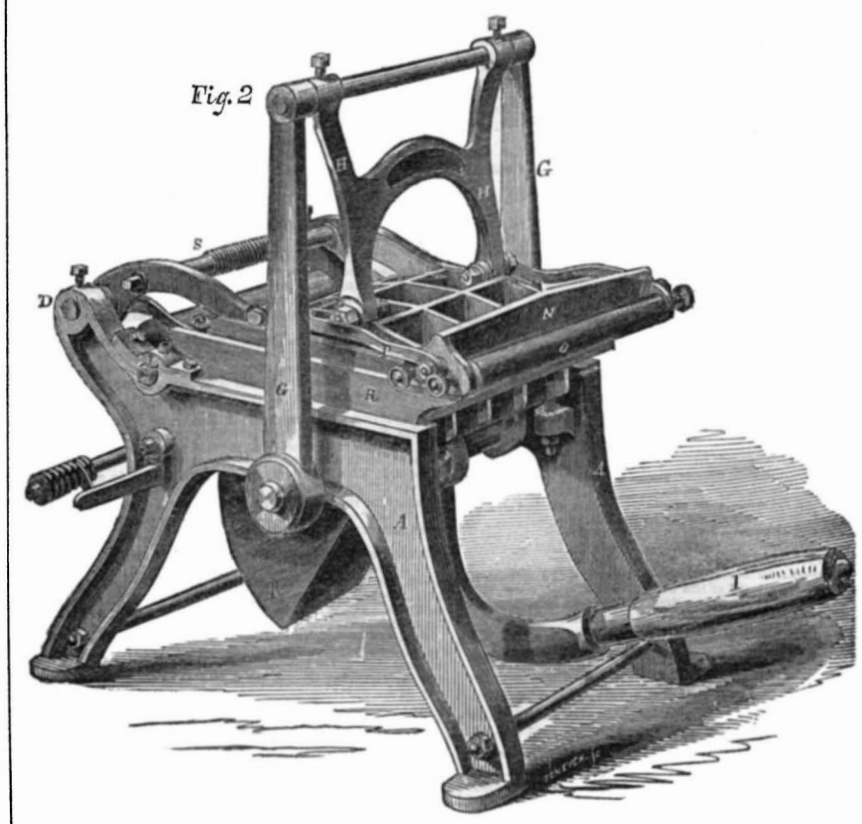
UTTER'S PRINTING PRESS.

Fig. 1



as to produce a very powerful impression on the form. On lifting I, all the motions are reversed, the levers G move backward, acting on H, to elevate the platen E, and while these parts are returning to their places, the rollers O are drawn again across the form, inking it for a new impression. As the platen E recedes into the position represented in Fig. 1, it leaves the frisket T in the position indicated, and allows the printed sheet to be readily

Fig. 2



removed, and another to be substituted in its place. It will be observed that the inking rollers O, which are two in number, are compelled by the motion of N to travel twice across the form—once, as the platen is brought down, and again as the platen is elevated—so that the types are liberally and uniformly inked as by the ordinary arrangement, and the whole operation is conducted not only rapidly and easily, but with a very high degree of perfection. By means of a simple device, not distinctly represented, motion is imparted to the distributing apparatus M L, at each movement of E, so that the crank M does not require to be touched after the operation of printing is fairly commenced, and is only employed to give a suitable distribution of the ink at the commencement. We have seen the press in operation, working very rapidly. There are many points in this machine, among which may be mentioned the ordinary axial motion of the rollers, &c., which being common to all of the best presses, we have not deemed it necessary to describe. As a whole, the press appears highly efficient and durable, and we predict for it a quite extensive use for printing all moderate sized jobs. For further information the inventor may be addressed at No. 9 Spruce street, this city.

The Benefits of Machinery.

The *British Workman*, a periodical devoted to literature as connected with mechanical pursuits, contains in its number for the past month a very able article on improvements in the "pottery art," in which it very graphically sets forth the benefits conferred upon workmen by improved machinery. It says:—

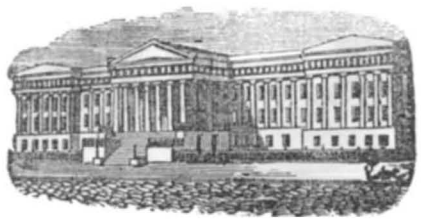
"Time works many changes both in men and things, and the last thirty years have shown not a few instances which at the time were regarded by the working classes as *injurious*, have, in the course, of time, been found to be 'blessings in disguise.' Within the recollection of many persons, horses and even hand power were in use at the Lambeth potteries for crushing the clay; and the potters all used wheels, called 'kickers,' which were turned by the foot. When Mr. Green determined to introduce the new wheel into his manufactory, *the whole of the workmen struck*. All the men left, except one, who was allowed to continue at his kicker until his death, a period of fifteen years. He earned 30s. a week, while the man with the improved lathe, who sat next to him, earned double that sum. So much quicker could the potter work at the new wheel than the man at the kicker, that he could make as many stoneware ink bottles for 6d. as the other could throw off by his machine for 1s. 3d. Since the day of the kicker the number of men and boys employed at Mr. Green's pottery alone has increased fivefold. What strikes and riots were witnessed in Lancashire and Yorkshire in bygone years on the introduction of power looms and other machinery. Shortsighted policy said—'These will injure the working classes, and reduce the number of hands employed.' The result, however, has been very different from what the desponding and faint-hearted dreamed of. Those very inventions which were regarded with such bitter hostility, have, in the providence of God, been the means of extending the commerce of our nation to an extent previously unknown.

The old kickers could not possibly have supplied the present demand for pottery, neither could the old hand looms have produced one-half of the cloth now required for the clothing of the people. Men and women are now employed by tens of thousands in the weaving mills throughout the manufacturing districts, and they can produce far more work and earn better wages than under the old system. What was thought to be a national evil has proved a national good."

Iron Churches.

Iron churches, 70 feet long, 40 feet wide, and 20 feet high, capable of accommodating 700 persons, and costing about $5000 each, have been erected recently in the neighborhood of London. They are lined with wood, and papered. They can be taken down and moved to other locations, if desired. Although more iron houses have been built in New York than in other city in the world, we have never heard of an iron church having been erected in any of our cities.

We learn from the *Lake Superior Journal*, of the 20th ult., that there was plenty of ice in the Lake on that date. This has been the most backward season on record.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JUNE 30, 1857.

FOUNTAIN LAMPS—Henry W. Adams, of New York City: I claim providing the burner cup with an internal cylinder or lining, E, to leave an open bottomed, but close topped passage, a a, around the burner, in communication with the tube or passage, D, coming from the fountain or reservoir, said internal cylinder or lining being provided with an opening, c, opposite the tube or passage, D, substantially as and for the purpose specified.

[This improvement has for its object the prevention of the overflow of oil at the burner cup when the lamp may be carried carelessly and tilted, also the prevention of oil running down the outside of the lamp. The sides of the burner cup are extended above its cover, to form a receptacle for the oil that may flow over when expanded by heat—useful improvements.]

SMELTING FURNACE—Charles C. Alger, of Newburgh, N. Y.: I claim an improved furnace constructed substantially as described, that is, with its hearth or crucible and boshes of an elliptical or elongated form, substantially and for the purposes as specified, in combination with two mouths—one at each end for working and tapping—and two or more tweers at each side, so arranged as to introduce the blast in the direction of the breadth, and for the objects explained.

MAKING BOLTS AND RIVETS—Joel R. Bassett, of Cincinnati, O.: I claim first, The clamps, e f d r t, constructed substantially as described, and arranged on the periphery of a rotating stock in such manner as to be readily accessible for inspection and replacement, in combination with the friction roller, p, for the clamping and releasing of the bolt or rivet.

Second, In combination with the above, the yielding rest, i j, and divided cutter, k l, by means of which the rotation of the clamp stock severs the blank, the end of the rod being contracted during the act of separation, and afterwards released by the retraction of the rest and cutter, i j k.

Third, The arrangement of heading dies, s, and adjustable stationary cam, n o, in comb nation with the clamps and the perpendicular face of the plate, l, substantially as and for the purposes set forth.

MACHINE FOR RIVETING BOILERS—Sylvester Bennett, of New Orleans, La.: I do not claim of itself the employment of a set or tubular punch, to close the metal around the rivet before the riveting operation, when such set is uncombined with the riveting punch or other devices, by which the upsetting or heading up of the rivet is effected, and has to be removed before the said punch or other device can be operated, as such sets are used in riveting by hand.

I claim the employment, in combination with a riveting punch or plunger of a hollow set, fitted to slide upon the exterior of the same, and operated to close or set the metal around the rivet before the operation of the punch or plunger commences, and hold the same closed during such operation, substantially as described.

[This invention relates to the construction of boilers by steam power, and consists in fitting to the exterior of a plunger for riveting, a tubular die, to serve as a "set" to close the plates to be riveted together in making boilers, &c. When a rivet is inserted in a hole that has been punched for it in the plates, steam is admitted under the piston of the set, and the latter is forced upon the metal surrounding the rivet, and exerts a great pressure; the punch is then brought into action, by steam pressure, on the point of the rivet, and completes the operation of riveting.]

IRON PAVEMENTS FOR STREETS—Geo. W. Bishup, of Brooklyn, N. Y.: I do not limit my claim to the use of all the features of my invention in connection, as good results may be obtained by the use of some of them without the others; but the best results will be obtained when all the parts are used in connection.

Nor do I limit myself to the making of the blocks of a quadrangular form, as other forms, such as the hexagonal may be substituted, although I prefer the quadrangular form.

I do not claim paving streets with blocks of cast iron.

But I claim making cast iron paving blocks with a series of transverse draining grooves, substantially as described, which when completed and laid will form grooves running from the middle of the street towards the side gutters or sewers, as set forth.

I also claim forming the surface of iron paving blocks with a series of inclined planes and shoulders, substantially as described, to prevent horses from slipping, while at the same time carriages will roll over the surface without serious impediment or concussions.

And I also claim the said series of inclined planes and shoulders, in combination with the lateral grooves for draining, but which also answer the purpose of preventing horses from slipping, as set forth.

And finally I claim the manner of uniting the iron blocks in laying a pavement, by the alternating over and underlapping of the series of blocks, substantially as described, whereby the blocks are enabled to sustain one another, and thereby more effectually maintain the required grade.

MAKING PAPER—Edward B. Bingham, of Brooklyn, N. Y.: I do not claim to be the first inventor of agitators for moving the fibers of the pulp, and thus causing them to inter-weave.

I especially disclaim the employment of spiral agitators, as in Marland's patent.

I claim the employment or use of the endless aprons, C, one or more placed within the pulp vat, adjoining the cylinder, B, for the purpose set forth.

[This improvement relates to the cylinder paper machine, and consists in the employment of an endless apron, placed at each end of the cylinder, and close to it, and having a traversing motion to that of the cylinder. The apron lays the pulp like a cross lap on a web of cotton batting, thereby rendering the paper made by such machines much stronger and more difficult to tear, while at the same time it is of a more uniform texture. An excellent improvement.]

BLAST BLOWER—John Brough, of Aurora, Ill.: I claim the wind or blast wheel, constructed of the circular plates, b b, having openings, h, made through them, and provided with hoods, i, the plates having a bucket or piston, d, one or more secured between them, when the wheel thus constructed is fitted within the fan box, A, constructed in the form of a scroll, substantially as described, for the purpose set forth.

[This fan blower is provided with two circular plates, having a bucket secured between them, and each plate has curved openings in it. These plates and bucket form a blast wheel, and are placed within a scroll-shaped box, and so arranged that a good blast is produced when they are revolved; this blower is very easily operated.]

GAS BURNERS—Asa D. Gates, of Binghamton, N. Y.: I claim attaching to the top of, or slipping over, the usual burner, the conical or cylindrical supplemental chamber burner, as and for the purposes set forth.

MAKING HORSE SHOES—Henry Burden, of Troy, N. Y.: I do not claim the process of passing the shoe between the revolving dies generally, but limit myself to the particular devices by which I have rendered it practical.

First, I claim the described feeding apparatus, and in connection therewith the mode set forth of cutting off the rod; also the self-acting device for stopping the feeders, and the mode of renewing their action at the proper time.

Second, I claim the mode of bending the rod and placing it in its proper position between the swaging dies as described.

Third, I claim the flange on the upper swaging die, for the uses and purposes specified.

Fourth, I claim the combination of the revolving, creasing and punching die with the revolving swaging dies, by which both operations are successively and automatically performed.

Fifth, I claim the devices set forth for taking the shoe from the upper and confining it to the lower dies, and finally taking it from the lower dies and conducting it to the flattener.

Sixth, I claim also the means described for flattening the shoe.

Seventh, I claim the combination and arrangement of machinery by which the several processes described are performed successively by one machine, and without aid from attendants.

I do not mean to limit myself to the precise means for performing the operations set forth, as they evidently admit of several variations.

But I claim those devices or their equivalents which shall substantially effect the same purpose.

STEAM RADIATOR FOR HEATING APARTMENTS—J. H. Chester, of Cincinnati, O.: I do not confine my claim to gas as the only means of heating the portable radiator, but intend to use any method of heating to secure the object as set forth.

I claim the portable radiator, A, constructed with plain inner surfaces, the deflector, B, boiler, C, and tube, D, all constructed and arranged substantially as and for the purposes set forth.

DISTRIBUTING APPARATUS OF FLOURING MILLS—Alfred T. Clark, of Lancaster, Pa.: I am aware that a single series of spouts has been connected with a bolt, as in the patent of E. & J. M. Clark, patented June 6, 1854. I shall not therefore lay any claim to this device, but limit my claim to the double series of spouts and valves, so arranged in connection with the bolt and open conveyor, A, as to give me facilities for separation and mixing not attainable by a single series.

I claim as my improvement on the mill of E. & J. M. Clark, patented June 6, 1854, the double series of spouts and valves, arranged and connected with the bolting chamber, substantially as set forth.

I also claim the arrangement of the conveyor, A, in combination with the double series of valves and spouts, as set forth.

WHIFFLETREE HOOK—Anthony Cooley, of Paw Paw, Mich.: I claim providing the outer extremity of the hook socket, A, with an open slot, C, and spring seat, D, and fitting the feather spring, F, and the shank of the snap, G, in the same, substantially as and for the purposes set forth.

Second, I claim furnishing internally each of the cheek pieces of the open slot, C, of the hook socket, A, with a scroll slot, H, and the snap, G, with two short journals, I, and fitting these journals in said slots, and holding them in place by means of the feather spring, F, substantially as and for the purpose set forth.

[This is a neat, simple and useful device, and apparently superior to anything heretofore contrived for confining the trace to the whiffletree, because it has no springs or projections exposed for dirt to collect upon; and by simply pressing the thumb upon the snap of the hook, the trace can be instantaneously detached or confined.]

EARTH EXCAVATOR—Curtius Colby, of Wilson, N. Y.: I do not claim the mounting and using an excavator upon wheels; nor suspending its sides upon pivots or gudgeons; neither for escape of the earth by letting the bottom free, as I am aware of there being machines used with those principles.

Neither do I claim the method of elevating the excavator by the cog wheels, C and D, acting upon the drums, H H, or the chains attached thereto; nor the method of varying the direction of the machine by the tiller, K.

But I claim first, The use of the levers, E and F, with their combination, for the purposes set forth.

Second, The suspending the arms, S S, to the frame at a point, P, above the level of the top of the excavator, thus securing the elevation of the hind as well as the fore part at the same time.

Third, I claim causing the return of the bottom of the excavator to its proper position for reloading by means of the strap, I, and roller, L, as described.

UTERINE SUPPORTERS—W. E. Cooke, of Philadelphia, Pa.: I do not claim the pivoting of the bars, B B and E E, together at the points, c r.

But I claim first, The manner of uniting the bars, B B and E E, to each other and to their pads respectively, through the intervention of the side or hip bars, C C, so that the truss and supporter may not only be adjustable, but also self-adjusting to the person or body of the wearer as set forth.

I also claim in combination with the front pad A, an adjustable pessary, made and operating substantially in manner set forth.

GAS REGULATORS—John H. Cooper, of Philadelphia, Pa.: I do not claim the inverted cup spring and valve, as such are common to other gas regulators.

Neither do I claim broadly the hinging of the cup and valve to the interior of the casing.

But I claim the combination of the inverted cup, C, arm, D, and valve, H, when both valve and cup are attached directly and permanently to an arm hinged to the interior of the casing, substantially in the manner set forth and for the purpose specified.

HORSESHOE—Wm. Cooper, of Brooklyn, N. Y.: I claim the use of a metallic plate horseshoe covering the base of the hoof, having a suitable stopper fitting into a screwed opening in the same, or an equivalent therefor constructed in the manner and for the purposes substantially as described.

PRINTING INK—George Matthews, of Montreal, C. E.: I claim the use of the calcined green oxyd of chromium for making ink for printing from engraved plates, from types, or for other kinds of printing, as described.

VALVE GEAR FOR STEAM ENGINES—Sidney Maltly, of Dayton, Ohio.: I do not claim effecting the reverse and cut-off by having the wrist adjustable on a link or slotted arm, because with the first device great complication is necessary in order to produce the desired results, and in the second a like complication is necessary in order to effect the reverse and cut-off while running.

But I claim the means described for effecting the reverse cut-off and lead, when said means are arranged directly on the wrist of the engine crank, and used as a substitute for the common link and hook motions, substantially as and for the purposes set forth.

[This invention is one of great importance, as it dispenses entirely with the complicated link and hook motions usually employed for effecting the reverse of the engine and cut-off and lead of the valve. The improvement consists in the direct attachment of the adjusting devices to the wrist of the engine crank, said devices being used as a substitute for the link or hook motion.]

RAKING ATTACHMERT FOR HARVESTERS—John McIntosh, of Geneva, Ill.: I am aware that endless aprons and sliding plates have been frequently employed on harvesters, for the purpose of discharging the cut grain from the machine, and I therefore do not claim the employment or use of such separately or in themselves considered.

But I claim the peculiar method described for withdrawing and releasing the sliding plate C, when the same is used in combination with the endless belt, B, in the manner and for the purpose set forth.

[This raking attachment is automatic. It consists of an endless apron, combined with a reciprocating discharge plate. The cut grain falls on the apron, and is gathered towards the discharging plate, and at every revolution of the wheel this plate is drawn out by a cord attached to a hub, and the gavel of cut grain falls. A spring then forces the plate back into place, ready for another operation. It can be set to gather gavels of different sizes.]

HARVESTERS—D. S. McNamara, of North Hoosick, N. Y.: I do not claim the lever E, for that has been previously used, and is quite a common device for raising and lowering the sickles of harvesters.

But I claim connecting the shaft i, by means of the arm, K, and link, l, with the rod, F, placed at the underside of the draught pole, C, and connected with the yoke ring, substantially as described for the purposes set forth.

[This is an improvement in means for adjusting the sickles of harvesters, whereby a sickle may be conveniently secured at the desired hight from the ground at the will of the driver to pass over obstructions. The device for executing this object is very simple, and by merely backing the team, if the cutter should become clogged, it can be instantly raised.]

FENCES—James Moore, of Pittsburg, Pa.—I do not claim the use of wire or other metallic wire as being new in the construction of fences.

But I claim the use of lozenge-formed slats, and the alternate twisting of the wires between the slats as herein described, and for the purpose set forth.

FRAME FOR COMBINED MOWERS AND REAPERS—J. A. Moore and A. H. Patch, of Louisville, Ky.: We do not claim making the rear and outer end of the frame in one piece; nor do we claim the indiscriminate use of "angle iron."

But we claim making the rear and outer end of the frame of a combined mower and reaper of a single bar, E, of angle iron, when said bar E is bent into the form, and united to the frame bars, A A' C, and to the finger bar, D, and shoe, F, as described, and shown in the drawings.

[This improvement consists in the peculiar construction of the frame of the machine, whereby the platform for securing the cut grain may be readily adjusted to the frame when the machine is to be used for a grain harvester, and this frame offers no obstruction to grass when this machine is used for a mower. This construction is of angle iron, and also possesses the advantage of protecting the shoe at the point of its union with the finger bar.]

CHILLING PLOWSHARES—James Oliver and Harvey Little, of South Bend, Ind: We claim the process described, consisting in placing the surface of the chill in such a position in relation to the other parts of the mold that the melted metal shall first come in contact with the chill at the edge of the share, in the manner and for the purpose specified.

ELASTIC LOOP FOR BEDSTEAD SLATS—Chas. Robinson, of Cambridgeport, Mass.: I claim an elastic self-attaching loop for bedstead slats, substantially as specified, as a separate article of manufacture not heretofore known.

STREET LANTERNS—John Reese and C. N. Tyler, of Washington, D. C.: We do not claim the conical aperture or the valve in themselves,

But we claim the arrangement of the funnel-mouthed aperture D, and the valve, F, in the bottom of the lamp, substantially as and for the purposes set forth.

PRESERVING GREEN CORN—David Rowe, of Baltimore county, Md.: I claim the art and process of preserving green corn in the ear, by extracting the pith or heart from the cob, and seasoning and drying the inside of the cob as rapidly as the outside for preserving the virtues and juice of the grain, and preventing the collection of mold or corruption, as described, and for the purposes set forth.

FIREARMS—Jacob Shaw, Jr., of Hinckley Township, Ohio: I claim, first, The combination and arrangement of the trigger with the cocking ratch and hammer, whereby the force of the main spring will cause the trigger to continue its motion in a backward direction after it has been forced back to a certain point, and the introduction of the hair trigger as described, whereby the trigger may be arrested when it has reached that point, and the hammer by this means be held at the cock point, or by a simultaneous action of a force on the hair trigger in a backward direction, the backward motion of the trigger may be allowed, and a consequent disengagement of the hammer be produced to effect a discharge.

Second, I claim the combination and arrangement of the trigger with the rotator ratch and locking lever, and the revolving chambered cylinder or block, whereby this block is revolved and locked from the front, substantially as set forth and described, instead of the usual mode of the ratchet wheel and pawl in the rear, intending and designing hereby to claim each part and all the parts named in the above claims in connection with each other, without intending to limit myself to construct them in the precise form set forth and described in the specification or of any particular dimensions, but intending to reserve the right to vary them as I may deem expedient, while I attain the same ends by means substantially the same.

FARM GATES—Wm. Sherwood, of Beloit, Wis.: I claim the use of the crank, M 1, M 2, in combination with the latch N, or its equivalent, and the weight, W, for the purpose of opening and shutting a sliding gate E', in which arrangement the gate E' is opened by one-half revolution of the crank M', and shut by the other half resolution of the same; the latch N stopping the crank, M' M 2 at the end of each half revolution, and the whole being set in motion by a weight, W, which may be wound up when necessary like the weight of a clock.

I also claim the arrangement and combination of the lever Z, and the connecting rods, Y 2, Y 3, with the two parts of the gate E 1 and E 2, by means of which one part of the gate E 1 when moving in one direction opens or closes the other part of the gate E 2, by a corresponding motion at the same time in the opposite direction as described.

BRAKE FOR WAGONS—Hugh Slater, of Auburn, N. Y.: I claim the peculiar arrangement and combination of devices by means of the tongue or pole, a a, the hinge b b, the V shaped connection, c c c c, the brake rod or bar, D D, and the connections with the brake arms, substantially as described.

I also claim the combination of the pole or tongue, a a, and stop-bar, o o, with the sliding bar, D D, or its equivalent, whereby the stop is raised when the carriage is backed, and lowered when it is moved forward, substantially as described

MORTISING MACHINE—H. B. Smith, of Lowell, Mass.: I claim, first, The adjustable compound treadle, H, when used in combination with a mortising machine for the purpose, and substantially as described.

Second, The pawl, K, or its equivalent, in combination with the table, B, to prevent the action of the chisel from jarring the foot, not intending by this to confine myself to the exact form represented, but adopting any other substantially the same.

CARTRIDGES—Gilbert Smith, of Buttermilk Falls, N. Y.: I do not claim generally the packing of the joint between the barrel and the breech by the expansion of a cartridge case of soft metal, nor the construction of a cartridge case so as to be retained in the chamber after the discharge.

But I claim making the cartridge case, or, at least, the cylindrical portion thereof, of india rubber cloth or vulcanized india rubber, so that though entering loosely into the chamber by confining it within the chamber, it may be expanded laterally by the force of the explosion of the charge against a joint between the barrel and breech made near the middle of the chamber to close the same hermetically, and (unlike metal) may after the explosion contract itself by its own elasticity, so as to admit of its being easily withdrawn from the chamber by the fingers of the operator, substantially as described.

[A portion of this cartridge case is made of india rubber cloth, or vulcanized india rubber, for the purpose of serving as an elastic packing by its lateral expansion consequent upon the explosion of the charge, and thus prevent leakage.]

RAKING APPARATUS FOR HARVESTERS—Daniel C. Smith, of Tecumseh, Mich.: I claim the mode of operating the rake of a grain harvester, by means of the mechanism described.

GAS GENERATORS—J. W. Smith, of Washington, D. C.: I claim the combination of the retort, B, with the partitions, F, when the said partitions are furnished with openings, i, arranged in such a manner that the oil or other fatty matter, and the gas produced by its decomposition shall flow through the retort in currents crossing each other, and alternately dividing and uniting in the manner described, and for the purpose specified.

HARVESTERS—Chas. T. Stetson, of Amherst, Mass.: I am aware that the finger and cutter bars of reaping and mowing machines have been variously attached, so as to conform to the irregularities of the ground, and I therefore do not claim attaining this end irrespective of the peculiar means employed for that purpose.

But I claim attaching the finger bar, C, to the frame, A, by means of the guides, i i, and the grooved segment guides, e, the inner end of the bar being provided with friction rollers, d, which are fitted and work in said segment guides, e, the parts being arranged substantially as described for the purpose set forth.

[This improvement relates to peculiar devices for raising and lowering the sickle and finger bar, and adjusting them more or less obliquely with the surface of the ground. The finger bar is also connected to the main frame in such a manner, whereby it and the sickle are allowed to rise and fall independently to a certain extent of the frame, to conform to inequalities of the ground.]

JOURNAL BOXES FOR SHAFTING, &C.—Daniel Taylor, of Carbondale, Pa.: I claim as a new article of manufacture a journal box or section of a journal box composed of a brass lining and an iron body, when the two are solidly united together by casting the latter upon the former, substantially as set forth.

DIE STOCK—James Teachout, of Waterford, N. Y.: I claim constructing the die holder, B, of the screw cutting die stock in the particular manner described, so as to give firm support to the inner portion of the top of the dies, as well as to their bottoms and sides, and thereby relieve the scroll and guard plates from all the upward strain or pressure otherwise exerted upon these plates by the inner portion of the dies in cutting screws.

COLORING YARN IN THE BOBBIN—James Thomson and W. P. Wakelee, of New Hartford, N. Y.: We are aware that a vacuum has been used to facilitate the admission of the dyeing material into the pores and around the fibres in the dyeing of cloth. We do not therefore claim the use of a vacuum for the purpose of dyeing generally.

We claim the use of a vacuum, in combination with our arrangement of apparatus to render the same available in the dyeing of yarn in the cop, bobbin, and the like, without first reeling it into hanks or skeins as described. The whole apparatus being constructed and operating substantially in the manner and for the purposes set forth.

SEPARATING OIL FROM STEAM—Robt. Hale, of Roxbury, Mass.: I claim the described apparatus for separating oil from steam, operating in the manner substantially as set forth.

HARVESTERS—Henry D. Hammond, of Batavia, N. Y.: I claim the shaft, p, with arms, o s and q, relatively attached thereto as described, in combination with the swinging flanged supporting bar, B, and the journaled cutter and finger bar, l, connected with arm o, when said parts are arranged for joint operation in the manner and for the purposes described.

ADJUSTABLE FENDER POSTS FOR SAW MILLS—Henry Harpold, of Racine, O: I claim first, The fender posts arranged in two parts and adjustable, secured together by hook bolts, and working on a pivot on the fender beams, all operating in the manner and for the purpose set forth.

Second, I claim the jaws and blocks attached to the saw sash and working on a swivel arranged with the adjustable fender posts, for the purpose of giving the saw pitch, and making it follow a desired curve, as set forth.

HARVESTING MACHINES—John K. Harris, of Allensville, Ind.: I claim imparting to the cutter bar of harvesting machines a uniform reciprocating motion, by means of the duplex drive wheel, K K', when used in combination with the rocking pinion, L, said wheel and pinion being geared by means of alternate and oblique sets of cogs, k k' l l', in the manner set forth.

ELECTRIC TELEGRAPHS—Harrison G. Dyar, of New York City. Patented in England Feb. 3, 1851; I do not claim any particular mode of obtaining the synchronism of the vibrations; nor confine myself to vibrations or any particular form of motion to produce the like effect; nor the use of any particular means for obtaining the electric action; nor the kind of signals, signs, marks or recording; nor particular modes of arranging the apparatus, leaving it to those who use my invention to employ such apparatus, whether vibratory, rotary, or oscillatory, as they may deem best suited to accomplish the object desired under the different circumstances which may arise.

But I claim constructing and operating signalizing telegraphic apparatus in such manner that electric pulsations representing signals, resulting from the actions of two or more operators at work at the same time, are imparted alternately and successively to a single main conductor or wire of communication, and received therefrom and distributed in the same alternating succession, whereby a single main conductor may be made the instrument by which two or more operators can be simultaneously employed in sending different messages, either in the same or in opposite directions, substantially as set forth.

I also claim transmitting different electric signals, resulting from the actions of two or more operators working at the same time, at the same or opposite ends of a single main conductor, by means of a single main conductor combined with two or more sets of corresponding signal-sending and signal-receiving conductors, which represent the different signals in use, and are appropriated to different operators by means of intermediate circuit-making and circuit-breaking apparatus, which are moved in harmony at the signal-sending and signal-receiving-stations, in such manner as to present themselves successively in all the positions required to permit currents of electricity to be passed alternately through the corresponding members of the signal-sending and signal-receiving conductors, whereby the apparatus at each station can at the same time be employed in transmitting and receiving signals representing messages, substantially as set forth.

I also claim transmitting electric pulsations to a main conductor, and distributing them from the same main conductor by two sets of circuit-making and circuit breaking apparatus, which are moved in harmony with each other, but are moved by the mechanism independently of the other portions of the telegraphic apparatus, in such manner that the harmonious movement of the circuit-making and circuit-breaking apparatus at either end of the main conductor is not impeded or controlled by the irregular movement of other parts of the telegraphic apparatus.

I also claim sending and receiving signals, as stated, by apparatus so arranged and combined with the main conductor that in operating, the impulse that closes or opens the circuit shall last but for a moment, while the contact maintained at the station where the shall is received shall last a longer period, so as to signals the necessity of exact synchronism in the movements of the mechanism at the two stations.

SEWING MACHINES—Elias Howe, Jr., of Cambridge, Mass., and Wm. R. Bliss, of Boston, Mass.: We claim first, In connection with the mode of forming a seam by means of two threads, as described, we claim the seizing and holding of the loop of the needle thread after it is inserted, by means of the point, c, of the shuttle and finger, V, or their equivalent, and the withdrawing of the needle from the material to be sewed before the shuttle thread is passed through the loop, substantially in the manner and for the purpose described.

Second, We claim the combining and arranging of the mechanism which works the shuttle thread and the baster, or its equivalent, with the standard, C, and in connection therewith so arranging the mechanism which works the needle thread as that they shall co-operate and form the seam when the standard is inserted in objects of a tubular form, as described.

CARRIAGE TOP—R. S. Jennings, of Waterbury, Ct.: I claim the hood or attachment constructed of the jointed bow, A, provided with the screen or apron, C, and provided with loops, f, at its upper part, and tenons, e, at its lower part, and applied to the top as shown and described, for the purpose set forth.

[This improvement consists in providing a screen of prepared cloth attached to a folding bow and applied to a carriage, whereby the carriage seat may be conveniently and easily enclosed, and the occupants of the carriage completely sheltered when caught in a storm of rain.]

PERMUTATION LOCK—Frank G. Johnson, of Brooklyn N. Y.: I claim the combination together of the tum-

blers, 1111—using two or more of said tumblers—with the exterior pins, n n n n, and the pins, n' n' n' n', with the springs, s s s s, the bolt, E, and locking latch, G, substantially as set forth.

METALLIC PACKING FOR STEAM PISTONS—Daniel Lasher, of Brooklyn, N. Y.: I do not claim metallic springs intervening between the piston and the packing rings.

But I claim the manner described of constructing the bent or folded metallic springs, to take an even and extended bearing on the inner side of the packing ring or rings, when provided with the lips or projections, 2, to keep the springs properly in place, substantially as specified.

IRON TRUSS FRAMES FOR BRIDGES—Francis C. Lowthorp, of Trenton, N. Y.: I do not desire to confine myself to the precise form of straining plate described, as the same may be adapted to receive a greater or lesser number of lower cord rods, or to any description or number of diagonals and verticals.

But I claim the straining plate, B, in combination with the rods, G and H, when the latter are connected to the plate, substantially in the manner set forth, and when the said plate is arranged to receive the vertical or verticals and diagonals of iron truss frame bridges.

SELF-ACTING RAKES FOR HARVESTERS—S. T. Lamb, of New Washington, Ind.: I claim, in combination with a rake having the motions described, the gyratory beam, M, and the rock shaft L, when the rake is attached to said rock shaft as shown, and the whole operates in the manner set forth.

I also claim in combination with a rake operating as above described, the slotted guide g, for regulating or governing its motions, when combined with the beam M and shaft L, as set forth.

I also claim, in connection with a rake having the motions described, the combined use of the spring K, for holding it to its work, and the set screw m, for regulating the extent of descent of said rake, substahtially as set forth.

SAWING MACHINE FOR FELLING TREES—Matthew Ludwig, of Boston, Mass: I claim the combination of the vibrating radius, with the pitman I, and saw stack, M, for the purpose of guiding and rocking the saw circularly in its own plane, substantially as and for the purpose set forth.

[This machine is simple and well adapted for sawing down the giants of the forest. It requires but a small amount of power to operate, as the saw is arranged to move over friction rollers, and in its movement back and forth rocks circularly in its own plane, and is thereby caused to take hold of only a small portion of the diameter of the tree at a time]

COMPOUND FOR COVERING HAMS—Carter Van Veeck, of Macomb, Ill.: I claim the described composition for covering hams and other provisions, or other bodies, for the purpose of preserving them from decay or decomposition, consisting of rosin, gutta percha, and tallow, in the proportions substantially as specified.

[This composition is rendered liquid when heated, and is easily applied; and, when cool, it makes a most complete air and water-tight coating for preserving hams, and other animal substances from decay by exposure to the oxygen of the atmosphere. High testimony to its utility and efficiency has been given by persons of long experience in the meat-packing business, who have given it a thorough trial.]

STARCH FROM MAIZE—William Watt, of Belfast, Ireland: I claim the manufacture of starch from maize or Indian corn, substantially as set forth, by steeping the whole or uncrushed corn in water heated to a temperature of from seventy to one hundred and forty degrees Fahrenheit's thermometer, such water being changed several times during the steeping, or applied in continuous or intermittent streams, and then grinding or levigating it with water heated to a temperature of from seventy to one hundred and forty degrees of Fahrenheit's thermometer, and then separating the starch as described.

CONDENSING LIQUIDS IN GAS MAIN PIPES—John Walton, of Louisville, Ky.: I claim the employment substantially as described at any convenient place or places in the gas pipes of one or more vessels or receptacles containing alcohol or other hygrometric agent, for the purpose specified.

[This is a useful improvement for remedying a great evil with which those who burn gas are too well acquainted, namely, the choking of gas pipes during winter by severe frost. This evil is caused by freezing the moisture carried off by the gas into the pipes. The improvement consists in placing vessels containing alcohol, or other agent having a great affinity for water, in such situations as to absorb all the aqueous vapor in the gas, before it enters the service pipes for distribution to consumers.]

SLIDE VALVES FOR STEAM ENGINES—Thomas Winans, of Baltimore, Md.: I claim the connecting of the passages through the ends of the main valve, denominated the Meyer's valve, by the channel or opening described.

DEFECATING CANE JUICE—Leonard Wray, of London, Eng. Patented in Belgium, June 20, 1854: These comprise the whole of my treatment, and I submit that they constitute an entirely distinct and new process, being one whereby excellent crystalized sugar has been, and can always be, made from the plants I have before named; and I therefore claim the process set forth.

LOCKS—Ludwig Baier (assignor to Joseph Lippincott and Wm. C. Barr), of Pittsburg, Pa.: I claim, first, The sliding tumbler box, E, carrying the tumblers, e e, which by the sliding motion of the box are brought into contact with the bits of the key, when arranged and constructed substantially as and for the purpose described.

Second, The three armed "follower" C, when arranged, constructed, and operating on, and in combination with, the tumbler box, E, bolt, B, and tumblers, e e, with their slots, n n, substantially as and for the purpose set forth.

I am aware that bit plates of various shapes are used, and a well known device, but the same have been in all cases simple. I do not claim these, but what I do claim is, the key, H, when constructed so as to form a double bit plate, and operating on the tumblers in the manner substantially as described.

SHIPS' CAPSTANS—Robert Dunbar and John F. Robertson (assignors to the Buffalo Eagle Iron Works Co.), of Buffalo, N. Y.: We do not claim giving a variable movement to the capstan, irrespective of the particular means employed for effecting the purpose, for capstans have been so arranged as to have a variable movement.

But we claim the arrangement of the cam, j, and eccentric, h, upon the shaft G, operated by the lever, i, for throwing in and out of gear the pinions J and I, as set forth.

[This improvement has for its object the imparting of a variable movement to a capstan, so that it may be operated either by a quick or slow motion, as required; this is accomplished in an effectual and simple manner by a peculiar arrangement of the device claimed.

AUTOMATIC RAKE FOR HARVESTERS—Joseph S. Manning, of Philadelphia, Pa.: I claim the described raking device, consisting of cross bar 1, teeth, 2 2 and 3, swinging bars, 4 4, and supporting roller, 5, when the same is used in combination with the peculiarly constructed platform, P P R R, in the manner and for the purpose set forth.

STRAP PILLOW BLOCK FOR SHAFTING, &c.—George H. Reynolds, of Medford, Mass (assignor to himself and D. B. Hinckley), of Bangor, Me.: I do not claim dividing journal boxes vertically, as this has been done before.

But I claim the described journal box, consisting essentially of the pieces of bushings, B B', and strap, B, constructed and operated in the manner and for the purpose set forth.

SEWING MACHINES—William Sage, of Durham Center, Conn. (assignor to Henry Sage), of Berlin, Conn.: I claim, first, Combining the spring stop plate with the needle, and loop former as described for the purpose set forth.

Second, Giving the point of the loop former an upward motion as the needle rises, and the point of the loop former expands to form the loop, substantially as described, and for the purpose stated.

Third, The construction of the loop former and its arrangement in connection with the trip, h, and slide N, by which it is made to open to spread the loop for the reception of the needle, and close to enter the next loop as set forth.

VALVES IN STEAM CYLINDERS—M. E. Stacy (assignor to W. John Way), of Flemington, Ga.: I claim the arrangement of valves in steam cylinders described, operating in the manner and for the purpose set forth.

CROSS CUT SAWING APPARATUS—Henry F. Wilson (assignor to himself and Henry B. West), of Elyria, O.: I claim the radius bars in combination with the vibrating bars for the purpose of straining the saw, so as to enable me to give the saw a reciprocating motion without guides.

Second, I claim placing pins, b c, at a greater or less distance apart than pins, d d, for the purpose of giving a rocking motion to the saw while reciprocating, said motion to be graduated according to the kind of wood to be sawed, the whole to be arranged, constructed, and operated in the manner and for the purpose specified.

RE-ISSUES.

PORTABLE FIELD FENCE—James G. Hunt, of Cincinnati, O. Patented Dec. 16, 1856: I claim connecting the panels or sections of a fence by the projection of one or more rails in whole or in part from one section or panel, beyond the slats or battens, and between the slats or battens of the adjoining panel, and supporting and locking the fence by compound triangular braces, substantially as shown and described and arranged with reference to the projection of the rails, or their equivalent keys, for the purpose specified.

LOOMS FOR WEAVING PILED FABRICS—Mertown C. Bryant, of Lowell, Mass. (assignor to E. B. Bigelow, of Boston, Mass.) Patented May 19, 1850: First, I claim the method of transferring the pile wires in series from the cloth to the shed of the warps, substantially as specified.

Second, I also claim the method of successively cutting the rows of loops or pile on the pile wires substantially as specified.

MACHINES FOR MANUFACTURING HAT BODIES—Jas. S. Taylor and Elijah Sturdevant, of Danbury, Conn., and as administrators of Hiram L. Sturdevant, deceased, assignees of Lansing E. Hopkins, of New York City. Patented Dec. 7, 1852: What is claimed to be the invention of Lansing E. Hopkins, is the method of felting hats by passing them or rolling them between the revolving endless planking table and a series of rollers as described, or their equivalents, whereby a vibrating, reciprocating, and forward motion is communicated to the hats, thereby working it up in a perfect manner. But this we claim only when the vibrating and reciprocating motion is communicated to the hats in the direction of the revolving motion of the traveling belt, so as to give the hats a rolling motion alternately forward and back as they pass through the machine.

Objections to Hollow Walls.

MESSRS. EDITORS—I do not agree either with you or your correspondents in your advocacy of hollow walls, for the following reasons:—

Such a wall must necessarily be weak, it has one vast joint pervading it from top to bottom, the occasional binding or heading bricks recommended not being sufficient to hold it properly together. The great crying fault of American houses (brick ones especially) is, that they are built too weak; this system would lead to still greater evils in this direction. The gable-end walls of ordinary dwelling houses are seldom made more than one brick thick, laid with six or eight courses of stretchers and one course of headers. As a general thing, the brick are now miserably laid as regards *strength;* the back joints are not regularly mortared, and the bricks are not kept wet during the process of building. Now if the hollow system be introduced, builders will still endeavor to construct the end walls as before, one brick thick, plus the hollow or space in the middle—in short, the wall will be built up in two distinct portions, each entirely of stretchers, with here and there a header, which will, of course, not come flush with the inside of the wall by the thickness of the space allowed in the center of wall; but no matter, they will fill this want with mortar, and when all is finished, who will be the wiser? The ordinary wall is weak enough in all conscience, but still there is some little adhesion between the face and back stretchers, independently of the header courses, as some of the mortar of the bed squeezes up and partially fills the back joint. In the hollow wall, there would of course be no cohesion at all beyond the few headers which might be introduced. In the case of fires, the present kind of wall, when the wood-work, which in a measure supports it, is burned, falls down too readily—then, what would be the chance of the hollow wall standing? We would have more firemen killed and wounded than there now are, though the number is great enough at present. An effort ought to be made to strengthen our walls, not weaken them, egg-shell and flimsey as they are.

Another reason why I object to the hollow wall is, that it forms a recepticle for vermin; it would be an intolerable nuisance to have rats and mice eternally *quadrilling* up and down these vertical *ball rooms.* Still greater would be the annoyance when they turned them into cemeteries.

And further, I think the hollow walls are not *needed at all, for the very reason why their advocates press their adoption,* viz., that they cause greater dryness in the house. The great fault of the climate on this continent is its great dryness and stimulating qualities. The evil has been much increased by the introduction of close stoves, and, above all, hot air furnaces, or heating apparatuses. I think that it would much conduce to the health of the people, if some measures were taken to make the air of rooms *damper* instead of *dryer* than it now is. When I advocate a moderate degree of humidity in the atmosphere, I would be understood as referring only to healthy moisture, not the foul exhalations from damp cellars, which people generally seem quite to ignore. Does any house improver want a *giant evil* to eradicate?—if so, let him attack *foul air.* There is one great necessary of life that we want in all our dwellings, that is scientific *ventilation.* ED. M. RICHARDS.

Lebanon, Pa., July, 1857.

[Our correspondent supports his first objection to hollow walls, by facts drawn from the bad workmanship of masons. This is a very poor foundation on which to build solid arguments for solid walls. If the hollow is better than the solid wall, it should stand upon its own merits, and not be condemned, because masons are in the habit of building miserable solid walls upon a principle, never advocated by us, to be applied to hollow walls. We have constantly referred to the construction of hollow walls in connexion with the use of the Flemish bond—(one header and one stretcher, succeeding one another in each row of brick)—and we do not wish to be held responsible for any other view of the question. He also objects to hollow walls, on account of their want of strength, assuming that they must be weaker than solid walls, composed of the same amount of material. We believe he is not correct on this point. Walls constructed with a row of headers to every two rows of stretchers, would be stronger than solid walls, and not so dangerous to firemen in cases of fire. The hollow wall would not be "one vast joint," as he states, but would be formed of a series of cells. It has been found that cellular hollow girders, made of iron, are stronger than those not cellular, constructed with the same amount of material. His objection to such walls, being grand ball rooms for rats and mice, is somewhat musical, and apparently he makes a good opera out of it, winding up, as he does, with the "dead march."

He also objects to hollow walls, because they are drier than those which are solid. The argument he advances is the super-dryness of our climate, which requires moisture to be healthy. This is a strange idea to advance. Every person knows that damp walls are unhealthy; they are frequently the cause of rheumatism and chills and fever. Every means which can be provided against such dampness in walls, should be employed, and if hollow walls afford a remedy, they certainly should be advocated, not condemned.

We are as strong advocates as he is for good ventilation, and have no doubt but he is right in his remarks respecting the want, generally, of the proper amount of humidity in rooms heated by hot air furnaces; but these are questions quite separate from that of "hollow and solid walls."

Natural Self-Printing.

A new era has dawned in the publication and historical representation of scientific objects by the introduction of natural self-printing. This is the most important discovery made in the art of printing since Guttenberg's invention, and the honor of it is due to Dr. Alois Auer, of Vienna. We will here describe the successive steps of this process. In order to obtain a copy from the original corresponding thereunto in its minutest details, be it a plant, a flower, an insect, a piece of cloth, or any inanimate object, we must proceed in the following manner: Place the object to be printed between a well polished copper plate and a lead plate, and then let the two plates pass between two cylinders moving parallel to each other. The pressure produced by the cylinders causes the original to leave a perfect picture of itself upon the lead plate. This lead plate needs no special preparation, but the common lead-plates sold in every tinstore will answer every purpose, if they are only smooth on one side. After being submitted to this pressure between the cylinders, the lead plate will no longer be perfectly flat, but slightly bent to the form of the cylinder; it must therefore be placed upon a smooth, hard surface, that its shape may be restored both through its own weight and a little mechanical aid. As soon as this is done, one or more copies can be taken from the plates, if it be charged with any colored fluid, and treated generally as any copper-plate form when you wish to get an impression. It is evident that the copies taken directly from the lead plate must be limited in numbers, as the soft lead cannot long resist this pressure, and soon becomes, in consequence, unimpressible. But to obtain a large number of copies the lead form may be stereotyped, or a galvanic precipitate thrown upon it to make a printing plate from which a proper form may be obtained. The lead plates only need to be subjected to the action of a smoothing cylinder to render them again fit for use, and the copper plates may also be used again. N. G.

[Our contributor has furnished us with some beautiful impressions of leaves, which were taken in the manner described.

Patent Case.

A case was tried before Judge Ingersoll, United States Circuit Court, in this city, on the 2d inst., relating to the machine for cutting moldings, patented by Alfred T. Serrell, May, 1848, re-issued patent June, 1853. An injunction was moved for against Collins & Pell, for infringing this patent. The motion was denied, and the case ordered to be tested by a trial at law, the plaintiff being required to establish the validity of his patent at the next term, before an injunction can be issued; but if the defendants are not then ready to try the case, an injunction will be issued against them without the trial.

Chloroform in Seasickness.

Dr. Landenen, a physician at Athens, informs us that he has discovered a specific for seasickness, viz.: ten to twelve drops of chloroform in water. He says the chloroform, in most cases, stops nausea, and that persons who have taken the remedy are soon able to stand, and get accustomed to the motion of the vessel. Should the sickness return, repeat the dose. This remedy was tried on twenty passengers during a very rough sea voyage from Zea to Athens, and all, with the exception of two, were cured by one dose. The minority (two ladies) recovered on taking a second dose.—*Medical Times and Gazette.*

Fish and Flesh as Food.

Now, when the price of meat is so high, it will not be out of place to call attention to the nutritious qualities of fish. Payen fed a dog on a mixture of 80 grammes of eels and 50 grammes of bread. On comparing the excrement with the digested food, he discovered that 85 per cent of the fat and 92 per cent of the nitrogen of the eel had passed through the intestines. Feeding him afterwards on bread alone, the excrement was found to be much poorer, containing less fat and nitrogen. After being fed on eels and mackerel the animal grew larger and fatter.

Lemon Juice in Dropsy.

Lemons are recommended for dropsy in a Russian medical journal, and are said to be beneficial in the most hopeless cases. The first day one lemon was given, after taking the peel off, and cutting it up into small pieces in sugar; the two following days three were given, and afterwards eighteen every day. For nourishment, meat was given. In every case the water came off on the seventh day.

Eggs for Burns.

The white of an egg has proved of late the most efficacious remedy for burns. Seven or eight successive applications of this substance soothe the pain and effectually exclude the burned parts from the air. This simple remedy seems to us far preferable to collodion or even cotton.

Lime in the Eye.

If quicklime gets into the eye, so as to darken the cornea by the lime penetrating the coating itself, the best remedy is water saturated with sugar.

New Inventions.

Use of Gold.

The principal use of gold is in coinage As a medium of exchange, it has been employed from time immemorial, and will perhaps be so used while the earth remains. Owing to its unalterable nature in the atmosphere, it is extensively used in covering more oxydizable, but cheaper metals exposed to the atmosphere, in the form of thin leaf, called *gilding*. It is now very extensively and usefully employed in the art of dentistry, in thin plating, for securing artificial teeth, also for filling decayed teeth. In the art of jewellery, it is the principal metal used; but this is not considered so much a useful, as an ornamental application of it. But we would term the beautiful, *useful* also, for certainly it is a beautiful metal, and the beautiful has always an elevating and therefore a useful tendency.

American Iron Steamer.

On the 27th ult., a beautiful iron steamer named the *Cecile* was launched at Wilmington, Delaware, built by Harlan & Hollingsworth, of that city. Her length over all is 161 1-2 feet, breadth of beam 29 feet, and by carpenters' measurement she is 481 tuns burden. She has two air-tight bulkheads; dining saloon 48 feet long; 24 state-rooms, two berths each; four state-rooms, four berths each, and a ladies' saloon on the main deck with eight berths. She will have a low pressure condensing beam engine, 38-inch cylinder, 10 feet stroke of piston, capable of working up to 490 horse power; will have composition balance puppet valves, and Sickles' adjustable cut-off. Her wheels are 24 feet in diameter; she will have an auxiliary locomotive boiler for working a steam pump. The *Cecile* is to be fitted up at Charleston, S.C., where she is owned by Messrs. Peck, Lafith & Co.

New Protector for Firemen.

The attempts which have been made to protect firemen from the injurious effects of smoke and heated air upon the lungs, by causing the air which they breathe to pass through moist sponge for the purpose of filtering and cooling it, have been but partially successful. The improvement here represented has for its object the accomplishment of the same end, and is based upon the fact that in apartments filled with smoke to an extent that would render it impossible to breathe at the height of a man's head above the floor, there is in nearly every instance a draft of cool, pure air near the floor.

To take advantage of this circumstance, a light-fitting mask has been adapted to the face of the person, from which depend air tubes, through which he breathes; the extremities of the tubes reach to within an inch or two of the floor, as will now be more fully explained.

The accompanying engravings exhibit a form of apparatus for this purpose, invented by I. P. Nelson, of Cambridgeport, Mass.

On Fig. 1, A is a front view of the mask, which conforms generally to the face of the individual, and is made of a sheet of prepared india rubber. The mask is contracted at its edges by an elastic band, by means of which it is caused to cling to the head, and all entrance of air or smoke at this point is prevented.

The tubes C are united to the mask immediately beneath the nose, and at this point there is an opening between the tubes and the interior of the mask, through which air is admitted for respiration. Immediately in front of the mouth, there is an opening, which is covered by the flexible valve B.

This opening is placed directly in front of the mouth, so that expiration may readily take place through it, while no air can be admitted at this point from the outside, as the valve B is of flexible india rubber, and effectually closes the opening when the air is exhausted upon the inside of the mask.

The tubes C reach to very near the floor, and are passed over the shoulders, and secured to the body and legs by straps, D, as seen in Fig. 2. It will be seen that a person thus equipped for entering an apartment filled with smoke, may inspire through the tubes C, taking the air from the lowest stratum in the room, and expire through the opening at the mouth.

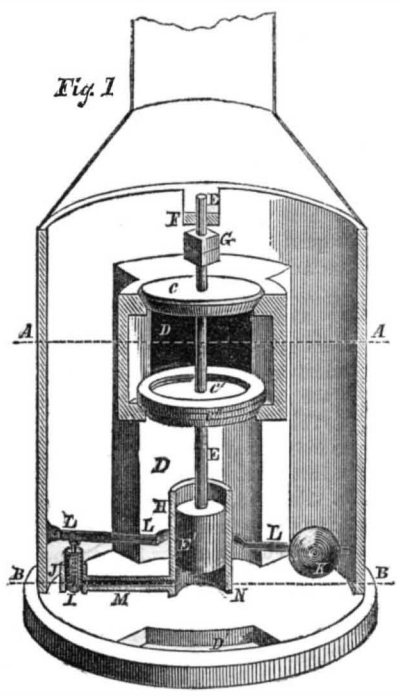
By removing the lower portion of the tubes, at the chin, the mask may be used to protect the face from severe wind and cold, and may, under some circumstances, be of great service to pilots, stage drivers, and others, whose occupations require them to be exposed to a great degree of cold, and to the beatings of storms in the face, which often seriously affect them in the discharge of their duties.

For further information, address the inventor as above; or, Geo. W. Backer, No. 85 Nassau street, New-York.

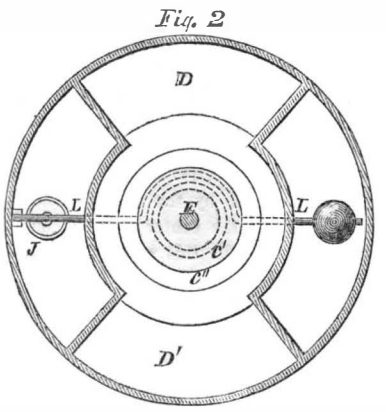
NELSON'S PROTECTOR FOR FIREMEN.

Day's Boiler Guard.

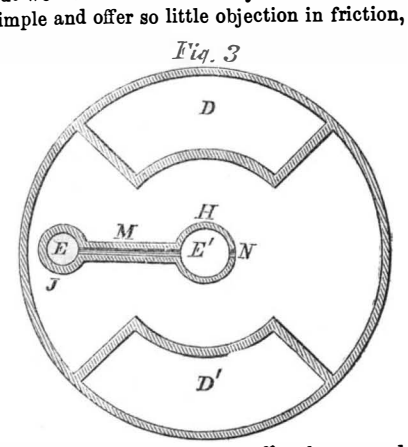
The action of the ordinary safety valve as a means of preventing the possibility of an excessive pressure within a steam boiler, is quite imperfect. The opening made by lifting safety valves of any reasonable dimensions is too small to vent all the steam which can be generated when the fire is in full activity, and



provide for the sudden generation of gases or super-heated steam, to which so many explosions are attributed, which occur on starting engines, or when the boiler, on account of low water, becomes highly heated; and except for the fact that the engineer is generally in attendance to close the damper or open the doors of the furnace, explosions would, with only the ordinary provisions against disaster, become the rule, rather than as at present, the much too frequent exception. Attention has, at different times, been turned to providing some more efficient means of protection, by



the offering of a larger area for the escape; but we do not recollect any which seem so simple and offer so little objection in friction,



and in the keeping up of stuffing-boxes and the like, as the device here presented.

Fig. 1 is a vertical section, fig. 2 a horizontal section on the line A A, and fig. 3 a horizontal section at a lower level, on the line B B. Fig. 1 is an attempt to represent a section in perspective, the better to show the relation of the parts. The principle consists in providing a balance puppet valve of large dimensions, which can be lifted from its seat by a comparatively small force, and so arranging and connecting this that by the lifting of an ordinary safety valve the steam will be admitted to a piston below the large balanced valve and lift it. Means are provided for avoiding the possibility of lifting the balance valve too wide, and the action of the whole will very evidently cease by the closing of the valve, as soon as the pressure of the steam in the boiler is sufficiently reduced.

The apparatus presents the appearance of a simple cylindrical or conically topped dome, and may be mounted on the top of any ordinary boiler. The construction is tolerably well shown by the figures. C and C′ represent, respectively, the upper and lower portions of the balance valve. The lower portion, C′, is a little larger than the upper, and the steam from the boiler is allowed to rise through the segmental openings, D D′, and to freely fill the chamber between these portions of the valve. The pressure is therefore directed upwards on the disk, C, and downwards on disk C′. The excess of pressure being downward, contributes, in addition to gravity, to close the valve and hold it tightly in its seat. As there are practical difficulties in the tight fitting of a balance valve under such circumstances, the lower disk, C′, is constructed with a movable ring, C″, tightly packed to the disk, so as to insure the perfect fitting of both portions of the valve, C C′, to their respective seats. The stem E, on which C and C′ are firmly secured is prolonged upwards through a fixed guide extended across, and is prolonged downward in the form of a large plunger, E′, fitted loosely in the cylinder, H, as represented. I is a small safety valve, peculiarly constructed, so as to guide itself in the small cylinder, J. It is held down by the force of the weight, K, acting through the lever, L, as shown. A free communication is made through the tube, M, from the cylinder, J, to the cylinder, H, before described; and a very small opening, N, is left in the lower portion of the latter, for purposes which will appear below.

When the pressure rises to such an extent as to lift the safety valve, I, the steam flows through the pipe, M, into H, and acts with considerable force on the under side of E′. As neither the cylindrical portion of the safety valve, I, nor the plunger, E′, fit tightly in their respective cylinders, the steam escapes slightly through the narrow annular openings thus allowed, as also through the small opening, N, described; but when the pressure becomes so great as to lift the safety valve ,I, considerably from its seat, the steam flowing through M, (which is much larger area than N,) rapidly accumulates under E, to such extent as to lift it, and with it the balance valve, C C′, and thus to present a very wide opening for the speedy relief of the boiler. So soon as the pressure is relieved, and the safety valve, I, sinks tightly to its seat, the steam under E′ escaping through the annular openings, and through N, allows the balance valve to sink tightly into its seat, and the whole now remains motionless, in its original condition, without leakage, until the pressure again becomes too great.

It will be seen that there are no stuffing boxes, and but a very inconsiderable amount of friction to be overcome in the working of this apparatus. A cord or chain may, if desired, lead up from the lever, L, to allow the engineer to raise it occasionally, and insure its perfect action, but there should be no extra means available for holding it down.

Any suitable means, by a screw or otherwise, may be adopted for adjusting the position of the weight, K, on the lever, L, and a small opening may be provided in the side of the exterior casing, through which the Inspector may operate with a suitable key in adjusting this weight to any point desired. Or, if preferred, the weight, K, may be dispensed with altogether, and a coiled or other spring, adjustable in any ordinary manner, may be substituted in its stead.

The inventor is Joseph C. Day, of Hacketts-town, N. J., of whom any further information may be obtained. Measures have been taken to secure a patent.

Scientific American.

NEW YORK, JULY 11, 1857.

Our Lake Superior Copper Mines.

The substance of our planet seems at some points to be composed of layers or strata more or less regularly disposed one upon the other, while at other points the whole seems to possess an uniform character termed granite. Explorations below the surface indicate that at a certain depth, varying from a few feet to several miles, a foundation of similar material will be found, beneath which no layers or other interesting characteristics exist, so that granite more or less coarsely crystalized, and very probably (judging from the increase of heat as we descend) in a melted condition, forms the great mass of the globe. It is a fact worthy of note that all the metals whether base or precious are found among the layers or strata referred to, little or none being ever obtained in the original granite, although there are points where the granite is so far softened and decomposed by various agencies that it might be operated in with some degree of facility. Iron appears to have been, like the earthy substance of the layers among which it is found, deposited by water, but most metals generally appear to be lodged by some other agencies. In Europe, according to Overman, the great repository of metallic matters is the lowest strata, the Gneiss or Mica slate, very little ore being discovered in the layers above. In our country, however, this order of things does not prevail. Here, copper, for example, is usually found in vertical veins in the transition series, or in other secondary deposits, while in the gneiss very little can be detected. In much of the Lake Superior region, the metal lies in trap, or sandstone rock, or near their junction, in the form of injected veins. It is, according to Muspratt, a question whether copper has generally been forced up from below by some extraordinary convulsions analogous to volcanic action, or whether the metal has been deposited by more or less gradual filtrations of some fluid containing it. It is possible that copper has been introduced among the strata by both these methods.

The naturally pure copper produced from the mines of the Lake Superior region commands a price usually from one-half cent to one cent per pound higher than copper which has been reduced from an ore. A May number of the Lake Superior *News* details some of the mining operations in that vicinity, which differ from those on smaller masses found in other copper regions. It appears that the cutting up of one lump met with last year in the "Minnesota" mine is, as yet, very far from completion. Eight masses were taken off in April weighing altogether 50,601 pounds, and in performing these, and the previous operations on this mass, thirteen barrels of copper chips, weighing altogether 7310 pounds were also taken off. The total amount taken from this single lump up to May was over seventy tuns, and it was judged it would require one whole year more to cut the mass entirely up. The copper cutters had not at that date taken any piece from the second tier, but had only removed in places the edge of the mass. Several cuts had been made 4 1-2 to 5 feet deep, and its thickness was still increasing towards the center.

The means employed for separating such masses into parts small enough to be managed are quite primitive and simple. A channel is driven along the line chosen for separation by means of what is usually termed in the machine-shop a cape-chisel. It is simply a cold chisel of great thickness, but only about five-eighths of an inch wide on the cutting edge. This chisel is held in line by one man, while two others strike it with heavy hammers, usually swung overhand. The tool cuts out a chip or shaving of copper something less than one-eighth of an inch in thickness, and the operation is repeated until the channel is cut entirely through the mass The width of the channel thus cut is about thirteen-sixteenths of an inch, which is also, of course, the width of the chip taken out. It requires much skill to hold the tool so steadily as to avoid throwing it out of the copper, and at the same time to keep the line of the channel entirely straight. The copper is beaten up by the chisel so as to make the chip much shorter than the cut from which it came. It is usually two-thirds of the length of the place from which it was taken.

The product of the Minnesota mine for April was 370,550 pounds, or 185 tuns and 550 pounds. This is the largest amount of copper ever taken from a mine on Lake Superior in a single month, and probably the largest ever taken from one mine in the world during a similar period. Consolidated European companies have in but a very few instances taken out as much from several mines under their charge in as short a time.

The copper of Lake Superior lies generally quite near if not on the surface. The great copper mines of Cornwall, in England, where the average yield of the ores is only from 6 to 7 per cent, are from one to two thousand feet deep, and require a pumping power for drainage equal to lifting from 1000 to 2000 gallons of water from that depth every minute. But on Lake Superior the official reports of the "Copper Falls Company" refer to depths of 15 feet, and the "East Merryweather Company" to 12 feet, as being among those at which they are working.

It appears from the books of the Copper Falls Mining Company that the whole of the workings on the vein (including the unproductive as well as the productive in the calculation) yielded upwards of 279 pounds of copper per superficial fathom of 36 feet. Considerable silver is also found in the vein, from which fine specimens are often extracted. The cutting up of large copper masses has now become a quite important business, and any invention which will perform this labor successfully by steam power would be rapidly adopted. Several expedients for the purpose have been tried and rejected as impracticable, or as inferior from some cause to the expensive and laborious hand labor.

Artificial Propagation of Fish.

This subject is attracting considerable attention in our country at present. In 1856, the Legislature of Massachusetts adopted a resolution, under which commissioners were appointed to examine into it and report such facts as they could obtain, to the next General Court. Three commissioners were selected —R. A. Chapman, Henry Wheatland, and N. E. Atwood—their report has been published, and is now before us. Mr. Atwood, who is a practical fisherman, and also a learned ichthyologist, was intrusted with the charge of making experiments and observations and confined his attention to trout. His experiments were conducted at Sandwich, but they turned out failures. He obtained 15,000 eggs, and they all rotted; this he attributed to the character of the water in which the experiments were conducted. November is the spawning season of trout and salmon, during which period, they are very poor, and should not be allowed to be caught or sold.

Although the experiments with the eggs of trout failed with Mr. Atwood, the commissioners believe that such fish may be profitably cultivated. They state it as their belief that there are many farms in the hilly regions of Massachusetts, containing trout streams, that, with little pains, might be made to yield a greater income than the land itself. Much might be done to increase their value without resorting to artificial breeding. The preparation of suitable ponds or pools of deep water and gravelly beds, suitable for spawning, with guards to prevent the destruction of fish by freshets, would greatly increase the stock. "But the process of artificial propagation," says the report, "is so simple and easy, that when trout become an object of care, we cannot doubt they will be multiplied and protected by this method. Many millions of fine trout may thus be produced annually, and what is now regarded as a mere temptation to waste time, may be made, not only to minister to luxury and health, but become an important branch of productive industry. In addition to this, fish ponds with borders of trees and shrubery, add to the beauty of a landscape, and increase the value of a farm."

It is stated that in England, salmon have been propagated with success, and that of 300,000 of their spawn 275,000 were hatched artificially.

It is our opinion that this subject deserves great attention, because in many of our creeks and rivers that once teemed with the finest salmon, not one is now caught. When the first settlers came to our shores, they found salmon in every running brook having easy access to the sea; now such fish are alone obtained from the "Northern Provinces."

But there is one feature connected with fish culture, which we wish to impress indelibly upon the minds of those who wish to re-stock our streams with an abundance of good fish; that is, they must keep the streams clean and pure, if they expect to succeed.

It is true that salmon and other fish have been banished from rivers and creeks in which they once abounded; but this was not owing to the great depredations of fishermen, as has generally been supposed.

The erection of saw mills on creeks and rivers destroyed the spawn of both salmon and trout, and it has been found that the former fish have been banished from all rivers on which chemical works have been established. They love clear running streams of water, and flee from saw-dust and the drainage of chemical works in rivers, as people do from a pestilence—they are sensible fish.

To Dissect the Atmosphere.

The atmosphere in which we live, that supports all animal life in respiration, and all the furnaces, fires, and decaying organic matter on the globe in combustion—fast and slow—is stated to be principally composed of two gases. How do we know this? By performing the following experiment:—Take a glass vessel containing a certain amount of water, in which is placed a cork to float a piece of phosphorus on its surface; ignite the phosphorus, then place a glass globe over it, (and into the other vessel, which must be wider than the globe.) White vapors will soon arise from the burning phosphorus, which at first burns brightly, but soon grows fainter and fainter, then goes out entirely. If when the phosphorus commenced to burn, the glass globe contained five pints of air, it will be found that it only contains four pints after it is extinguished. If a lighted candle be now placed in the four remaining pints of air in the globe it will not burn, but it would have done so freely before the phosphorus was consumed in the five pints of air. This shows that the properties of the air in the globe have become entirely changed by the act of combustion with the phosphorus, and that the gas which supported combustion—to employ a common term—has been all "used up." The gas which supports combustion is oxygen and the experiment described, by which one part of oxygen has been removed out of five volumes of air proves that the proportion of oxygen in the atmosphere is only as one to four of another gas, which cannot and does not support combustion.

The remaining four volumes or pints of air left in the globe is nitrogen, which amounts to eighty in every hundred parts of the atmosphere. (There is also a little carbonic acid gas in the air—one part to every two thousand.) The relative proportions of oxygen and nitrogen described in the atmosphere, taken from any part of the globe have been found to be constant; they are permanently elastic gases, and simple bodies. In the atmosphere they are mechanically, not chemically combined.

By burning phosphorus in the manner described we obtain nitrogen gas, which when washed, by agitating it with water in a glass vessel, may be employed for an elastic gas cushion or spring, in a vessel containing mercury, or any metal where atmospheric air cannot be employed, because of the oxygen it contains having such an affinity for the metals as to rust them and destroy their properties. Nitrogen is transparent, has no taste or smell, is a perfect non-supporter of combustion, and exhibits no tendency to combine with other substances. Although four volumes of nitrogen is inhaled into the lungs for every one of oxygen during the act of respiration, it produces no effect upon the human system.

At one period it was taught and believed by chemists that oxygen was the sole cause of combustion—that when it was not present combustion could not take place. This is true so far as it relates to combustion in the atmosphere; but some bodies will burn without oxygen being present. Thus iron and sulphur, when heated, will combine with much light and heat; and phosphorus, when introduced into chlorine gas, will take fire and burn, combining with the gas. The true definition of combustion is, "chemical combination attended with light and heat."

Although nitrogen is termed the *most inert* of gases. because it cannot be made to unite directly with any element, and only forms combinations when one or both elements are in the nascent state, yet it plays a most important part in the animal, vegetable and mineral kingdoms. It might be readily supposed that as oxygen is *vital air*, and as it alone performs a part in the act of breathing —the nitrogen being inert—that the greater the quantity of this gas mixed with nitrogen the more healthy it would be for respiration; it is not so, however. It is remarkable that the most powerful of acids, aquafortis, is composed of five parts of oxygen (vital air) and only one of nitrogen.

Volatile Gold—Deficit at a Mint.

It is reported that there have been great defalcations of gold in the Branch Mint at San Francisco. No less than 5000 ounces of gold, amounting in value to $85,000, are missing. This great loss of gold is attributed to its volatization and escape out of the chimney in the smelting process. One account says that Col. Harasythy, the assayer, caused a zig zag chimney to be erected, and in the course of two and a half months, 1180 ounces were collected in it. Another account states that the sweepings of gold from the flat roof of a house adjoining the Mint, amounted to 300 ounces per annum. The great draft in the chimney, it is alleged, carried up the gold, and in this manner, the deficit is attempted to be accounted for. Of course, if the gold has been found on the roof of the Mint and on that of an adjacent building, it can be proven by witnesses; but it appears rather singular to us, if this is true, that like deficits have not occurred at the Assay Office in this city, and at the Mint in Philadelphia. The general opinion respecting gold is, that it cannot be rendered volatile in the common furnaces of gold refineries, to be carried up the chimney in the manner attributed to the Mint at San Francisco; and even if it were liable to be thus volatilized, the assayer should have known better than to have allowed it to be thus lost, as means could have been provided to prevent it.

The Patent Office Records and Patent Claims

If our Patent Office was nothing more than a simple Hall of Records, containing specifications and descriptions of inventions—accounts of what had been accomplished by previous inventors—its beneficial character would be incalculable in preventing subsequent inventors repeating experiments, at great expense to themselves, and re-inventing old discoveries. We have not the least doubt that publications of the "Patent Claims" in our columns every week, save millions of dollars to our country, because they give information respecting what certain inventors have done; and thus they prevent other inventors from studying, laboring, and experimenting to accomplish certain results that have been previously obtained. It is notorious that numerous inventions, for which patents have been granted, are re-invented over and over again by persons who have not made themselves acquainted with what had been done before them, and these inventions cost money, time, and labor; but for one such case, there would be twenty, were it not for patent records.

Separating Bran from Starch.

A correspondent states, that in the manufacture of starch the finer particles of bran penetrate through the finest sieves, and that an improvement which would remedy this evil would be valuable.

A tunnel is about to be commenced through Mount Cenis, in Sardinia, which will not be less than six and a half miles in length.

Virginia Mechanics' Institute.

The *Cotton Plant* of the 20th ult. contains the address of Governor Wise, of Virginia recently delivered before the above named institution, organized in the city of Richmond. It is an eloquent production, and it affords us pleasure to place some extracts from it before our readers :—

"The utility of Mechanics' Institutes is at once presented to the mind by the wonderful developments of the age in improvement. The Titans and the Tubal Cains are at work among men, and the Vulcans are thundering on their anvils among the gods. The enterprises of earth are so monstrous that piety is almost afraid lest human power is exceeding the bounds of humility toward heaven. Never in any age was there such a stir amidst the atoms of matter. Material nature is vexed in all the dust of her dominion, and earth and air, and ocean and light, in all their parts and elements, are put into the whirl of motion. The years of old Time are quickened into seconds; the miles of space are shortened to a span; power is multiplied in the ratio from the mere might of animal muscle to the fearful potence of steam and electricity ; a farthing candle is turned into more than 'Aladdin's lamp,' which pours its floods of light over cities, and along pavements and highways; and the sun himself has turned painter and printer. . . . . The result of this is plenty of food and raiment, and locomotion without limit, and habitations up to crystal palaces, and all the world for immediate neighborhood by a quick intelligence, and human comforts and luxuries of mind and body, which exalt and dignify us with a civilization which the world has never known before, and which, guided by a sound Christian philosophy, foreshadows 'peace on earth and goodwill to man' (Cheers.) Wonderful! wonderful! and all these wonders come from the wand of mechanism! Every humble operative in the world contributes to the grand result. Toil on, then, patient and lonely laborer! To invent, to apply, to control, to guide this magic power, is the necessity for Mechanics' Institutes. They are founded on the co-operation of labor, and the principle that industry is essentially social. . . . . The objects of Mechanics' Institutes are :—

1. To perfect the mechanic arts. So important is this that every source of power and production depends upon them, and the people who do not keep pace with their improvements, and who do not make their products of themselves, will fall back in the race of nations. Agriculture depends upon them and their perfection for all its implements—its plows, its chains, its sowing and planting and reaping machines. Manufacturing and mining and the forests depend upon them for all their machinery—their engines, their levers, their shafts, their spinning jennies, their planing machines, their machine seamstresses, their saw mills, their grinding mills, their every variety of cogs and wheels, in all the mazes of minute and mammoth construction. Commerce is dependent upon them for its ships and its cars, and for all the appliances of transportation and navigation, by land and by sea. . . . . And the learned professions—theology, law, and medicine—are really dependent upon the mechanic arts for their perfection. Where would all have been but for the mechanism of printing ? But the tongues of men and angels could not enumerate these innumerable dependencies. They are infinite in variety and connection.

2. The object of the Institutes is to exalt the dignity of mechanic labor. Who shall despise the arts upon which all else is dependent? What civilization shall despise a labor upon which every civilization depends? Who shall tread upon the arts by which man is fed and clothed and housed and transported, and is raised to refinement, and the taste of the fine arts, and the enjoyment of an elevation in the moral scale which cannot be reached but by physical improvements? Morse is a mechanic, Fulton was a mechanic, Franklin was a mechanic, Sir Christopher Wren was a mechanic, God is a mechanic. . . . . .

3. The third object of the Mechanics' Institutes is to multiply occupations among men, particularly in the agricultural States.

A few professions and vocations in a nation will not and cannot support a dense population and raise a people to wealth and power, and sustain them in any grand progress.—Virginia has heretofore been peopled by planters, divines, lawyers, doctors and manual operatives. She has not been distinguished at all for mechanism, and has relied mainly upon one power only for production—the science of agriculture. The mechanic arts have not been honored, fostered and promoted as they must be, and as our best interests require. I rejoice that Richmond and Lynchburg, Petersburg and Wheeling, are beginning to lay hold on this lever of power and progress. Never was there such a workshop for mechanics as Virginia now is. She has inexhaustible mines of iron coal, copper and salt, and interminable forests of timber. Wood, iron and coal are all that mechanics want. All we want is for the popular mind to be aroused, and for the proper beginning in the right way to be made. And though we have reason proudly to thank some benefactors, such as an Anderson, of Richmond, (proprietor of the Tredegar Iron Works,) and a Sweeney, of Wheeling, and others, their fellow laborers and coadjutors, for pioneering in the work, yet we can hardly be said to have made a beginning. The ghost of Jefferson would vanish with shame were it to come and be told that we still buy our household furniture and utensils, our plows, hoes, axes and helves, and ox yokes, horse buckets, broom handles, brooms, clothes-pins, carriages, harness, and clothes, hats, shoes, boots, coats, vests, pants, everything—something of everything from Old and New England."

The above are only a few extracts from this address; they will show that Governor Wise treated the subject in a broad, generous, common sense and elegant manner. We hope his words will have a powerful effect in arousing the people of Virginia to a sense of their responsibility in cultivating the mechanic arts.

Preparations for Laying the Atlantic Telegraph Cable.

The frigate *Niagara* was expected to be complete in her alterations on the 20th ult., on which day she was to leave Portsmouth for Liverpool to take in her share of the submarine cable. It is to be stowed in five separate coils, connected together, each wound around a large wooden cone, to prevent fouling when running off. Two coils will be placed aft, the lower one on the "orlop," and the second one on the "berth deck;" the three other coils placed forward will be arranged one above the other on separate decks, the lower one being on the hold floor. The cable will be run out at the stern through a hollow cone, and pass over friction rollers. It weighs nearly one tun to the mile, and will be 1250 miles long. This cable is now finished, and lying at Birkenhead. It was completed by the contractors, Messrs. Newall, of Liverpool, in eighty days, three weeks before their term for executing it had expired. The manufacture of the cable employed 100 machines for making spun yarn, with which the gutta percha insulation is covered. The cable consists of a main strand of 7 copper wires covered with three coats of gutta percha, served from end to end with the spun yarn, and over this are laid eighteen strands of twisted wires, seven wires in each strand, forming the exterior of the cable. There are in all 25,000 miles of covering strand — total wires, 175,000 miles — long enough to go seven times round the world.

When the cable was finished, on the 8th of June, the contractors gave a dinner to the workmen employed on it and to their wives, seven hundred being present at the party. On that occasion, W. Reid, an electric engineer, who was present, stated that he had made an experiment with the cable that day, and had established perfect telegraphic communication through its whole length with a very minute battery which he exhibited, the plates of which were only one quarter of an inch square. It is no doubt much easier to work a telegraph on land than in water, but several engineers present who had doubted the practicability of working the cable had their doubts removed by Mr. Reid's statement.

The Atlantic Telegraph and the steamship *Great Eastern* are the two most gigantic enterprises of the present age.

Cambridge Professors and the Spiritualists.

Some time since, an offer of $500 was made through the *Boston Courier* to any one who could exhibit in the presence and to the satisfaction of certain Professors of the Natural Sciences in Harvard University, any such marvelous phenomena as were commonly reported by spiritualists as having transpired through the agency of "mediums." This challenge was accepted, through Dr. Gardner, and several persons professing to have spiritual communications, met in the Albion Building, Boston, on the last week of June to show their powers, and among the number were the "Fox girls," so celebrated for their achievements in this line.

The committee appointed to judge in the case, consisted of Professors Pierce, Agassiz, Gould, and Horsford, of Cambridge. The spiritual experiments were conducted for several days, and the mediums allowed ample and fine opportunities of making demonstrations; but like the priests of Baal, in the days of Elijah, they failed to call down their deities.

The following is a portion of the report of the committee :—

"The committee award, that Dr. Gardner, having failed to produce before them an agent or medium who 'communicated a word imparted to the spirits in an adjoining room,' 'who read a word in English, written inside a book or folded sheet of paper,' who answered any question 'which the superior intelligences must be able to answer,' 'who tilted a piano without touching it, or caused a chair to move a foot;' and having failed to exhibit to the committee any phenomenon which, under the widest latitude of interpretation, could be regarded as equivalent to either of these proposed tests, or any phenomenon which required for its production, or in any manner indicated a force which could technically be denominated spiritual, or which was hitherto unknown to science, or a phenomenon of which the cause was not palpable to the committee, is, therefore, not entitled to claim from the *Boston Courier* the proposed premium of $500."

Stopping Table Turning.

One of our exchanges states that Professor Leibig stopped table turning in Munich Bavaria, by a very simple expedient. It seems that table turning succeeded marvelously in that city for a short time when it was first tried, and intelligent people were amazed at the phenomenon,and really believed, either that spiritual forces were at work in the mahogany or that some new physical power was unfolding itself. "They naturally went to the great philosopher to obtain his opinion. He simply said: 'Place your hands under the table, and not on it.' They did so, and no table, however light, though running on castors over the polished floor under the smallest impulsion, would budge a hair's breadth. The good people of Munich, again astonished at the facility with which they had deceived themselves, thanked Liebig for opening their eyes; for it is not the custom there to consult men of science on obscure subjects, and then abuse them if their opinions do not happen to coincide with the popular madness of the hour—the table turning has never troubled Munich since. The explanation, of course, was, that when their hands were under the table, they could not push it without a conscious effort, inasmuch as the force of gravitation was against them. And, as they were honest people, they would not push, and, as the table was an honest table, it would not go."

Care of China and Glass.

The manufacture of pottery in all its branches of earthenware, china, delfware, porcelain, &c., is now denominated the *Ceramic* art. This name, which is derived from the Greek, signifying burnt clay, was originally given to the art of pottery by the French. Like many other arts, it had its rise prior to the known date of its history; but from the period when Jeremiah was commanded to "go down to the potter's house," the Ceramic art has till the present day been steadily improving, calling to its aid every resource of mechanical and chemical science to co-operate with painting and sculpture, till at length it has become one of the most valuable departments of the industry of all nations.

When common clay is molded into a form and baked, it is called earthenware, and it is pretty certain that this was the first step in the art of pottery. When clay is mixed with flinty earth, and afterwards baked, it forms a semi-transparent mass ; and as this compound was first known in China, and imported from that country into England, the ware thus made received its present familiar name of "china." A similar compound was first made in Europe, in the island of Majorca, about 450 years ago. The articles there made were called "porcelana," from the Portuguese word, which interpreted means "a cup;" and hence we have the word porcelain, to denote the finer kinds of pottery.

One great object for those who have sets of china or glass is to render it capable of withstanding a sudden change of temperature, so that it will be capable of exposure to sudden heat and cold without being broken. This is best done by placing the articles in cold water, which must gradually be brought to the boiling point, and then allowed to cool very slowly, taking a whole day or more to do it. The commoner the materials the more care in this respect is required. The very best glass and china is always well seasoned, or "annealed," as the manufacturers say, before it is sold. If the wares are properly seasoned in this way, they may be "washed up" in boiling water without fear of fracture, except in frosty weather, when, even with the best annealed wares, care must be taken not to place them suddenly in too hot water. All china that has any gilding upon it must on no account be rubbed with a cloth of any kind, but merely rinsed, first in hot and afterwards in cold water, and then left to drain till dry. If the gilding is very dull, and requires polishing, it may now and then be rubbed with a soft wash-leather and a little dry whiting; but remember, this operation must not be repeated more than once a year, otherwise the gold will most certainly be rubbed off, and the china spoiled. When the plates, &c., are put away in the china closet, a piece of paper should be placed between each, to prevent scratches. Whenever they "clatter," the glaze or painting is sustaining some injury, as the bottom of all ware has little particles of sand adhering to it, picked up from the oven wherein it was glazed. The china closet should be in a dry situation, as a damp closet will soon tarnish the gilding of the best crockery.

In a common dinner service it is a great evil to make the plates too hot, as it invariably cracks the glaze on the surface, if not the plate itself. We all know the result—it comes apart; "nobody broke it," "it was cracked before," or "cracked a long time ago." The fact is, that when the glaze is injured, every time the "things" are washed the water gets to the interior, swells the porous clay, and makes the whole fabric rotten. In this condition they will also absorb grease; and being made too hot again, the grease makes the dishes brown and discolored. If an old, ill-used dish be made very hot indeed, a teaspoonful of fat will be seen to exude from the minute fissures upon its surface. These latter remarks apply more particularly to common wares.

In a general way, warm water and a soft cloth is all that is required to keep glass in good condition; but water bottles and wine decanters, in order to keep them bright, must be rinsed out with a little muriatic acid, which is the only substance that will remove the fur which collects in them; and this acid is far better than ashes, sand, or shot; for the ashes and sand scratch the glass, and if any of the shots are left in by accident the lead is poisonous. A little soda dissolved in warm water, is also very excellent for washing bottles.

Richly cut glass must be cleaned and polished with a brush like a plate-brush occasionally rubbed with chalk; by this means the luster and brilliancy are preserved.

SEPTIMUS PIESSE.

R. H. D., of N. C.—Please to send us a sketch and description of your machine for cutting out shoe strings from leather scraps, for examination and we will forward you specific directions in regard to an application for a patent.

Isaac Simmons, of Baltimore, Md., wishes to obtain a cheap machine for cutting ditches narrow and wide, shallow and deep. He also wants a machine for bending carriage felloes.

R. W. S., of Ala.—We do not know of any special work to which we can refer you as a guide in the construction of iron verandahs.

S. P., of California—We are much pleased to announce the issue of your Patent and we hope you have received it before this. Ten dollars received to balance your account.

J. H. W., of Va.—The *camera obscura* is an instrument employed for copying pictures, landscape scenes or figures. The instrument can be adjusted to reduce the views to any size.

P. E., of Conn.—You should not be too hasty in expressing your opinion of what seems to you to be a neglect on our part. You say "we have not dealt justly by you," when the simple facts are, that when you wrote to us you omitted to sign your name to your letter, and thus we were ignorant of your proper address. This is not an unusual oversight. Such letters often come to us. You can no more patent your proposed improvement than you could claim a patent for plowing by a wheelbarrow. The application is new, but the machine itself is old and very common.

C. C., of Ohio.—We shall soon announce our new prospectus for Vol. 13, and we hope you will be active in getting up a club at your place. We shall offer liberal prizes, as a substitute for traveling agents upon whom the public cannot always rely. The sewing machine improvement you propose cannot be patented It is the same in principle as one of Singer's Patents.

W. S. McKay, of Lafayette, Ind., informs us in answer to a recent correspondent that he can furnish a set of tools well adapted to Artesian well boring,

W. H B., of Ill.—We have never heard of any machine being employed for digging out coal in the mines. It appears to us that a machine can be invented for this purpose, and produce good results.

E. S. J., of Wis.—If, as we suppose, your plows turn furrows transverse to the track of the locomotive, there is no novelty in it. On page 401, Vol. 6, of the Scientific American, you will find an engraving of substantially the same arrangement—an English invention.

J. R. G., of Wis.—Your letter, covering $4, is at hand. We cannot inform you how the linen is prepared on which we make our drawings. It is imported from Europe in long rolls, and is the subject of an English patent.

R. K V., of N. Y.—We have received a pretty large pile of articles on "the conservation of force," all treating of the nature of gravitation. Yours contains nothing new.

J. T. B., of Conn—You can obtain permanent magnets of Pike & Sons, Broadway, this city.

C. M., of Mass.—You may add any coloring substance, such as logwood, to the water-proof recipe in No. 20 of this volume, without injuring its property.

J. T., of Md.—The difference between exhausting the steam of a 26 horse power engine into the atmosphere and into a tank of water, depends on the pressure of the column of water. The pressure of the atmosphere is 15 pounds to the square inch, and so is that of a column of water 30 feet high. You have not stated what the amount of pressure in your tank is, but that "it contains a large body of wood." The tank may be made shallow, and the back pressure of the water reduced to a few pounds.

J. H. H., of Md.—To prepare the water-proof cement to which you refer, dissolve the asphaltum and india rubber in turpentine, in about equal parts. Cut the india rubber into fine shreds, and reduce the asphaltum to powder, prior to dissolving them; stir them thoroughly in the turpentine, which must be kept warm, and in a vessel having a close cover.

D. B. R., of Min. Ter.—It is the caustic alkali combined with silica, which renders the glass soluble.

E. W. D., of Mass.—Your electro-magnetic engine, composed of a series of thickly set radial armatures on a hollow shaft, to be actuated by four horse shoe electro-magnets—one set at each corner of the engine frame—is not a good arrangement.

N. N. McL., of Iowa—Your lightning rod insulator appears to be a new, useful and patentable improvement.

H. L., of N. Y.—It has often excited our surprise that team has not already superseded horse power on canals. By constructing a double railroad track on the banks of the Erie Canal, and using different locomotives for different levels, we are positive that twice the amount of towage, at one-half the expense now entailed, could be performed.

S. T. R., of Mass.—Do not deceive yourself in making gas from water, expecting to set Boston in a blaze with Cochituate. There is nothing new in producing light, and a good light too, from the gases of water, but the process is dangerous, being subject to explosions; and besides it is very expensive.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, July 3, 1857:—

J. McC., of N. Y., $35; G. C. G., of ——, $20; C. C. S., of Vt., $30; A. L., of N. Y., $20; J. M., of N. Y., $10; E. C., of Pa., $100; S. R. H., of N. Y., $25; F. & M., of Mass., $50; T J. P., of Ill., $30; A. W., of N. H., $30; A. F. W., of L. I., $30; J. G., of Pa., $35; S. C., of Va., $10; N B, of Ill., $25; C. E. C., of O., $22; J. T., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 3, 1857:

M. & W., of O.; F. & M., of Mass. (2 cases); J. T., of N. Y.; S. R. H., of N. Y.; A. F. W., of Ky.; C. & S., of Ohio; C. E. C., of Ohio; N. B., of Ill.; F. N., of L. I. B. C. V., of Ohio; G. H. W. of Wis.

Literary Notices.

THE FAMILY CIRCLE GLEE BOOK.—This is a compilation of two hundred popular songs, glees, and choruses, with accompanyments for the piano, seraphine, and melodion, by Elias Howe. It contains some of the best songs in our language. Music in "the family circle" is one of the sweetest and most fascinating influences for rendering it an endeared and attractive spot. How soothing to the feelings, after the toils of the day are over, to listen to or join in a song which fills the heart with ennobling emotions and lifts its aspirations above things that are sordid, trivial, and vain; hence we welcome such works as the above—their tendency is to make mankind better and happier. Published and sold by Mason & Bros., of this city. Price, $1.25.

ILLUSTRATED COMMON SCHOOL ASTRONOMY.—This is the title of a very excellent little work, by Professor Brocklesby, of Trinity College, Hartford, Ct., and published by Farmer, Brace & Co., No. 4 Courtland-street, of this city. It is written in a clear and simple style, eminently adapted for teaching the outlines of this science. Its aims are to render familiar the important truths and facts of astronomy, avoiding cumbrous details.

BLACKWOOD'S MAGAZINE.—The June number of this excellent Magazine, promptly republished by Messrs. Leonard Scott & Co., contains the concluding part of "The Athelings." An article on American explorations in China and Japan, is a treat. It is a capital number.

Important Items.

☞COMPLETE SETS OF VOLUME XII EXHAUSTED.—We regret that we are no longer able to furnish complete sets of the present volume. All the back numbers previous to No. 27 are entirely exhausted.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post of fice at which they wish to receive their paper, and the State in which the postoffice is located.

Subscribers to the SCIENTIFIC AMERICAN who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

INFALLIBLE RULE—It is an established rule of this office to stop sending the paper when the time for which is was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

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. Price of binding 75 cents.

PATENT LAWS AND GUIDE TO INVENTORS.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

Terms of Advertising.

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

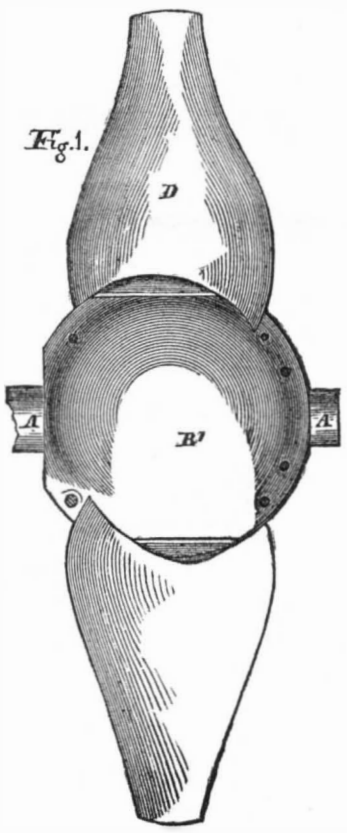
☞ All advertisements must be paid for before inserting.

Science and Art.

Adjustable Screw Propeller.

The proper proportions of a screw to serve in propelling a vessel through the water, has long been a subject of investigation, and one which is yet not fully settled. There are so many variable circumstances involved, that it is almost impossible to determine beforehand, precisely the best form for any given vessel. Some of the earliest experimenters in propulsion employed screws of considerable length, so that the threads made one or more complete revolutions. Curious inventions are now continually springing up, in which similar screws are represented; but the first careful experiments on the subject sufficed to show that the resistance due to the friction of the water on such extended surfaces, involved a greater loss of power than could be gained from the increased length. By gradually cutting down, it has been proved that something less than one complete revolution is the best area of screw-blade, and that if this area is divided into two or more threads, and the length of the screw consequently diminished in the same proportion, the efficiency of the instrument is still more increased. Beyond this, there are numerous delicate questions involved, with regard to the exact form of the blades, a radial increasing pitch, a fore-and-aft increasing pitch, the parabolic curve, the boomerang, the utility of lips or flanges on the outer or inner edges of the wide part of the blade, the proper construction of the hub and of the arms connecting the broad blades therewith, and a host of other details, all very important, but not essential to the understanding of the invention under consideration.

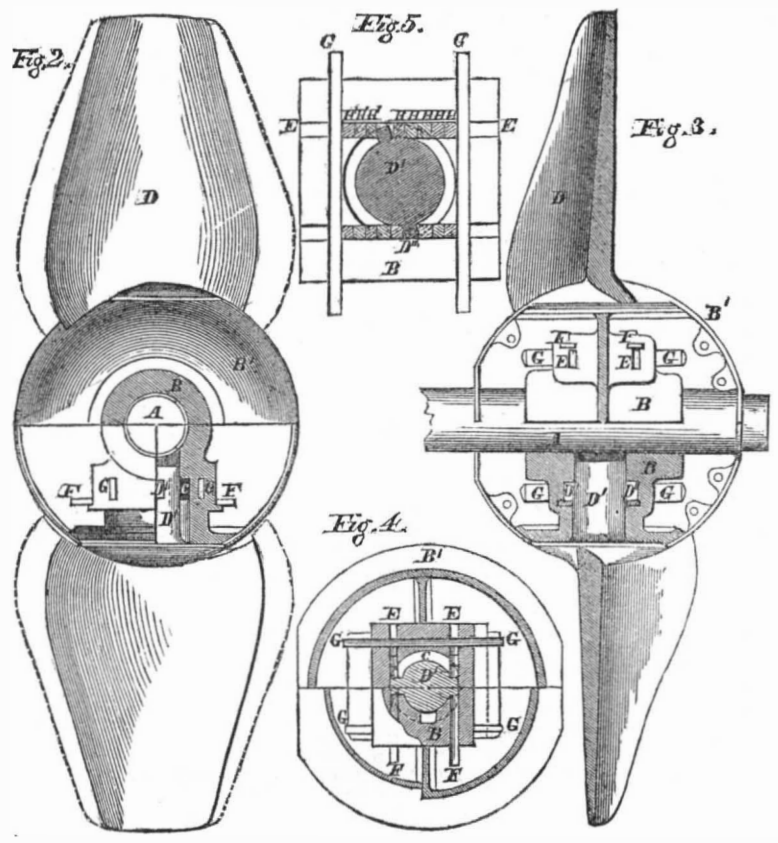
The "pitch" of a screw propeller, like the



pitch of any ordinary screw, means simply the length of screw in which a full revolution of a thread would be completed, were it sufficiently long As intimated above, the absolutely best proportion is rarely attained except by accident, and it is consequently of great advantage to secure the means of varying the pitch of a propelling screw, at pleasure. The design of the invention under consideration is to enable the pitch to be varied at pleasure, within certain limits, and also to render easy and perfectly practicable, a substitution of a new blade in place of a broken or defective one.

The Griffith propeller is an English invention, and has been several years in use, on a number of large British vessels. It has but recently been patented in the United States, but has been applied on several of the most successful modern screw ships, among which may be instanced the screw frigates *Niagara* and *Merrimac*. The invention is generally applied in the form of a two-bladed screw but three or four blades can be applied in this manner if desired. The appearance is quite novel. Fig. 1 is a side elevation. Figs. 2, 3, 4, and 5, are views, all more or less sectional. The drawings are all on the same scale, except Fig. 5, which shows the extreme central portion on a considerably larger scale. The hub, it will be observed, is a compound construction, enclosed in a spherical casing. The blades, contrary to the general practice, are widest at their inner ends, analagous, in that respect, somewhat, to the wings of birds. A

GRIFFITH'S ADJUSTABLE PROPELLER.



blade D to the hub by turning it into such position that the projections D″, on its cylindrical portion D′ shall correspond with the grooves in the opposite sides of the cylindrical cavity in the solid hub, into which it is to be inserted. To allow the blade to be revolved after it is fairly in its place, an annular space or ring of sufficient size is turned out. It is now easy to see that the blade can be inserted only when held in one position; but after it is fairly in its place in the hub, it can be readily turned into any position desired.

By turning the blades in the manner thus provided for, any desired inclination or pitch of the screw can be obtained. When they have been adjusted in the desired position, they are held in place by keys and small blocks of metal, arranged in the manner we will now endeavor to describe. There are two sets of keys, F, G,; the keys F pass over the lugs D″, and serve to hold them in, or rather to prevent the blade D from working or rattling radially, as it revolves. They tend to draw the blade D tightly *into* the hub B, and the blade D is therefore tightly confined, the keys F tending to urge it further in toward the shaft A, while the broad collars represented, support this pressure, and by their friction tend, without further assistance, very strongly to prevent any possible movement of D in any direction.

But as a means of insuring that the blades shall retain precisely the pitch desired, suitable channels, E, are provided, in which pitching pieces or simple blocks of metal, H H′, are inserted from each side, and caused to bear against the lugs or projections D². The keys G are then driven tightly through seats provided as represented; and these keys and pitch pieces, independent of any aid from F firmly retain the blades in the pitch desired. Thus, if the blade tends, by any violent contact with a log or lump of ice, to be twisted around in its socket in one direction, the pitch pieces H receive the pressure, and if in the other direction, the pitch pieces H′ are similarly affected; but in either case, no motion of the blade can possibly ensue.

The shell B′ is made in two parts, and secured together by bolts. Its whole objects are to protect the keys and other work in the interior from violence, and to make a smooth surface for the action of the water. It is contended, and with some reason, that the volume of the spherical mass, B′, is an advantage rather than a detriment to the efficiency of the propeller. Without discussing the question, we may observe that it is found, practically, to present little or no difficulties, and that the propeller, as a whole, is a very desirable one for large vessels. For use in sea water it is constructed of brass, as iron would probably oxydize, and the parts consequently stick fast. Constructed as represented, of suitable metals, the pitch is readily adjusted whenever the ship is docked, or when, as can be done with most of the two-bladed screws, the whole has been disconnected from the shaft, and lifted through a suitable aperture in the stern. In short, whenever, by any ordinary means, the hub of the screw becomes accessible, the shell, B,′ is readily removed, and the blades adjusted in any position desired, within the limits required in practice. In case a blade of an ordinary propeller becomes broken, the whole is rendered nearly or quite useless, and either a spare propeller must be carried, or the voyage must be completed very slowly, and at great risk of sinking the vessel from the destruction of the stuffing box due to the unequal balance of the propeller. With the Griffith screw, on the contrary, it is simply necessary first to find, by trial, exactly the pitch with which the ship can be moved the fastest, with the least expenditure of fuel, and subsequently, if a blade breaks, or otherwise fails, to remove the shell, B′ from the hub, take out the keys and pitching pieces, remove the defective blade, and insert another in the same position.

The inventor of this important auxiliary to modern screw propulsion is Robert Griffiths, of London, England. It was secured by letters patent of the United States on April 7, 1857. Further information may be obtained by addressing C. W. Copeland, Esq., No. 64 Broadway, this city.

Not an ear of indian corn grows in "Ould Ireland," and yet Wm. Watt, of Belfast—as will be found on our claim page—gives us a *hoist* in making starch from this cereal.

The Power of Wind.

The air which we breathe is so light that one hundred cubic inches only weigh thirty-one grains, yet when driven at an immense velocity, it exerts a power which sweeps large ships to the bottom of the ocean, and levels forests and strong buildings with the dust. A wonderful demonstration of its power took place in Southern Illinois, at the village of Pena, on the 14th ult. A tornado, accompanied with hail and rain, destroyed a number of buildings—dashing them to pieces. It lifted up a large frame church entire, carrying it several feet distant, and it took a up a train of freight cars from the railroad track and shivered them to pieces. Several persons were also thrown high in the air, some of whom were killed.

Some theorizing philosophers have endeavored to prove that if a comet were to strike the earth it could do but little injury, owing to the attenuated nature of its matter. But the electric fluid is so light that the most refined experiments have not yet been able to discover whether it has weight or not, and yet its destructive power is terrific. The velocities with which bodies move is an indication of their force, and comets move with fearful speed—a velocity, in comparison with which, the speed of the tornado of wind that committed such devastation in Illinois is as the cricket ball to the musket bullet.

Lead Mines in Newfoundland.

At St. John's, in the above island, quite an excitement has broken out about minerals, in consequence of the large quantity of lead being got out of a mine near Placencia Bay, belonging to the New York, Newfoundland and London Telegraph Company.