Scientific American.

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THE
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Preserving Stone Work.

There are various kinds of stone which do not stand exposure to the weather, and this is the case with some of the dark brown free-stones employed for building purposes. It absorbs moisture, expands with frost, and then scales off with rains. Any cheap means to prevent the crumbling away of such stones should meet with attention. Linseed oil applied to such stones will protect them, but it imparts to them a dark and somber appearance. A method of protecting stone with a solution of silicate of potash is now extensively carried out in Paris. It has been tested at the Louvre, Notre Dame, and other important works, and with success it is stated. This solution is mauufactured by fusing 2 1-4 parts of clean white sand with one part of potash by weight, then dissolving the product in about 8 times its weight of boiling water. The stone work of the buildings to which it is to be applied, are first cleaned, then troughs hugged with clay are placed against the part of the building intended to be silicated, so as to collect the solution, which is applied with a syringe at intervals of three or four hours for about four days, or till the stone (when dry) ceases to absorb.

It is considered desirable that this process should be repeated, but to a less extent, the following year. The color of the stone is not materially changed, provided the absorption is tolerably equal and the silicalization effected by a sufficient number of applications of weak solutions, both of which conditions are necessary to success.

The phenomena of induration is thus explained:—The carbonic acid of the atmosphere separates the silica from the potash, leaving it deposited in the pores of the stone, when, should the carbonate of lime be present (as in limestone), it combines with it, and forms the silicate of lime, while the soluble salt—viz., the potash—is removed by the rain or other means.

This solution, we understand, was tried on the new Houses of Parliament, in London, but without that success, it is stated, which has attended the French artists.

Improved Wiring Machine.

The accompanying engraving illustrates a new Wiring Machine, by Shepherd and Stowe, which is now on exhibition at the great American Institute Fair, Crystal Palace, N. Y.

A is the frame of the machine, which carries the lower roller, and to which the frame that holds the upper roller, C, is hinged at D, allowing the frame, with its roller, C, to turn on the pin, D, in order to put in and take out the work. G is a crank screw, by which the roller, C, is depressed; the spring on top of the machine raises said roller. H is a forming gauge, and is set to form any circle, by means of the screw and gear, seen at E.—B is an adjustable gauge, fitted to the lower roller, J, and its shaft, and revolving with them. This gauge is set to take in wire of any required size, by means of the nut, F.

In wiring any vessel the work is placed between the rollers, C and J, fig. 2, and the gauge, B, moved up to press the work tightly between the surfaces of the rollers, C and J, and the gauge, B; the machine is then set in

IMPROVED WIRING MACHINE FOR TINSMITHS.

Fig. 1

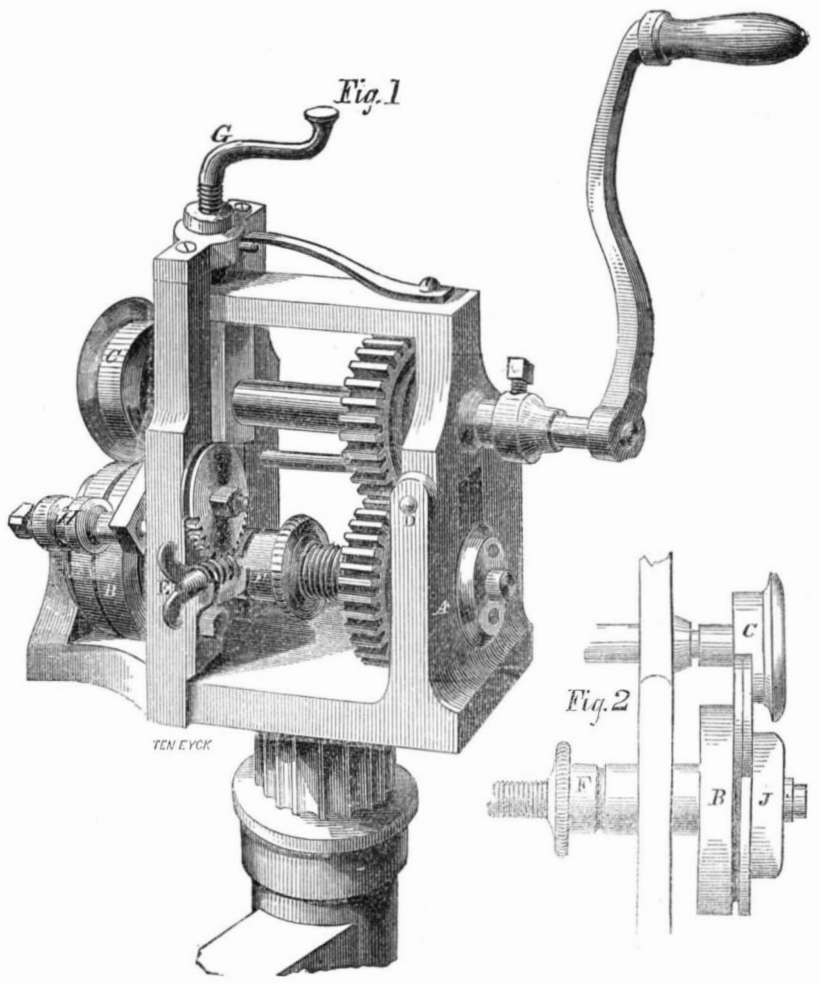


Fig. 2

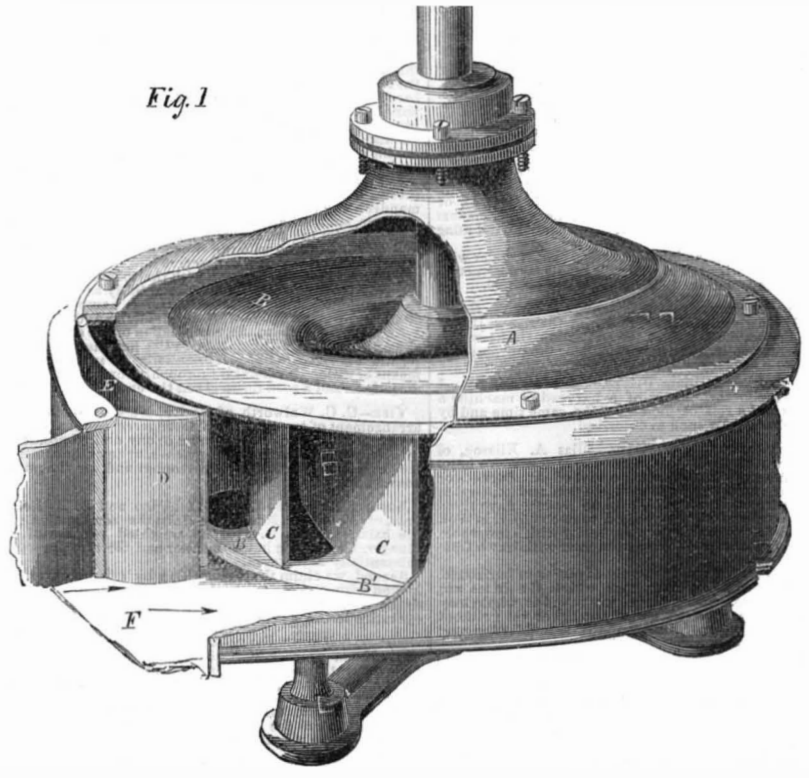
motion, when all these surfaces help feed the work through the machine.

By this improvement the friction on the fixed gauge, found in the old machines, is entirely removed, and work is fed through the rollers by all the surfaces on which it rests. So perfectly is this done that the work needs no aid from the operator in forcing it through the rollers in wiring even coal hods or the heaviest brass kettles. By hinging the frame of the roller C at D, a most desirable result is obtained for the durability of the machine, viz., that of keeping the boxes closely fitted to the journals of the upper roller while it is raised to put in and take out the work.

Different sizes of these machines are made at prices ranging from $14, worked by hand, to those fitted up with pulley and clutch, costing $50. For further information apply at the Palace, or address the Stowe Manufacturing Co., Plantsville, Conn.

NEW WATER WHEEL.

Fig. 1



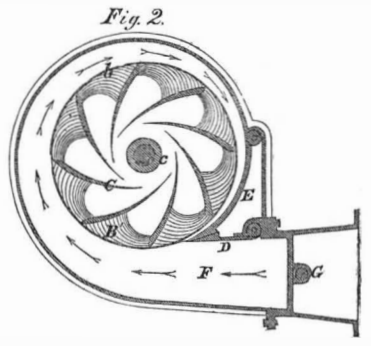
New Water Wheel

The only water wheel shown at the present great Exhibition of the American Institute Crystal Palace, in this city, is the invention of Mr. John Tyler, of West Lebanon, N. H. Our illustrations are taken from the operating machine at the Palace, where it attracts much observation from the large percentage of power which it affords, although the wheel is comparately small, being of two horse power.

Fig. 1 is a perspective view of the improvement, the shell, A, being partly broken away. Fig. 2 is a horizontal section of the wheel and shell, the upper portions being removed.

The wheel is enclosed by a scroll-shaped water-way, F, and is constructed in the following manner, to wit: draw a circle, *b*, corresponding with the periphery of the wheel to be constructed; then from the same center draw an inner circle, *c*, of only one-third the diameter of the said outer circle; then place the stationary leg of the compasses upon said outer circle, and so adjust the marking leg of the instrument that its point will form a tangential curve to the inner circle, *c*, which curve, when extended to the outer circle, *b*, will give the required shape of the convex surface of each of the buckets, C, and the relative position that each bucket should hold to the periphery and center of the wheel. The upper edger edges of the buckets, C, are cast in one piece with the head, B, whose under surface curves upwards and outwards, from the aperture in its center to its periphery, in lines whose radius corresponds with that of the periphery of said head. The lower edges of the buckets, C, are connected to each other by means of a rim, B′, whose inner edge is of scollop-shape. The said rim, B′, extends inwards, in contact with the convex surface of each bucket, a distance equal to about three-sevenths of the length of said surface, and from that point, curves outwards and downwards to a narrow connection between said rim, and the outer extremity of the concave surface of the next bucket in succession. The

Fig. 2.



object of giving the aforesaid shape to the rim, B′, is to conduct the water in a solid body from the water-way against the central portion of the convex surface of each bucket, and then as soon as it has performed its propelling function, allowing it freely to fall out of the wheel and not re-act upon the concave surfaces of the buckets.

The object of giving a curving or dish-shape, to the head, B, of the wheel, is to enable the water, as it enters the wheel, to exert an upwardly lifting action upon it, also cause the water to be kept in a compact mass, and to pass so rapidly and so cleanly through the wheel, that there can be no loss from the re-action of sluggish water between the buckets.

The lifting action of the water as it enters the wheel, will cause it to run more lightly, and consequently with a much less amount of friction.

In connection with this wheel there is an improvement in the water way, which consists in providing movable lips, D E, of such shape that their inner curved surface, E, brings the scroll to a point at the periphery of the wheel when the lips are closed, and whose straight surface, D, forms one side of the mouth, F, of the scroll water-way. The lips are both pivoted. It will be perceived that the pressure and friction of the water as it passes into the mouth of scroll water-way

will keep the lips closed. But should sticks or other obstructions be drawn into the wheel and be brought in contact with lip E, it will be thrown open and the obstruction will pass by, thus preventing injury to the curb or to the buckets of the wheel.

This improvement also enables the extremity of lip, D, to be brought much closer to the extremities of the buckets of the water wheel than it would be safe to do if it were a solid portion of the curb, which causes the water to act with greater efficiency upon the wheel.

We have seen testimonials from a number of persons who now have these wheels in use, and they all speak of the invention in the highest terms of commendation. Its extreme simplicity, portability, and ease of management will insure for it a very general use. It runs with great steadiness, is easily regulated, is adapted to high or low heads, runs in back water, is not liable to freeze up, has but little friction, only a short time and but little expense is requisite to put them in. Price $35 up, according to size. For further information apply at the Palace, or address the inventor as above. Patented July 8, 1856.

A suspension bridge is to be built from Cinnati to Covington, sixty feet in hight.

No less than 836,850 pounds of quicksilver were exported from California during the last six months ending July 1st.

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 30, 1856.

RING BOLT FOR SHIP'S AND BOAT'S TACKLE—Hubbard Bigelow and Mortimer M. Camp, of New Haven, Conn.: We do not claim an eye or ring bolt made in parts, that can be secured to or released from each other.

But we claim the tongue, C, the holdfast, D, and the levers, E E', as arranged in relation to the body, A, in the manner and for the purposes set forth.

SODA FOUNTAINS—J. F. Boynton, of Syracuse, N. Y.: I claim first, the described arrangement of the plunger, E, and vessel, D, or any other arrangement substantially equivalent thereto, whereby the acid may be measured and delivered to the other ingredients in determinate quantities, as set forth.

Second, the spring drip valve, b, or its equivalent, whereby the vessel, D, is entirely emptied of acid after a charge is worked off, as set forth.

UNCOUPLING R. R. CARS—Wm. O. George, of Richmond, Va.: I claim the arrangement of sliding rods running longitudinally beneath the platforms of railroad cars, so connected with the coupling pins of the different cars that they may be simultaneously detached from each other by simple contact of the sliding rods at the same time that the engineer or conductor is enabled to disconnect one or more of the cars, if desired, substantially in the manner set forth.

VEGETABLE CUTTERS—George W. Childs, of Liberty, Pa.: I claim the vibrating cross knives, h h, operating in the manner set forth.

SMUT MILLS—Joel W. Cormack, of Quincy, Ill.: I do not claim creepers, or flanges, or cones, in themselves, as new.

But I claim the combination of the cones, E, and creepers, c c, arranged and operating in connection with the flanged rims, J J J J, attached to the cones, H and M, in the manner and for the purpose set forth and described.

FOLDING PAPER—Cyrus Chambers, Jr., of Kennett Square, Pa.: I claim, first, causing a folding machine to make the crease for the fold in paper, or other substances, so that any number of sheets fed successively to the said machine may be folded to correspond to the printing or other impressions made thereon by means of the points or register pins, I I, or other equivalents, and the holes by which the sheet was registered upon the press, or the holes or marks made in the sheet for any other purpose, the said pins being adapted to the said holes or marks, and the sheet or substance to be folded placed upon the said pins by using the said holes or marks for that purpose.

Second, I claim the manner of adjusting the register pins, I I, and their peculiar movement, as described, for the purposes specified.

Third, I claim supplying the straight edge or blade, or its equivalent (which forces the paper into recesses or between converging surfaces or their equivalents) with fine points, as and for the purpose specified.

Fourth, I claim the bars, Q Q', and the stops, S, independent of and in combination with each other, as well as the bars, Q Q', or the stops, S, separately or combined as described, in combination with the endless belts T T.

Fifth, I claim arranging the rollers, B B', which make the second fold below the rollers, A A', which make the first fold and the rollers, C C, which make the third fold below B B, and in like manner any number of rollers, so that the substance to be folded may be forced downwards between each pair, thereby enabling a single series of endless belts or their equivalents, to conduct it from one pair of rollers and present it for the action of the next.

Sixth, I claim the fly, U, in combination with the endless belts, 2 2, and the mode of making the support of the said fly adjustable; also the manner of moving the said endless belt, substantially as described.

Seventh, I am well aware that endless belts have long been used for conducting paper in folding and other machines. Therefore I do not claim them as my invention.

But I claim arranging a single series of endless belts, substantially as described, so that paper or other substances may be conducted by them horizontally from a pair of rollers when passing downwards between them.

Eighth, I claim gearing the rollers in such manner as to decrease the speed of the periphery of each successive pair, in the proportion and for the purpose specified.

Ninth, I claim controlling the first blade or plate of folding machines by a treddle or other means, for the purpose specified.

HOSE COUPLING—Lewis M. Ferry, (assignor to J. T. Ames,) of Chicopee, Mass.: I do not claim any of the parts separately.

But I claim the combination and the application of the various devices described, for the purpose of coupling firemen's hose.

MIXING MORTAR—Benj. F. Field, of Beloit, Wis.: I claim the the of a revolving box of a cylindrical or other form made to ro upon the ground, for the purposes of mixing [illegible] by the action of the cross rods, substantially as described, whilst at the same time it serves to carry the material from place to place, in combination with the method substantially as described, for discharging the mortar from the revolving box.

FLY TRAP—George Gilbert, of Westville, Conn.: I disclaim the use of floats, ledges, or any other projections on the surface of the cylinder.

I also disclaim the use of a movable cleaner or wiper of any description whatever to remove the flies from the surface of the cylinder, or to force them into the box or any other receptacle, as neither projections nor cleaners are needed or used in my manner of constructing and using the fly trap

I claim the combination of the revolving cylinder with the screens or wire work, when the whole is constructed, arranged, and combined substantially as described.

ATTACHING SCYTHES TO SNATHS—David A. Goodnow, of Baldwinville, Mass.: I claim the screw, D, and dog, E, in combination with the projection, C, the whole being arranged in the manner and for the purpose described.

HARVESTERS—William Dripps. of Coatesville, Pa.: I claim giving to the cutters of a harvesting machine a traveling and a rotating motion, at the same time and by means substantially such as described.

HIDE FRAMES IN TAN VATS—Elias A. Eliason, of Georgetown, D. C.: I am well aware that hides have been immersed in quantities attached to frames, or wheels, or cords, in a horizontal position, and kept out of contact with each other, but in no instance have those several devices been connected to each other, in such manner as to form a frame or false vat by which the whole could be simultaneously immersed in or withdrawn from the liquor vat.

I claim, first, arranging a series of ranges of horizontal slats in a false vat or frame upon which the hides are placed one upon every range, whereby the whole may be simultaneously raised out of the liquor vat (without pumping off the liquor,) substantially as and for the purposes described.

Second, I claim the axial cross ties, D D, when connected with the frame, C, in combination with the hook-edrods, F F, and shaft, e, whereby the frame or false vat may be revolved or reversed for the purposes described.

BUOYS—William M. Ellis, of Washington, D. C.: I claim, first, the method described of moving buoys, beacons, and floating bodies, by having their cables attached to said bodies in the line of their calculated center of tidal pressure.

Second, the method of connecting the forked or V link or shackle to the said buoy or floating body by means of a trunnion bolt passing through a metallic tube or pipe properly set and secured within the said body.

ELASTIC PLATE PADDLES FOR STEAM VESSELS—Auguste Jouan, of San Francisco, Cal.: I claim the series of vertically divided elastic plate paddles, arranged as set forth.

BENDING WOOD—Edwin, Artemas, and Cheney Kilburn, of Burlington, Vt.: We claim the bending of wood by forcing it endwise of its fibers into a mold, which is closed on all its sides, but has an open end, is curved longitudinally in the required form, and has the dimensions of its internal transverse section of the piece of wood, thus causing the wood to be confined in a lateral direction during the bending process, for the purpose of preventing the separation of the fibers, as described.

FEEDING PULP TO PAPER MAKING MACHINES—Israel Kinsey, of Hohokus, N. J.: I claim regulating the flow of pulp for making paper upon the web or cylinder of the paper machine by the pressure of the pulp in a box, A, receiving its supply of pulp from the stuff chest, E, through the aperture, f, in the trunk, R, and discharging it through an adjustable aperture, p, below the surface of the pulp in the box, A, the pressure being regulated and kept uniform by the hight of the pulp, h, in the box, A, which is adjusted and maintained by means of a valve, e, fitting the aperture, f, operated by a float, B, substantially as described, the combination of the several parts forming a self-acting regulator, for the purpose of making paper of equal thickness.

MEASURING FLUIDS WHILE DRAWING—Saml. Krauser, of Reading, Pa.: I claim severing or separating a given quantity of liquid from a mass or column by a traveling tube and plunger, operating together substantially as set forth.

I also claim the gauge plates, N N N, in combination with the valve seat, or packing of the plunger fitting thereto for adjusting the measuring apparatus to the exact quantity to be drawn, substantially as specified.

PLATE-HOLDER FOR PHOTOGRAPHIC CAMERAS—Wm. Lewis, and William H. Lewis, (assignors to Malonzo J. Drummond,) of New York City: We claim forming the glass or vitrified corners, h, with a flanch or rim in one solid piece, the said flanch or rim taking the edges of the photographic glass, or other plate, substantially as and for the purposed specified, and irrespective of the manner in which the said vitrified corners are attached to the frame.

We als claim the receptacle, d, below the glass or other plate to catch any drippings from said plate, substantially as specified.

HARVESTERS—Israel S. Love, of Beloit, Wis.: I claim the use of the movable rolling guides placed between the cutting blades, and the sill of the harvesters, whether they be used with a sill made entirely of metal or partly of wood, with more or less metal attached to the same.

CLEANING WOOL—A. W. Putnam, of Brooklyn, N. Y. I claim the combination of the main picker cylinder, and the open and closed concave, in combination with the burring cylinder, arranged and operating substantially as described.

I also claim the burring cylinder in combination with the adjustable burring bar or bars, arranged and operating substantially as described, for stripping the burrs and other foreign substances on the fibers as described.

SASH LOCK—Owen Redmond, of Rochester, N. Y.: I claim the swinging bolt, B, in combination with the slide, S, and case, O, constructed, arranged, and operating as described, so that the gravity of the slide, shall shoot the bolt, and maintain it in position.

GLASS OR EARTHEN TRUSS PADS—C. C. Reinhardt, of Baltimore Md.: I claim the attachment of metallic backs to the glass faces of truss pads by a flange around the edge of the back slipping within the rim, constituting the edge of the glass face piece, substantially as and for the purposes specified.

CUTTING IRREGULAR FORMS—Charles Spofford, of Amesbury, Mass.: I do not claim the invention of a rotary cutter cylinder. Nor do I claim combining knives in any manner with a rotary cutter head or frame to hold said knives so that said head or any part of it may serve as a guide to the form or pattern carrying a material to be dressed.

I claim the combination of one rotary cutter, two guide heads, B and C, and two tables, G H, arranged as described.

I also claim the combination of a vibratory spring presser, I, with a rotary cutter stock, A, and two tables, G H, the said presser being made to operate with respect to the cutter stock and tables, and either guide, B C, as specified.

I also claim the combination of mechanism for moving the vibratory spring presser and its spring towards either of the tables, and locking the shaft to the spring, the same consisting of the arm, M, the two turning bearers, R S, and the treadle or lever, N, connected to the bearers by pitmans, O P, as described.

And in combination with the mechanism for moving the vibratory presser, and its spring towards either of the tables and locking the shaft to the spring, I claim the auxiliary treddle, T, applied to the main treddle, and supported by a swinging bar, substantially as explained.

FINISHING GAS PIPE FITTINGS—C. C. Walworth, of Boston, Mass.: I claim the arrangement and combination of the machines operating substantially as described, in a plane around a common center, for the purpose of screwing or tapping different ends of gas pipe fittings at the same time when connected by means of a wrist plate and slotted connections, or their equivalents, for the purpose of bringing the taps to their work, and yet permit either of them to advance or recede without interfering with the others.

NUT MACHINES—W. E. Ward, of Port Chester, Y. Y. I do not wish to be understood as limiting my claim of invention to the special form, construction, or arrangement of the several parts, as the same mode of operation may be obtained by the substitution of equivalents.

I claim the two punches arranged side by side, and operated substantially as described, for punching the central hole, cutting off the blanks from the bar, and discharging the same, substantially as described, in combination with the two holes or two dies, so that a hole is punched in the bar for another nut, during the continued motion of the punch to discharge the nut which was cut off during previous part of the same motion.

I also claim, in combination with the punching and cutting operation or either, and with the mandrel, or its equivalent for entering the central hole of the nut blank, the employment of the spring jaws or the equivalents thereof, for transferring the nut blank from the die to the mandrel, and there holding it until the mandrel enters the hole, substantially as described.

I also claim the holding of the nut blanks on the mandrel, in combination with the swages for swaging the faces of the nuts, substantially as described.

I also claim in combination with the mandrel for holding and turning the nut blanks, substantially as described, the employment of the hammers for hammering or swaging the edges of the nuts, substantially as described.

And, finally, I claim the combination of the swages for swaging the faces of the nuts, with the hammers for forging the edges of the nuts, substantially as specified, by means of which the metal is thoroughly compacted in all directions, and a good finish given the entire blank.

VISE—C. C. Walworth, of Boston, Mass.: I claim the arrangement of two vises so as to revolve about a common center, and locking the same in any desired position by means of the lever, G, and notches, or any other suitable device, substantially in the manner and for the purpose set forth.

BRICK MACHINES—G. J. Washburn and E. H. Bellows, of Worcester, Mass.—We claim the combination of the balanced arm, L, with the weighted reciprocating plunger, I, operating in the manner and for the purpose substantially as set forth.

Second, we claim the means by which the plunger is locked with, and disconnected from the cylinder, D, consisting essentially of the pins, f and g, and the arms, o, operating in the manner substantially as described.

CUTTING ROUND FILES—M. D. Whipple, of Charlestown, Mass., assignor to A. B. Ely, of Newton, Mass.: I claim operating upon the blank immediately beyond its point of support, in the manner and for the purpose substantially as described.

Second, I claim feeding the blank forward and rotating it upon its axis as the cutting proceeds, when it is operated upon by the vibrating cutters, in the manner substantially as set forth.

Third, I claim the method described, of operating the cutters by means of the wipers, b, and the springs, A2 and Z, whereby the force of the blow is diminished as the size of the blank decreases, as set forth.

Fourth, I claim forming the cutters of circular disks or of portions thereof, in the manner and for the purpose substantially as set forth.

BRACKET FOR DOOR SPRINGS—A. J. Walker, of New York City: I do not claim the application of steel rods to doors to act as springs.

I claim constructing one of brackets, used for attaching such rods, with an additional hole for receiving and holding them when in operation, said additional hole bearing such a relation to the first that by changing the spring from one to the other, greater nicety can be observed when applying it, in regulating the power with which it shall act, and of attaching to said bracket a lever to assist in twisting the spring when applying it.

I also claim securing said bracket in its place by means of a socket inserted in the door or casing, or any other means substantially the same, that will instantly secure it, after it has been applied to the spring, and the necessary power obtained, and will also allow of its being easily removed and re-attached when it is desirable.

HOOP MACHINE—W. B. Wood, of Fitchburgh, Mass.: I do not claim splitting hoop poles by forcing them against the edge of r stationary knife. Nor do I claim shaving them by means of revolving cutters. Neither do I claim any of the individual devices employed, nor their combinations.

But I claim the peculiar arrangement of the several parts of the described machine, operating in the manner specified, for the purpose of splitting the poles and shaving the hoops at one operation, as set forth.

PINCERS FOR LASTING BOOTS AND SHOES—Benj. F. Sturtevant of Skowhegan, Me., assignor to E. Townsend, of Boston, Mass.: I do not claim a lasting tool in which the two sets of jaws are brought together by means of a screw, as this is a well known method of constructing such tools.

I am also aware that the exterior jaws of such tools have been caused to close upon a central step or block, thus forming a species of compound pincers or lasting tool.

But I claim the described instrument for lasting boots constructed and operating in the manner substantially as set forth.

MILL STONE DRESS—W. P. Coleman, of New Orleans, La.: I do not claim a circle dress or curved furrows, the radii of which are equal to the radius of the stone or thereabouts, nor yet the straight tangential furrows, of themselves or apart from their relative arrangement, combination, and operation together in the two stones.

Neither do I claim of itself the curved furrows arching in opposite directions in the two stones, and gathering in the grain towards the eye.

But I claim forming the master and subordinate furrows, C D, of the stones, substantially as described, viz., the straight portions of the furrows being tangential with the eye, and with circles concentric therewith, and the curved portion being segments of a circle of equal curvature, or thereabouts, so that of the outer peripheries of the stones for the purpose of rapidly throwing the grai outwards in the early action of the furrows, and retarding or gathering it in by the after or outer portions thereof, as set forth.

COILED SPRING FOR R.R. CARS—Carlos French, of Seymour, Conn.: I claim composing the coiled leaf of two or more leaves placed the one below the other, said component leaves being welded together at one or both ends thereof, substantially as set forth.

RE-ISSUES.

BURNING WET FUEL—Moses Thompson, of New Orleans, La. Patented April 10, 1855: I do not claim the described arrangement of a series of fire chambers to communicate with one common flue irrespective of the purpose for which, and the manner in which I employ th said arrangement.

But I claim the combustion for the purposes of a high degree of heat of bagasse, refuse tan, saw dust, and other wet refuse substance or very wet and green wood. by the employment of a series of fire chambers arranged in any manner substantially as described, to communicate with one common flue or mixing chamber, when any number of said chambers are nearly closed to the admission of air when first charged, as described, whilst the remaining chamber or chambers, is in full communication with the flue, and has a free supply of air admitted, and the ash pit of each chamber, in its turn, is nearly closed and then opened, and has air admitted, whereby the heat required is rendered continuous and comparatively uniform, while the fuel in some of the chambers is being heated and decomposed to a desirable degree, as set forth.

BUFF FOR POLISHING SPOONS—Luther Boardman. of East Haddam, Conn. Patented Dec. 15, 1843: I claim a cylindrical buff composed of soft leather disks or rings, when the outer portions of said disks are left perfectly free from each other, so as to admit of the yielding necessary to their proper action, substantially as described.

HAT BODIES—Chas. St. John, H. A. Burr, Albert H Wright, and J. M. Riblet, of New York City, assignees of H. A. Wells, deceased. Patented April 25, 1846: We do not wish to be understood as limiting the claim to such mode of application, as other modes may be devised, operating on the same principle, or having the same mode of operation, and only differing therefrom in the substitution of equivalent means.

We claim forming the bat of fur fibers on a perforated cone or other form, substantially as described, in combination with the hardening of such bat, while on such cone or other form, to give it the required consistency to admit of taking it off in a suitable condition for sizing by the well known process of felting, substantially as described.

DOOR LOCKS—J. P. Sherwood, of Sandy Hill, N. Y., assignor to Calvin Adams, and re-issued to said Sherwood. Patented December 17, 1842, and re-issued to said Adams May 13th, 1851: I claim making the cases of door locks and latches doubled faced, or so finished that either side may be used for the outside, in order that the same lock or cased fastening may answer for a right or left hand door, substantially as described.

I also claim the peculiar construction and double action, upon an inclined and horizontal track or way, of the locking car, B, as described, and the combination of the locking car, B, and safety cars, G G2, with one another, and with the connecting or vibrating bar and bolt, A, as described, so as to fasten the bolt, c, securely, and prevent its being picked.

I also claim so constructing the bolt, as described, that by simply turning it over in the lock case, it is adapted to a right or left hand door.

DESIGNS.

COOKING STOVES—Daniel Wilson, of Nashua, N. H.

CYLINDRICAL COAL STOVES—Russel Wheeler and S. A. Bailey, of Utica, N. Y.

COOKING STOVES—H. E. Bridge, of St. Louis, Mo.

BUST OF J. C. FREMONT—John Gott, of Albany, N. Y.

STOVES—N. S. Vedder and W. L. Sanderson, of Troy, N. Y., assignors to North, Chase, and North, of Philadelphia, Pa.

STOVES—S. W. Gibbs, of Albany, N. Y., assignor to North, Chase, and North, of Philadelphia, Pa.

PARLOR STOVES—Jacob Beesley and E. J. Delaney, (assignors to Cresson, Stuart, and Peterson,) of Philadelphia, Pa.

COOKING STOVES—N. S. Vedder, of Troy, N. Y., assignor to Graff, Reisinger & Graff.

COOKING STOVE PLATES—N. S. Vedder (assignor to Mann, Torrance & Co.,) of Troy, N. Y.

STOVES—Garrettson Smith, Henry Brown, and J. A. Read, of Philadelphia, Pa., assignors to Hayward, Bartlett & Co.

Francis' Metallic Boats in England.

Renewed experiments—we learn by the London *Mechanic's Magazine*—have been made recently with the above-named boats at the Woolwich Arsenal. These were very satisfactory, and the authorities, Sir G. Pollock Sir F. Abbott, Gen. Brooke, and Col. Tulloch, expressed their decision of urging the government to adopt them for every purpose to which they can be applied.

Air Boiling of Iron.—Another Claimant.

MESSRS. EDITORS—In November, 1851, I commenced a series of experiments with a view of converting fluid pig metal into malleable iron, with the aid of a strong blast of air, and without the use of fuel, which process I termed "air boiling." My object was to drive off the carbon in the iron, and to make powerful blasts of air do the work of the fire and the manipulation of the puddler's bar in the puddling process. My first efforts were quite satisfactory, as with a blast taken from my furnace and introduced into a suitable cupola filled with liquid metal taken directly from the furnace I produced a fair article of malleable iron. I found when using gray iron cold blast answered my purpose, but when the metal was white I found hot air had a better effect. I therefore had a small furnace erected to heat the air in the blast pipes.

My experiments were conducted publicly at this establishment; hundreds of persons called to see the trials I made, and the subject was discussed amongst the iron masters, &c., of this section, all of whom are perfectly familiar with the whole principle and object I had in view, as discovered by me nearly five years ago.

I was surprised to notice in the SCIENTIFIC AMERICAN of the 13th Sept. an account of a similar process of converting pig iron into malleable iron, claimed as the discovery of Mr. Bessemer, of London, and made within the past two years, the process not differing in the slightest from that I had in practical operation nearly five years since.

I have reason to believe my discovery was known in England three or four years ago, as a number of English puddlers visited this place to see my new process. Several of them have since returned to England and may have spoken of my invention there.

A charcoal furnace such as I have—using cold blast—produces various grades of metal, that I found had to be treated in the air boiling process with some variation; this caused difficulties which I have succeeded in removing, and expect shortly to have the invention perfected, and bring it before the public.

WILLIAM KELLY.

Suwanne Iron Works, Eddyville, Ky., 30th Sept. 1856.

Bessemer's Process.

Having been solicited to give some expression to my views of Mr. Bessemer's method of convertiug crude metal into steel or wrought iron. it may not be inappropriate to do so through the columns of your valuable journal. Mr. Bessemer furnishes a clear and detailed description of his apparatus, method of treatment by atmospheric air, informing us of the chemical changes produced, and claims the resulting product to be at the pleasure of the operator, "fine steel, or masses of malleable iron perfectly free from any admixture of cinder, oxyd, or other extraneous matters," equal in quality to charcoal iron.

Iron or steel, perfectly free from any admixture of cinder, oxyd, or other extraneous matters; in other words, absolutely pure iron, is not the article those engaged in their manufacture should seek to produce.

Let us, for illustration, examine the chemical composition of a few varieties of iron and steel, and ascertain whether Mr. Bessemer's proposition, that the nearer absolute purity we approach in the production of iron, the more useful qualities that iron will be possessed of.

The following table represents the chemical structure of several kinds of iron and steel, viz., No. 1, English gray cast-iron; No. 2, English refined; No. 3, Danemora Swedish; No. 4, German; No. 5, English common steel; No. 6, English, best razor steel :—

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6
Iron,	94·63	98·90	98·78	99·87	97·94	93·80
Carbon,	2·60	0·41	0·84	0·09	1·72	1·43
Sulphur,	0·35			trace		1·00
Phosphorus,	0·39	0.40				
Silicon,	1·53	0·08	0·02	0·03	0·22	0·52
Arsenic,			0·02		0·07	0·93
Antimony,						0·12
Manganese,	0·50	0·04	0·05		0·02	1·92
Copper,			0·07			
Nitrogen,						0·18

Here we find that the English crude iron approaches nearer metallic purity than the best English razor steel; and the Swedish, possessing less purity than English refined iron, yet capable of sustaining over 72,000 pounds to the square inch, while the latter breaks at about 55,000; and the German iron, which is the nearest approach to absolute purity, although possessing fibers, is so soft and weak, as to be of less value than either.

For one, I must state that experience has heretofore taught, that the quality of the manufactured iron depends more upon the description of ore and fuel, made use of in its first production, than upon the manner of subsequent treatment. It is in the blast furnace, and not afterwards, that the character of the iron produced is determined. The superior qualities of the Swedish Danemora iron are alone due to the peculiarly fine magnetic ore from which it is manufactured, and not to the manner or method of manufacture. Other districts in Sweden produce iron by the same process, and from a somewhat similar magnetic ore, but their products will not bear comparison with the Danemora in mercantile value. It is to the Danemora iron Mr. B. refers, as selling in England at thirty pounds sterling per tun, the future sales of which are to be estopped by his invention. There are many cases in which wrought iron contains a larger proportion of impurities than crude iron, and is yet malleable and useful, while cast iron of the same chemical composition will be extremely hard and brittle.

Berzelieus, the celebrated Swedish chemist, informs us that he det ected eighteen per cent. of silex in a certain kind of bar iron, and that this iron was still malleable and useful. One-tenth of that amount of silex will make crude iron brittle. The best qualities of bar iron are always found to contain a small amount of impurities. Steel ceases to be hard and strong if we deprive it of the small amount of silicon it contains, or if by repeated heating that silicon becomes oxydized. This is the case with bar iron. Deprive it of all foreign admixtures, it ceases to be strong, tenacious, beautiful iron, and becomes a pale, soft metal, of feeble strength and of doubtful utility. The main difference between crude and malleable bar iron consists in their mechanical, rather than chemical structure. Crude iron is a mixture of impurities and metal, both chemically and mechanically combined, where the atomatic crystals are found in intimate contact with each other, and in which a transformation to an entirely chemical admixture is readily effected. Wrought iron is a mechanical mixture of iron more or less pure, with a mass of homogeneous impurities or cinder, the latter filling the spaces between the particles of iron. Iron, in a connected form, and cinder in separate cells, are thus blendid in one homogeneous mass. The more this is stretched, either by the hammer or rolls, the more fibrous it becomes, and other circumstances being equal, the strength of the iron will be proportional to the fineness of the fibers.

Mr. Bessemer appears to congratulate himself upon the excessively elevated temperature that he obtains in the latter part of his operation, or after the entire consumption of the contained carbon; in plain terms, by oxydizing or burning the iron. This oxyd, we are told, from the elevated temperature that the metal has acquired as soon as formed, undergoes fusion, and forms a powerful solvent of those earthy bases that are associated with the iron. I am at a loss to comprehend how this is effected; having heretofore supposed that the melting of such an oxyd could not be effected at any temperature in an oxydizing flame, which Mr. Bessemer's clearly is. This immediate melting of the oxyd, as described, I cannot deem other than a physical impossibility.

The lower the temperature that crude is worked at, the better will be the quality of the wrought iron produced. Good bar or wrought iron is always fibrous, it loses its fibers neither by heat nor cold. Time may change its aggregate form, but its fibrous quality should always be considered the guarantee of its strength. Fine malleability and fibrous structure can only be given to iron by a tough cinder and manipulation. Mr. Bessemer does not pretend to do this, but rather rests upon the demonstration of his ability to produce a crystaline metal, which, although free from either carbon or cinder is not known to possess any practical value, and which, leaving his apparatus in the chemical state he alledges it to be in, I have no hesitation in asserting that it cannot be hammered or rolled sufficiently to produce any fiber, and all subsequent improvement of its quality will prove to be extremely difficult.

From the remotest antiquity down to the present day, wrought iron, unsurpassed in quality has been produced by one manipulation direct from the ore, but the great consumption of fuel and labor attending this method of manufacture, has enabled the blast, and puddling furnaces to supersede it, excepting where quality is of greater consideration than quantity. Men of the first scientific attainments have, of late, given expression to the opinion, that the blast and puddling furnaces, are soon to be superseded by the introduction of improvements upon the direct method of producing wrought iron.

Such improvements have been made and can now be seen in operation under my charge at the works of the American Magnetic Iron Co. at this place. J. G. MINER.

Mott Haven, N. Y., Oct. 7, 1856.

Refining Iron.—The New Process.

Since the first announcement of this discovery by Mr. Bessemer, the matter has been taken in hand experimentally by a leading American iron-master, assisted by a distinguished chemist, but the results thus far do not confirm the high anticipations which some have entertained. The most carefully performed experiments on this side of the Atlantic have utterly failed to produce *fibrous iron*, and the specimens sent over from England as fibrous iron, do not, upon examination, possess this character.

The Locomotive Explosion.

MESSRS. EDITORS.—I have been to the Boulton station of the Baltimore and Susquehannah, or Northern Central Railroad, where I had opportunity to examine the character of an explosion that occurred on the morning of the 1st inst., to one of their engines. The fracture was at the upper edge of the bottom sheet, on the right side of the fire-box, running about two feet along the rivet line, and tearing irregularly down about 12 to 14 inches, opening an area of about two and a half square feet. The sheet, along the rivet line, does not average more than one-eighth inch in thickness, while it was originally five-sixteenths or perhaps three-eighths.

Great heat and galvanic action between the copper sheet and the iron of the rivets and stay-bolts, had been doing this work till a great reduction of thickness under the rivets, and destruction to a great extent of the screw threads connecting the stay bolts, had taken place; there was also a great deficiency of head to the stay bolts, which afforded, as a whole, an abundant cause for this disaster.

Mr. Winans, the builder, and the master of machinery, were present, and seemed to console themselves with the remark that "it was one of those unavoidable and unaccountable accidents that no one could guard against." With all deference to the authority, I must protest that it is one of those cases that *could* and *should* have been guarded against, and I am strengthened in this opinion by the remark of the master of machinery, that "within a week it would have been overhauled, that they knew it needed repair."

The fact is, the boiler thus weakened was given over to the fireman to get up steam for an early start. There are now no external means of knowing the stage of water or the condition of the safety valve: he probably built a strong fire, and with steam even above the ordinary pressure may have been renewing the fire with a fast valve, and without a pressure gauge, when the explosion occurred. The fireman was thrown several yards from the engine, and it is supposed was instantly killed. The engine was capsized. "Nobody to blame."

I repeat what I have before written, and what every new examination of such disasters confirm; it is not necessary that another steam boiler explosion should ever occur. Science, experience and skill have made the path of safety plain, and only ignorance, neglect, or fool-hardiness will ever leave that path, and it is time engineers and pretenders to science ceased to gull the public with the idea of unavoidable explosions. JOSEPH E. HOLMES.

Baltimore, Md., Oct. 2, 1856.

Locomotive Engines for Propellers.

On page 188, last volume SCIENTIFIC AMERICAN, we illustrated the application of high pressure steam, on the locomotive principle, to the propulsion of propellors, according to patent of Capt. Whittaker, of Buffalo, N. Y. The advantages, in comparison with paddle wheels were pointed out, and the economic results of the side propellers of Capt. Whittaker, applied to the steamer *Baltic*, on Lake Erie, were given. In previous articles we had expressed the opinion that this mode of propulsion impressed us favorably, and we directed the engineering fraternity at home and abroad to examine it thoroughly. We are not aware that any attempts have been made in New York, or any of our Atlantic cities, to apply this principle of propulsion, but from the Leeds (Eng.) *Mercury*, we learn that it has recently been applied there. It says :—

"An interesting trial lately took place at the Railway Foundry, Leeds, in the presence of the Government Inspector, and other scientific persons, of a novel application of locomotive high-pressure machinery to marine purposes. The machinery, which has been arranged and completed from designs of the engineer of the works, is intended, we understand, for a screw steamer recently launched at Hull. Nothing could apparently be more admirable than the smoothness and facility with which the machinery worked, a speed of 120 revolutions of the screw shaft per minute being obtained from the direct action of the engines, without the intervention of multiplying gear. This quickness of piston motion, which is not attainable at low pressure, is one of the main advantages of the application. Another is the great saving of space and weight, amounting to more than one-half.—But what seemed to excite admiration most was the ease and quickness with which the motion was reversed, which was repeatedly effected under unfavorable circumstances, and against the full steam pressure of 140 lbs. on the inch, seven or eight times within thirty seconds. Upon the whole, it is not too much to say that this very admirable arrangement bids fair to supersede all other applications of steam power to marine purposes, especially for screw steamers."

The views presented in this extract are similar to those expressed in our columns, and the engineer who designed the machinery for the Leeds steamer has probably seen and read the illustrated article referred to above.

Strychnine, its Tests.

Prof. Horsely, of England, has tried experiments with strychnine on rats and dogs, and in some cases was unable, by any of the usual tests, to detect the poison. He is of opinion that it combines, in some cases, with the albumen, or other solid matter, in the body, and forms an insoluble compound. He has, however, discovered a most beautiful and simple test for it, which will always detect it when not combined with organic matter as an insoluble compound.

The test is, one part, by measure, of the bichromate of potash dissolved in fourteen parts of water and two parts of strong sulphuric acid. By adding a few drops of this solution to another, supposed to contain strychnine. If the poison is present, a precipitate of a golden color will be formed, which is an insoluble chromate of strychnine. This test is exceedingly sensitive, and can detect very minute quantities of strychnine in any solution.

The National Fair.

The United States Agricultural Association held its grand Exhibition at Philadelphia last week. The display of animals was good, but it is a fact to be regretted, that this Society depends most for success at its Fairs upon races and cavalcades of men and women on horseback.

New Cement.

A little ground borax mixed with plaster of paris makes an excellent cement for many purposes. It is simply mixed up into a plastic consistency, then applied with a trowel.—It soon hardens.

New Inventions.

Traveling Steam Railroad.

Our foreign English cotemporaries are loud in their praises of the steam carriage of Jas. Boydell, of London, for drawing heavy loads over bad roads, for plowing, and for many other purposes. It has detached parts of flat rails on its wheels, and as these turn, the rails form bearings which prevent the wheels sinking into the soft soil. It is stated to have been very successful in plowing. The farmers on our prairies, who are anxious to get steam plows, will derive some information respecting the nature of this tramway steam engine by examining an engraving of such a carriage, illustrated on page 353, Vol. 3, Scientific American.

Perpetual Motion.

We have frequent inquiries respecting a prize said to be offered by the British Government to the person who first discovers perpetual motion. No such reward has been offered —and if it were offered it never could be obtained for such a discovery will never be made. A perpetual motion is a machine which has an inherent power, to set and maintain itself in motion—a mechanical impossibility.

Improved Blower Engine.

The invention herewith illustrated is now on exhibition at the great American Institute Fair, Crystal Palace, New York. It refers to blower or pumping engines, and consists in actuating the valve rod by a yoke and weights as follows:—

Fig. 1 is a perspective view of the entire machine. Fig. 2 is an enlarged sectional view of the yoke, and adjuncts. G is the air cylinder discharging into chamber H, from which the blast proceeds to the furnace. F is the steam cylinder. The piston rod, *f*, operates in the usual manner, and has in its center a cross-head, C, which is furnished with a head plate, *i*. The lower part of cross-head C carries a roller, *m*. On the inner face of yoke D are cams, *t t' t''*. The yoke is so formed that the head piece, *i*, of the cross-head will move in the grooves of said cams.

Passing through the extremities of the yoke, D, are rods, *r r*, to the lower ends of which are attached weights, *c' c''*, the rods passing through the short arms of levers, *d' d''*, and connecting the weights therewith. These levers have a common fulcrum at *e*, and have weights, *f' f''*, hung to their long arms, The rods, *r r'*, are prevented from slipping through the levers by nuts, *i'*, and the upper ends of these rods are provided with threads on which are nuts, *i'*, to regulate the downward movement of the said rods through the ends of the yoke. The roller, *m*, passes beneath and in contact with the levers.

The head piece, *i*, by pressure on the under edge of cam *t*, lifts the right hand end of yoke D, and through rod E, opens the valve and lets on the full head of steam. The piston continuing its movement, the head piece, *i*, leaves cam *t*, passes up cam *t'*, mounts upon the upper edge of cam *t''*, and passing on, encounters the under edge of rim *w*, against which it presses, slightly, lifting the left hand end of the yoke in its course and producing a movement of rod *r*, which cuts off the steam, the weight, *c''*, acting with it to depress the opposite end of the yoke. As the head piece, *i*, leaves cam *t''*, the weight, *c''*, falls to its seat, depressing the end, *r'*, of the yoke sufficient to permit the cam, *t''*, to clear the head piece, *i*, and at the same time producing a movement of rod *r*, which lets on a small quantity of steam to the opposite side of the piston, which then begins its reverse travel; the upper edge of head piece *i*, by action on the under edge of cam *t''*, lifting end *x*, of yoke, and causing the full head of steam to be let on. The head piece is then passed over cam *t*, strikes rim *w*, lifting the other end *x*, of yoke, and effecting the cutting off of the steam. Then leaving cam *t*, weight *c'* drops to its seat, depressing end, *x*, of yoke sufficient to produce the letting on of steam to the opposite side of the piston, and bringing the head piece to the under edge of cam *t*, where it effects the lifting of that end of yoke D first mentioned.

The quantity of steam let to the piston at as the weight drops to its seat. If the nut be far removed from the end of the rod, the fall of the weight must carry the yoke with it, and a greater opening of the valve be produced. It will therefore be seen that by means of the nuts, *i'*, the quantity of steam first let to the opposite side of the piston is regulated.

The weights, *f' f''*, lift the weights, *c' c''*, and elevate the rods, *r r'*, as their respective ends of the yoke rise, so that the nut of the elevated rod will just come in contact with the end of the yoke at the termination of its upward movement. By this construction, the weights, *c' c''*, are elevated to the position necessary for their action, the roller, *m*, acting on the under edges of the long arms of the levers, causes the cross-head to lift the counterpoise of the weight about to be brought into action.

If the engine be a vertical one, springs may be used instead of the weights, and other modifications made in the construction which will adapt the several parts to the new condition without affecting the principle of action. This construction may also be applied to pumping engines.

The advantages of this engine are numerous and important, and will be readily appreciated by those acquainted with blast furnaces; the most prominent being the maintaining of a more uniform blast than can be effected by fly wheel engines: the sinking at the change of motion being appreciable.

A working engine, on a small scale, is exhibited at the Palace, and attracts much attention by its beauty of finish and exactitude of movement. The invention has been in practical use for some months past, at a furnace in Pennsylvania, and we are informed, has proved to be greatly superior to the common blower engines. For further information apply at the Palace, or address the inventor, J. P. Ross, Lewisburg, Union Co., Pa. Patented Jan. 22, 1856.

IMPROVED BLOWER ENGINE.

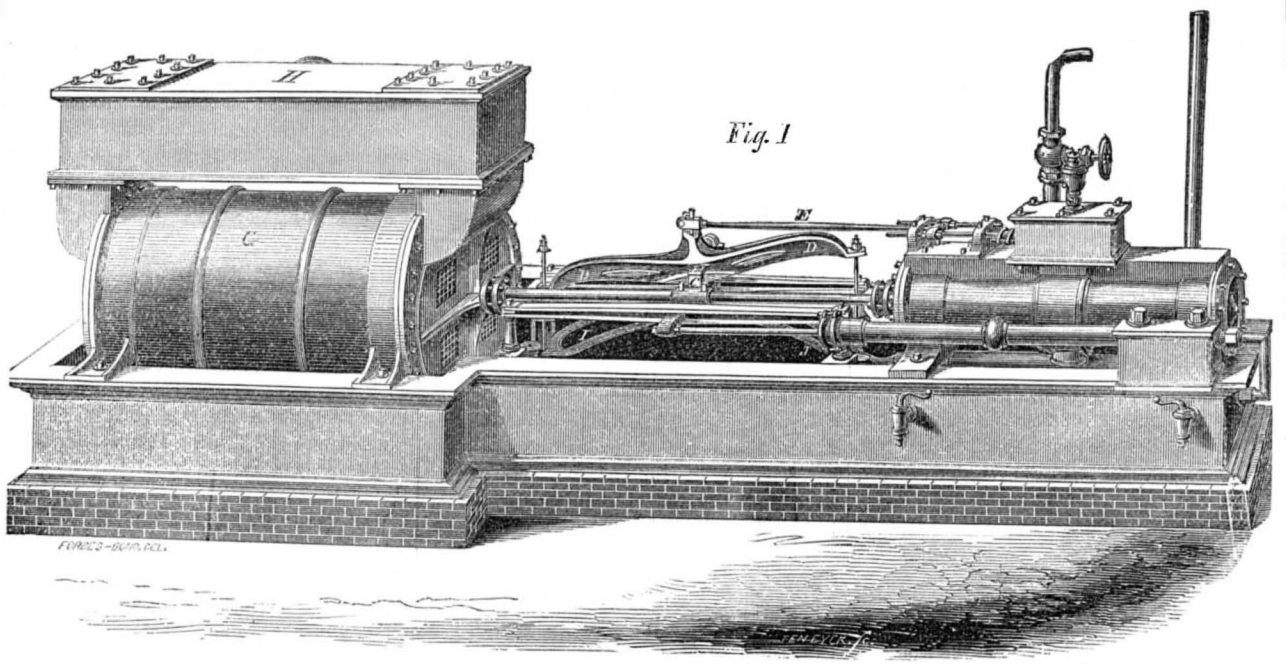


Fig. 1

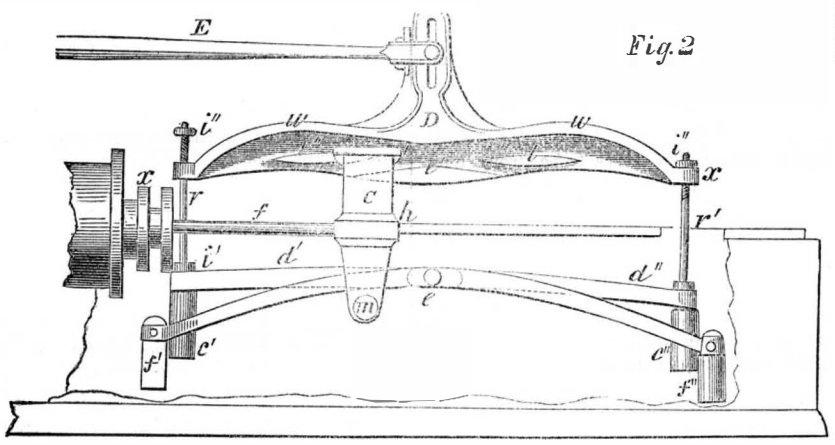
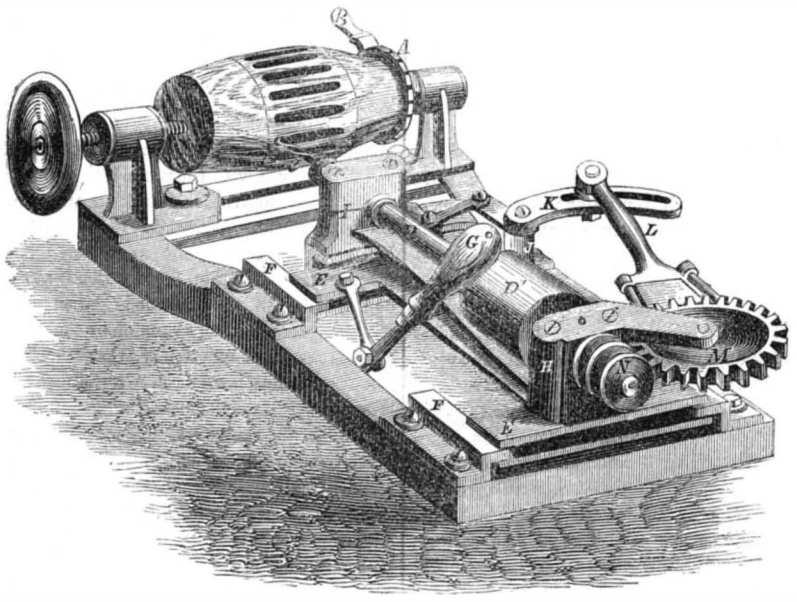


Fig. 2

HUB MORTISING MACHINE.



Hub Mortising Machine.

Our engraving illustrates a machine for mortising hubs, which is now on exhibition at the American Institution Fair, Crystal Palace, in this city. It is the invention of T. R. Bailey, of Lockport, N. Y., and was patented Aug. 5th, 1856.

The hub is centered between two bearings in the ordinary manner. One end of the hub bears against an index wheel, A, whose periphery is notched, and into the notches a spring, B, presses, which holds the index wheel firmly and prevents it from revolving. The hub cannot turn unless the spring, B, is pushed back, out of the notches, for wheel A and the hub revolve together. The notches are equi-distant, and correspond, in number, to the number of mortices to be made in the hub. It is therefore only necessary to move the index wheel, A, for a space of one notch, after each mortise is made, in order to cause the mortises to be all cut at exactly equal distances apart upon the hub.

The mortising tool, C, which has peculiar auger-shaped edges that bore and also cut sidewise, is attached to the pulley shaft, D, and power is applied, by belt, to pulley, D'. The mortising tool, C, and shaft, D, are supported in a carriage, E, which slides forward and back on guides, F. This movement is imparted by the attendant who pushes the lever, G, for that purpose, and thus carries the mortising tool against the hub, or withdraws it, at pleasure.

The proper formation of hub mortises is beveling, *i. e.*, narrower at their inner ends than on the periphery of the hub. In order to cut such mortises, one of the bearings, H, of shaft, D, is pivoted, while the other bearing, I, slides laterally. The required lateral movement of I is caused by a self-acting arrangement of parts as follows: K is a bell crank, having a pivot on standard J. One end of the crank, K, is attached to carriage E; the other end connects with a cam rod, L, the cam being attached to gear wheel M, and located below it. Gear wheel M is revolved by the screw, N, on shaft D. The cam turns with each revolution of M, acts through rod L, on crank K, and thus gives the lateral motion to tool C, necessary to impart a beveled shape to the mortise. Crank K is slotted at that point where it connects with rod L, in order to permit an adustment or variation at pleasure, in the extent of lateral movement given to tool C.

This machine is strong, simple, and compact in all its parts, and does excellent work. Any sized hubs may be mortised with great exactness and rapidity. By removing the standards at the head of the machine on which the hub is centered, a rest or table can be substituted, and the machine used for various species of mortising work. For further information apply at the Palace, or address the inventor at Lockport, N. Y.

Scientific American.

NEW YORK, OCTOBER, 18, 1856.

Steam versus Water Power.

Various correspondents have made inquiries respecting the relative value of steam and water power; and one asks:—"Whether an inexhaustible water power or only water sufficient for steam purposes, with an unlimited supply of cheap fuel, are most advantageous to the developement of a manufacturing town."

It is not possible to give a satisfactory reply to a general inquiry respecting the comparative advantages of steam and water power, but we have no hesitation in answering the correspondent (in Iowa) from whose letter we have quoted the above extract. An abundance of cheap fuel and steam power, in our opinion, possesses the greatest advantages for manufacturing purposes. Few manufacturing operations can be carried on without fuel, even where there is plenty of water power; therefore where fuel is scarce and dear, manufacturing cannot be carried on but under a heavy expense.

In giving this opinion we do not forget that most of our manufacturing towns and villages are indebted for their rise to water power. They are built on rivers and creeks where there are falls of water for driving machinery, but when they were first established, timber for fuel and building was plentiful and cheap in their neighborhoods. It has now become a serious question with many manufacturers, using water power, that their supply of water is becoming more unstable every year, as the forests are cleared off; and in many places where water power was exclusively used a few years ago, auxiliary steam power is required during certain portions of the year, on account of a deficient supply of water.

Forests and swamps are perrenial feeders of creeks and rivers. As these disappear, and the soil is spread out to the direct rays of the sun, rapid evaporation takes place after falls of rain, and thus it has occurred that many streams once flowing with power for the miller are now only water-worn channels. The ruins of grist and saw mills are now to be seen on the banks of dry creeks, where forty years ago the merry clatter of the hopper and hum of the saw mingled from morn till night with the song of the rushing waters. But although this is true respecting a number of places, manufactures have not decreased in our country, thanks to the power of steam.—With a plentiful supply of fuel, steam forms a constant trusty power for driving machinery, and a steam factory can be erected independent of rare natural localities, like water-falls. It has thus great advantages over water power. It requires 180,000 cubic feet of water per hour on a 13 feet fall, to produce the same effect in driving machinery that can be obtained with 50 cubic feet of water and 300 lbs. of coal, by a steam engine. While the power of water for manufacturing purposes is growing weaker and weaker in our country, that of steam is growing stronger and stronger. We have read a statement that in the year 1800 there were only three steam engines in all the United States; who can count them now? They number tens of thousands. Steam factories can be conducted in or near cities and commercial marts, and thus effect a great saving in transporting raw material and goods. There are various manufactures, however, which need considerable water to carry on, such as calico printing, bleaching, carpet-weaving, woolen cloth making, &c. The scouring, washing, and dying require much water, but then with steam such factories can be heated, the goods boiled and dried, and taking the expense of keeping dams and water wheels in repair, we are of opinion that steam power, where fuel is cheap, is to be preferred in nearly every case to water power. At any rate, there can be no doubt but steam factories must increase in or near our coal regions, and ultimately these will become the great seats of American manufactures; just as the coal regions of England have become the centers of manufactures in that country. And as we have the largest coal fields in the world, and these scarcely touched yet by the tool of the miner, it makes us hold our breath to contemplate the vast manufacturing power—the hundreds of Sheffields, Birminghams, Manchesters, Leeds, and Glasgows—that will yet arise in our country and make it (on account of its cheap fuel) the greatest manufacturing nation on the globe.

To the Public.

There are a number of slothful, inefficient, inexperienced persons, calling themselves patent agents, in different parts of the country, who manage to make a scanty living by circulating falsehoods in respect to us, and our mode of conducting patent business. They tell people that the Scientific American folks do so large a business and are so overrun with clients that they cannot give to each one, that attention or promptness that his case requires.

This is a very plausible and specious story, but we denounce it as untrue, and those who circulate it as falsifiers. Just the reverse is the truth. No Patent Agency in the country possesses better or more abundant facilities for the preparation of patent papers and no other individuals engaged in the business, bestow more professional care or attention upon their clients and cases than ourselves. Each particular subject receives the most careful study and deliberation, and when complete is promptly despatched. In proof of this we point with pride to the extraordinary success which attends our exertions. If we were negligent, inattentive, dishonest, or in any manner slighted the interests committed to our care, we should long since have ceased to possess the confidence of the community, instead of standing, as we now do, at the head of the Patent Agency business in this country.

Envious and deceiving persons may carp and rail at us to their heart's content, but they cannot alter the fact that the Scientific American Patent Agency is, by far, *the best, the most prompt, the most successful, and the most moderate in its charges* of any in the country.

The Woodworth Patent.

This odious monopoly expires by its own limitation, on the 27th of Denember next. Congress meets December 1st. The monopolists, we understand, are secretly but actively at work, endeavoring to organize a new combination to press a bill through Congress for another extension of the patent. They hope to have the bill passed between the 1st and 27th of December, for after that date their game will be up. We shall oppose the schemers, as heretofore, and expect to be able to head them off. But we request that all who are opposed to the monopoly will second our efforts, by calling upon Members of Congress, now that they are at home, explain the case, and put them upon their guard.

Recent American Patents.

We omit our usual reports under this head, and give place to extended notices of the varieties at the great Exhibition of the American Institute at the Crystal Palace.

Great Exhibition of the American Institute at the Crystal Palace, New York.

FOURTH WEEK.

We have to report still further additions to the stock of contributions on exhibition, consisting of new machinery, engines, &c. The number of visitors has greatly increased. The evening attendance, especially during the three last days of the week was very great. On these occasions the spacious building was, at times, so crowded as to be uncomfortable.

Steam Fire Engines.

Lee and Larnard's engine, of this city, has been placed on exhibition since our last. We are informed that a trial between this machine and that of Silsbie, Mynderse & Co., noticed last week, will shortly take place.

Boiler Incrustation Preventer.

E. W. Sargent, 17 Broadway, N. Y., Stewart Kerr, Agent, exhibits Weissenborn's Patent Boiler Incrustation Preventer. This consists of an apparatus of cylindric shape, somewhat like a stove, through which the water passes previous to entering the boiler. While passing through the apparatus the water is subjected to mechanical filtration, and also to chemical action, heat, agitation, and friction being combined, whereby a perfect separation of the incrusting salts and foreign particles is effected, and the liquid perfectly purified. This invention is in use in several parts of the country, and is said to work with entire success. It prevents incrustation in boilers, no matter how highly impregnated the water is with lime or other substances. The salts are deposited in the purifying vessel, and the boiler kept completely clean. Many specimens of the salts and other impurities deposited in the apparatus are shown at the Palace. For engraving and full description see Scientific American, Vol. XI, No. 15.

Post Boring Machine.

Mr. James Bell, of Birmingham, Pa., exhibits one of I. W. Ward's patent machines for boring slots in fence posts, to receive the ends of the fence rails. Two augers are employed, which are rotated by a crank. The construction of the machine is such that slots of varying lengths may be bored, at pleasure, while the work is done with nicety and expedition. This machine is chiefly intended for use in putting up common farm post and rail fences. It is simple, easily managed, weighs but little, and is strong and durable. Price $16 and up. The exhibitor furnishes visitors with a handbill containing a poetic description of the machine, which is quite amusing. For engraving and description see Scientific American, Vol. XI, page 280.

Rope Machines.

Mr. Thomas G. Boone, of Brooklyn, N. Y., exhibits in operation his new machine, for which he obtained Letters Patent July 15th, 1856. It operates admirably. The construction is quite different from other rope machines. Neither the spools that contain the strands, the capstands, or circler revolve in the direction of the twist. A good and even fore-hard is put in with the lay. The machine does about twice as much work as usual, occupies only about one half the ordinary space, requires only half as much power, is simple, more easily managed, etc. Price $400 and up, according to size.

Mr. Wm. R. Dutcher, of Troy, N. Y., exhibits one of his newly patented rope machines in operation. The improvements are of such a nature as to increase the rapidity with which the rope is made, improve its quality, lessen the number of attendants, power required, &c.

Drop Press.

Milo Peck, of New Haven, Conn., exhibits in operation one of his patent Drop Presses, for stamping sheet metal. It is a strong and effective machine. The main shaft has a constant rotary motion, and lifts the weight.—There is a spring at the top, which holds the weight when it comes up, and prevents it from falling, although the shaft continues to rotate. The weight is discharged by a cord or pedal, which the attendant touches for that purpose. The machine on exhibition works well, and appears to be under perfect control of the operator. For an engraving and full description see Scientific American, Vol. XI, No. 18.

Parallel Vise.

Mr. Wm. H. Schofield, Agent, of Yellow Springs, Green Co., O., exhibits Davis' patent Parallel Vise, which appears to be a first rate implement. The long screw is dispensed with, the jaws always move on a parallel line, it is opened and closed in a much briefer space of time than the common vise, is cheap, simple, and durable. For engraving and full description see Scientific American, Vol. XI, No. 16.

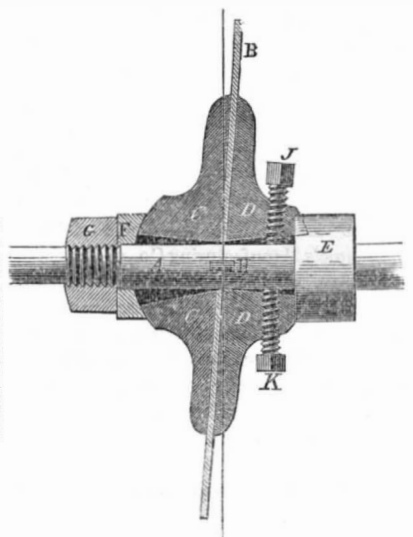
Lathe Chuck.

Messrs. E. Horton & Son, of Windsor Locks, Conn., exhibit samples of their lathe chucks for centering. The jaws are moved in and out from the center by screws, and the latter are furnished with pinions, which gear with a cogged ring, so that when one screw is turned by hand, all the jaws will move. The chuck box or shell is composed of two parts, and when required may be taken apart, and the cogged ring removed. Each jaw may then be moved independently. Price $20 for chucks of 6 inches diameter, and upwards, according to size.

Portable Saw Mills and Sawing Machines.

Pinney Youngs & Co., Milwaukie, Wis., exhibit, in operation, one of their portable saw mills. It attracts great attention. The saw employed is a circular one, and the arrangement is such that it cuts both forward and back. The setting of the log, after each cut, is done by mechanism, so that the machine is self-acting in nearly all respects. We are told that logs can be placed upon the carriage, and rapidly cut up into boards without labor on the part of the attendant, except to carry away the lumber. It is said that these machines will cut from 2000 to 2,300 feet of siding per hour. This is great speed. The machine is simple, easily taken apart and set up, occupies little space. Price $1000 and upwards, according to size.

Channeling Saw.—Mr. George Hutton, of Morrisania, Westchester Co., N. Y., exhibits in operation a circular saw arranged for cutting grooves of varying widths and depths, and for other purposes. The novelty consists in a peculiar arrangement for changing the relative angle between the saw and its arbor.



In our engraving A is the arbor, B the saw. The vertical line shows the deviation of the saw from the ordinary position, at right angles with the arbor. C D are two collars which clamp the saw. Each collar is flat on the face touching the saw, and spherical on its other face. These collars may, when desired, be removed from the arbor There is immovably fixed on the arbor an additional collar, E, one face of which is concave, so as to fit perfectly to the corresponding spherical or convex face of D. A washer, F, similarly concave, is slipped loosely on the shaft, A, so as to fit in the same manner against the convex face of the collar, C. A nut, G, screwed on A, presses against the plane face of F, and by the aid of this nut all the parts may be released or firmly secured, at pleasure. The movable collars, C and D, must have considerable thickness, so that the convex faces thereof will be portions of large and not of small spheres, and also that the center of such sphere must coincide with the center of the saw. The shaft, A, is of such size as very nearly to fill the circular orifices on the plane faces, and also to fill the orifices in one direction on the convex faces, but in the other direction the oblong shape of the last named orifices allows considerable play.

When the collars, C and D, are placed together, the nut, G, being slackened to allow motion of the parts, the saw may be siezed by the hand and readily placed square with the spindle, or as readily inclined over in one direction, but it cannot, by any force, be inclined in any other direction, by reason of the peculiar form of the cavities described. This device allows also of adjusting the obliquity of the saw by percussion, which is, in some accounts a superior agency for this purpose. In order to adjust the saw it is necessary to slacken the nut, G, but yet allow it to press so as to confine the parts with moderate force and strike with a mallet against either of the movable collars, C or D. By this means the amount of obliquity desired may be obtained with accuracy, after which the nut, G, must be screwed very tightly to its place. When thus screwed up, the pressure against the parts is sufficient to prevent any change, until the nut is again slackened. When it is de-

sired to set the saw square with the shaft it is only necessary to drive its edge in one direction until it can go no further, by reason of the hole bearing fair along the shaft.

In order to compel the movable collars, C and D, to maintain a proper position relatively each to the other, a projection, H, is made on the shaft, A, and corresponding notches or grooves cut in both the movable collars, also in the saw.

To facilitate a nice adjustment of the parts without percussion, screws J and K are used, tapped through D, and pressing with their smooth rounded ends upon the shaft, A. To adjust the saw by these means the nut, G, is slackened, and one of the last-named screws withdrawn, and the other advanced, until the motion thus produced brings the saw to the plane desired, after which the nut, G, is tightened, as before. When adjusting the saw by percussion, as first described, both the screws, J and K, must first be slackened.

This invention is one of a very useful and practical character. It may be employed for grooving of various widths and depths, the depth of the grooves being altered by changing the hight of the table, which is done by a screw. The saw may also be employed for rabbiting, cutting double tenons, squaring, cross grooving, and a variety of other uses that will readily suggest themselves to the operator. At whatever angle the saw is placed it is perfectly balanced. For further information address the inventor, as above.

Tree Sawing Machine.—The Farmer's and Mechanic's Manufacturing Co., of Green Point, Brooklyn, N. Y., exhibit some of Ingersoll's Tree Cutting Machines. These are small apparatuses, light, and portable, but very effective. Two men can cut trees or logs of 16 inches diameter in two minutes. It is alleged that this machine effects a great saving of time over hand labor in tree cutting. It is readily applied. Price $75. For an engraving and full description see SCIENTIFIC AMERICAN, Sept. 27, 1856.

Hazard Knowles, 413 Broadway, N. Y., exhibits specimens of his patent saws, the novelty being in the peculiar formation of the teeth. Each tooth acts independently, and cuts its own shaving, as if it were a separate plane. The result is that a great saving of labor is effected, the stuff being cut, instead of rasped or broken away, as by the common saw teeth. The hand-saws shown by Mr. Knowles, appear to possess an important advantage over the ordinary kind. They work easier, cut straighter, etc. A mortising blade, with teeth formed in the same improved manner, also operates well. Saw mills requiring only 6-horse power are made, which, it is alleged, will cut 1000 feet of inch boards per hour.

Burglar Alarm.

Mr. Wm. McLachlan, of No. 76 Hammond street, N. Y., exhibits a curious little contrivance for sounding an alarm whenever a burglar attempts to enter the door of a sleeping apartment. It consists of a small gong-shaped bell, having a spring and wheels within its concavity. This contrivance is hung upon the door key, which is left in the lock, on the inside of the apartment. When the burglar inserts his nippers from without, and partially turns the key, the bell instantly begins to ring, and gives a thorough alarm. Price $5.

Boot Crimp.

Messrs. Fetter & Co., of Philadelphia, Pa., exhibit one of their patent Boot Crimping machines. It is quite a novelty. The crimp board is divided at the instep, and the two parts are hinged together. Each portion is moved by its own set screw. There are movable nippers which hold the shank corners of the leather. The nippers are moved by a set screw. After the leather has been stretched upon the crimp board, it is gradually screwed up into the proper form, and the crimping is thus done in the most perfect manner. The work of a man, laboring hard for an hour and a half, may be done by a child, in two minutes, by the use of this machine. Boot makers may gather from this some idea of its utility and value. The work done is superior to that executed by hand. It is applicable to all kinds of leather, fine or stiff. The instrument is attached to a small stand, and is so jointed as to be easily manipulated. Price $11. For engraving and full description, see SCIENTIFIC AMERICAN, Vol. 11, page 289.

Improved Crane.

Mr. B. J. Burnett, of this city, exhibits a large model of his improved Crane, for lifting heavy weights, such as steam boilers, machinery, cargoes, etc. The improvement consists of a frame tower, from which arms or beams project at whose extremities the weight is lifted. The lifting rope or chain runs up through the tower and out to the extremities of the arms. One prominent merit in this invention is, that it is an independent crane. It requires no connection or bracing from surrounding objects, involves no waste or other device that becomes dangerous if any strap or small portion gives way. It appears to be a valuable substitute for common cranes and derricks. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. 11, page 321.

Pipe Coupling, Without Solder.

Messrs. Fetter & Co., of Holmesburg, Pa., exhibit specimens of pipes, coupled together with water-tight joints, without the use of solder. Our engraving illustrates the invention.

Fig. 1

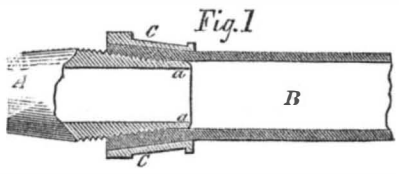


Fig. 2

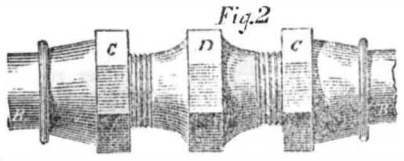


Fig. 1 shows the method of coupling a lead pipe and faucet together, A being the faucet and B the pipe. The extremity of the faucet is beveled, and has a screw cut upon it. C is a conical ferrule, into which the end of the pipe is introduced. The conical extremity of the faucet, A, is now screwed into the pipe, the mouth of which is thus expanded and firmly pressed between ferrule C, and faucet A, as shown. The joint thus made will be perfectly tight and substantial. The tip end of the faucet, at *a*, is left smooth, without screw thread. This smooth surface prevents burring up of the pipe.

Fig. 2 shows the mode of connecting different lengths of pipes. B are the pipes; C, conical ferrules; D conical connecting tube, with screw thread upon its ends, like the faucet A in fig. 1. The junction is made in the same manner as above. On the inside of the ferrules, C, there are projections which strike into the periphery of the pipe, and prevent the ferrule and pipe from turning and slipping. The outside of the ferrules are made in octagonal form, so as to be easily held by a wrench during the coupling operation. Previous to inserting the screw, a wooden plug is driven into the mouth of the pipe, in order to expand and bind it and the ferrule together.

This is a very rapid, cheap, and convenient method of coupling pipes. Its advantages over the solder joint will be obvious. It requires no fire or heat. Any person may use the improvement. Pipes may be coupled under water, or in situations where solder cannot be used, etc. Address the exhibitors as above for further information Patented Aug. 19, 1856.

Tree Cutting Machine.

Mr. S. Strauss, of No. 212 Broadway, N. Y., exhibits one of Ehrsam's patent machines for cutting down forest trees. It consists of an iron ring, hinged in its center, so that it may be opened and then brought together again around a tree. It is, in fact, a girdle. The ring carries a cogged rack, which is caused to revolve around the tree by means of a crank and pinion. The rack carries a cutter which revolves round and round the tree cutting inward as it goes. This is a very compact, portable tree cutter, and works well. It is shown at the Palace in operation, an upright log being substituted for a tree. Price $35. For an engraving and full description see SCIENTIFIC AMERICAN, Vol. 12, page 1.

Hand Corn Planter.

Fenwick & Boeklen, 77 Poplar st., Brooklyn, N. Y., exhibit a convenient little implement, plain and unpretending in appearance externally, but possessing several really useful virtues. It accurately measures the corn for each hill, and plants and covers it perfectly by the simple operation of forcing its end into the ground and lifting it out again. Covering the corn perfectly is a step in advance, and commends this implement to the farmer in preference to those machines which simply plant seed and leave it uncovered. This implement will be found illustrated in No. 44, Vol. XI., SCIENTIFIC AMERICAN.

Mechanic's Institute Polytechnic Schools.

It has afforded us much pleasure to witness the progressive spirit which has characterized the New York Mechanic's Institute during the past few years, and especially the recent efforts made by its officers and members to carry out the original objects of its charter, by making it a good Educational Institution. To carry out this object, a Polytechnic School on a large scale has just been organized, and placed under the control of Prof. B. Garvey. Mathematics, languages, music, philosophy, engineering, and all the branches of a good education will be taught. A large gymnasium for healthful physical exercises is to be connected with the school—an essential feature—and popular lectures on various subjects will be given. It is also intended to have primary and graduating classes, up to a very advanced stage of instruction. Ladies and gentlemen's classes will be taught, and the instruction will be such as to fit both sexes for a cultivated useful life.

We think well of the objects of the Institute, with the exception of having a primary department, this should be omitted from its programme of instruction. The city Primary Schools are sufficient for instructing children up to a certain limited point, but beyond that more high schools are now required for our city youth. The Institute should rather devote its entire educational energies to found a superior High Polytechnic School, and no other. Such a school is certainly much wanted in this city, and we hope that of the Mechanic's Institute will completely supply the want. The spacious new buildings, 18 and 20 Fourth Avenue are now occupied by the Institute.

Macadamized versus Plank Roads.

We understand that most of the plank roads which were laid down a few years since in various parts of our country, have proved failures; they did not pay expenses. This is not the case with them all, but the majority of them, and some of these in regions where lumber is comparatively cheap. The planks being laid flat on the ground, rot out so rapidly that the expense for repairs amounts to about 30 per cent. of the original cost annually. This is a very large amount for wear and tear, and we do not wonder that many of them should have failed to pay expenses.

In the neighborhood of New York on Long Island, the plank roads laid down four years ago are now being torn up and superseded by good Macadamized roads, and it would be well for the road masters of nearly every town in our country to follow the example. Our common roads are very defective; they do not reflect much credit on our farmers who make them and keep them in repair. They seem to act as if the time they spent in working on their roads was an infliction, hence they shirk the labor, or execute it so slovenly as to merit reproof for want of good sense. If the ruts are annually filled up with mud, so as to make a smooth surface in dry weather, they think they have done their duty; but mud roads never can be made into good roads; they will always be rutty, and dotted over with sloughs of despond in wet weather. Good roads are civilizers, by promoting travel; and they are economisers, by making travel easier for man and beast. They are avenues of commerce, and as a team can draw twice the amount of load on a good road that it can on a bad one, and travel twice as fast, surely it would be wise for our farmers in every part of our country to labor hard and incur considerable expense to establish a system of good solid permanent common roads. The making of macadamized roads costs considerable at first, but the cost is principally for labor, not materials, where gravel or stone can be obtained; hence every farmer can do his share in making them without paying money directly out of his pocket. They are also simple of construction, and require no great engineering skill to execute, and when once well made they do not cost much for repairs. We therefore hope that our farmers will give this subject their careful attention, and act upon the suggestions.

Furs.

The *Journal of Commerce* states that on particular inquiry the fur trade in this city will reach $1,375,000 this year. The price of American furs has lately risen considerably. Mink, which formerly commanded from 30 to 50 cents, is readily bought up by our furriers at $3·50 to $4; ordinary Western, which was worth 25 or 30 cents, now brings $2·50; other furs, too, are much higher.

The *Journal* says:—"We lately saw a box of Russian sable, not more than three feet long, of camphor wood, which contained 400 small skins bearing the seal of the Russian Government, valued at fourteen thousand dollars. Some of the skins cost $52 each. A lower grade of inferior color are worth $28, and some not more than $16. These are commonly sold at a profit of 30 or 33 per cent.—Sixteen or eighteen skins are required to make a full-sized cape, so that the cost of a choice quality garment of this description would be about nine hundred dollars. Adding the cost of making and the profit, such an article could not be procured for much less than fourteen hundred dollars. Hudson's Bay sable cost this year about $25 per skin."

It may be mentioned that our large furriers employ no other means to preserve their goods from insects, except beating and airing them every three or four weeks.

Gold from Marrow Bones.

"In Australia Mr. Mooney has been delivering a lecture on the origin of gold, concerning which he propounded the following novel theory: He set out by declaring his belief that gold is the petrified remains of matter which was once animate; and accompanied as it generally is by ocean pebbles, quartz, crystal, and other saline and marine debris, he was of opinion that gold is the petrified fat or marrow of a peculiar fish, which once floated over the gold fields when those fields were beds and bottoms of the world's great ocean. In proof of the hypothesis that gold is nothing more than the petrified fat of a peculiar fish, the lecturer showed specimens of quartz in which marine shells were embedded. Mr. Mooney also alluded to the fact that iron exists in the human blood, and argued from that position that gold might be educed from the marrow of fishes."—*Albany Knickerbocker.*

We wonder if this is the Mr. Mooney who once delivered lectures on various curious subjects in this city about sixteen years ago. He was a native of the Emerald Isle, a droll fellow, and always discoursed on some strange topic.

To Destroy Crickets.

A correspondent of the London *Cottage Gardener* says he has destroyed hundreds of crickets by means of a common white glazed jar, about nine or ten inches high, put in the place they infest, with a slice or two of cucumber in it, and one live cricket as a decoy. They will hop *in*, and strange to say, have not the power to hop *out*. It is not well to destroy them daily. When the jar is one-third full of crickets have it filled with boiling water.—This is a simple and effectual method of getting rid of these insects.

English Pottery

Staffordshire, in England, is the great seat of the porcelain and pottery manufactories. No less than 60,000 persons are employed in the works, and the annual value of the porcelain manufactured amounts to about $10,000,000 per annum—three-fourths of which are exported.

W. N. H., of Texas.—A fly wheel does not enable machinery to be driven with less power; it merely regulates the power, and is also called a balance wheel.

F. G. R., of Va.—We published elaborate articles in our last Volume, on kyanizing timber. The cheapest way to kyanize your boards, is to steep them in a solution of sulphate of copper, for three days. Use one pound to one hundred gallons of water. You can steep them in a tank made of boards; place stones upon the boards to sink them under the water: dry them after they are steeped.

E. A. C., of Conn.—There is no time fixed by law when an applicant must withdraw his case in order to get twenty dollars refunded

W. R. P., of Va.—The in ormation you solicit on Smut Mills we cannot give. Address J. D. Bidwell, Uhrichsville, Ohio, J. R. Gates, Eickmansville, Ohio, George Heberling, Quency, Ill., or G. H. Starbuck & Co., Troy, N. Y. Either of the above parties can give you the desired information.

J. E., of Pa.—We have examined your diagram, and description of two combined wheels, with syphon conductors, but our former opinion is unaltered. Two wheels on one shaft, the water passin through one of them into and out of the other, have been tried, and are not new; but we are not aware of syphons having been employed with the same combination of wheels you have designed. Send along your model, and we will examine it.

J. R. E. S., of Phila.—We are not acquainted wit h any work describing the latest improved processes of manufacturing whiskey.

J. F. R., Pa.—There has been no epidemic yellow fever whatever, in New-York or its vicinity, this season. If the insect theory is correct it has not been corroborated by the clouds of flies which were seen coming north. The disease at Staten Island was introduced by vessels from the West India islands, and every case that occurred has been distinctly traced to contagion.

J. G., of N. J.—We cannot furnish you with one of the Sewing Machines referred to. Address the Patentee. Gold in an acid solution, can be precipitated with common salt, and then reduced to a solid by severe pressure or smelting By driving off the acid by heat, the gold can also be solidified by pressure. The only way to prevent the evaporation of a glass solution is to seal it up tight, or keep it at a low temperature in an ice-house.

C. Y. H., of Va.—We understand your ideas perfectly respecting employing the irregular power of wind by a mill, to compress air in a strong vessel, and take the power from it to drive an engine regularly. This plan has been proposed a number of times, but the great difficulty in carrying it out is to keep up a regular pressure in the air reservoir, which is absolutely necessary.

S. W. B., of Mass.—If the water in your cistern which is placed above the boiler exerts a pressure on its base qual to t e pressure of the steam in the pipe under it, t en the two should balance each other exactly, but if the pressure is unequal, the steam, if greatest, will rush up into the cistern, and become condensed; its pressure be lowered, and the water will descend to the boiler.

C. A. B,. of N. H.—If you keep polished steel perfectly dry, it will not rust, but if you cannot do this you must coat it with a varnish. Use copal varnish for this purpose.

W. C. T., of Ill.—Babetting metal, means to enclose a soft metal bearing in an iron shell, such as an alloy of copper, tin, and lead, or brass.

E. E. B., of Ga.—If you boil your cloth for awnings in a weak solution of sulphate of copper, for one hour, then dry it, mildew will not readily form on it. One pound of sulphate of copper is sufficient for 100 square yards. Write to Wells & Webb, Printers' furnishers, this city, about your type.

W. F. V., of N. Y.—You can use bleached cotton or linen cloth for window shades. They are prepared by brushing them over with the best quality of painters' varnish.

John Mahoney, of Detroit, Mich., wants the best and cheapest machine known for cutting shavings for mattresses. Who can furnish him?

E. B., of Mass.—For further information respecting the sewing machine address the party named in the paper.

J. M. C. Reed, of Girard, Ala., wishes to procure a machine for sawing wood or shingle blocks, the machine to be portable, carried to the wood, and not the wood carried or applied to the machine.

H. J. F., of Ohio.—Glazing is effected by a mixture of oxyd of lead and ground flint. These materials are first ground to an extremely fine powder, and mixed with water to form a thin liquid. The ware is dipped into this fluid, and withdrawn. The moisture is soon absorbed by the clay, leaving the glazing particles on the surface.—These are afterwards melted by the heat of the kiln, and thus constitute a uniform and durable vitreous coating.

S. J., of N. Y.—The process of making starch is very simple. Potatoes, for example, from which most of the starch of commerce is manufactured, after being pared, are grated to a pulp. This pulp is put upon a seive and stirred about, while at the same time a small stream of water is made to flow upon it. A milky liquid flows through the seive, but the fibrous portion of the potatoe, the vegetable tissue, remains behind. This liquid, after a short interval, deposits a white powder, which is starch. Starch can be obtained from a great variety of plants.

W. H., of Mass.—Your diagram and card do not prove that the moon has a rotation on its own axis, but that it revolves round and with the earth—the earth being the axis.

D. R., of Mich.—We do not think a patent could be procured on the modification you propose in window blind slats. It would not be considered sufficiently novel to justify an application for a patent.

J. M. T., of Ind.—The coffin level is not of sufficient interest to engrave. The curved lever for the horse power would have a trifling advantage. $1 for paper received.

S. S., of Mass.—The old English law regulating the time hides of various kinds shall be tanned, has, we believe, become obsolete. It is possible that such a law may still be on the statute books, but we think it is never regarded. The introducer of an invention in England may obtain a valid patent, irrespective of the consent of the inventor.

J. P. H., of Texas—You can procure hydraulic rams o W. & B. Douglass, Middletown, Conn.

☞Money received at the SCIENTIFIC AMERICAN Office, on account of Patent Office business for the week ending Saturday, Oct. 11, 1856:—

B. & C., of N. H., $30; A. B., of N. Y., $55; T. & C., of Mass., $25; L. & W., of Mo., $275; G. O., of N. Y., $25 H. P. T., of Mass., $30; J. C. B., of Conn., $10; W. C., of Ala., $25; J. F. N., of N. C., $30; W. P. F., of La., $55; S. Z. H., of Texas, $10; J. D. S., of O., $25; S. S. M., of S. C., $25; J. A. T., of Pa., $30; J. F. P., of N. Y., $30; G. S., of Mass., $30; J. W. C., of N. Y., $30: O. R. M., of N. Y., $25; G. H. S., of Wis., $25, J. J. W., of N. J., $30; M. L., of N. Y., $25; O. V. D. R., of Ill., $25; G. S. of Ill., $30: J. L., of O., $25; H. G., of C. W., $30; W. H. McN., of N. Y., $30; C. & G. M. N., of N. Y., $25; W. J. D., of N. Y., $25; G. D. L., 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, Oct. 11th:—

G. O., of N. Y.; C. & G. M. W., of N. Y.; J. F. W., of N. Y.; W. J. D., of N. Y.; T. & C., of Mass.: G. D. L., of N. Y.; E. L. E., of R. I.; G. H. S., of Wis.; W. C., of Ala.; O. R. M., of N. Y.; N. H. McN., of N. Y.; C. C., of Va.; A. G., of Mass.; R. O. J., of N. J.; H. H., of Miss.; R. E., of Pa.

Important Items.

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.

A WORD OF WARNING.—To those who have procrastinated in renewing their subscriptions, but still design to remit in a few days, we would say, be careful and not delay too long. The back numbers of the present volume are running low, and some of our friends are going to be disappointed, by and by, when they send in their subscriptions, and order the back numbers, by a short reply back, "Back numbers all gone."

MODELS.—Inventors, in constructing their models, should bear in mind that they must not exceed a foot in measurement in either direction. They will also remember that the law requires that all models shall be neatly and substantially made of durable material. If made of soft wood they should be painted or stained. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and prevent the liability of their being mislaid.

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 a this office upon application by mail.

RECEIPTS—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a bona fide acknowledgment of the receipt of their funds.

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

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.

Literary Notices.

LIFE OF GEORGE WASHINGTON—By Washington Irving.—Vol. 3 of this superb work, duodecimo edition. has just come from the press of G. P. Putnam & Co., N. Y. It is embellished with a likeness of Gen. Putnam. "The Life and Character of George Washington," in the hands of such a literary artist as Irving, rise in their grandest proportions, and cannot fail to impress themselves upon the American mind with increased power and attractions. We wish every family in our land would procure this work. It needs to be known and read far and wide, and its influence will be peaceful and salutary. We advise our readers to get this, the best "Life of Washington" extant. It is not only a narration of all the interesting events of his own career, but becomes necessarily a History of the American Revolution.

THE BIBLIOTHECA SACRA.—The number of this able theological review for Oct., contains articles on Dr. Lepsius's Universal linguistic alphabet; "Authority and Obligation of the Sabbath;" "The Bible in School;" "An Account of Bashan Iturea, and Kenath," by Rev. J. L. Porter, Missionary at Damascus; "A Review of Toplady's Works," and a long criticism on the "Mosaic Narrative of Creation," by Prof. Barrows, of Andover. This is an able Essay, partly in reply to Prof. Lewis, of Schenectady. The previous number of this Review was not received by us. Published by Warren F. Draper, Andover, Mass.

MUSPRATT'S CHEMISTRY.—The 11th and 12th numbers of this beautiful and thorough work, have just been issued by C. B. Russell & Bros., Tremont-st., Boston. The 11th contains a fine Steel Plate Portrait of Prof. Brande; the articles treated are "Bone Black" and Bleaching. When completed, this will be the most complete single work on Chemistry yet published. The price is 50 cents per No.

THE UNITED STATES MAGAZINE for October contains an illustrated article of interest on the Patent Office at Washington, besides other articles spicy and interesting. J. M. Emerson & Co., Publishers, New York.

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.

Pictures on the Retina of the Eye of a Deceased Person.

It was recently asserted, by an English surgeon, that the last scene viewed by a murdered man would remain impressed upon the *retina* of the eye, as does the impression upon the daguerreotype or the photograph. To test this assertion, the Auburn, N. Y., *Advertiser*, states that Dr. C. P. Sanford, of that place, examined the eye of J. H. Beadle, who was murdered in Auburn. The editor says:

"We were present, during the examination, and have, at least, this testimony to bear: that there is truth in the principle involved. Dr. S. made a skillful dissection of the eye, and succeeded in bringing the *retina*, one of the most delicate of human organs, being an expansion of the optic nerve, under the view of a microscope. There was nothing on the retina examined which would lead to the detection of the victim's murderer, but there was that impressed upon it which sufficiently establishes the fact that the retina retains the last impression made upon it. What we saw ourself, we do not feel disposed to make an affidavit of, and therefore prefer not to state; but we will say that an examination of the retina of an eye with a common microscope, reveals a most wonderful as well as a beautiful sight and that in this instance we discovered, as upon a daguerreotype plate, plainly marked impressions at once interesting and startling to behold. We put these facts on record with a view to arouse an interest in the subject that future experiments may be made, and the cause of science advanced."

[We wish the editor had been a little more explicit. We do not believe that any such effect is produced upon the retina of a deceased person's eye as that described. It is stated that the picture is produced like that on a daguerreotype plate; now, how can this be the case, when such pictures are the result of chemical action, whereas, the pictures produced on the retina are simply like those produced on a looking glass.

Substitute for Hops.—Nitric Acid Compounds.

A. Behler and F. Quartin have secured a patent in England for a composition called "Lupulied," to be used as a substitute for hops in brewing. It is manufactured by adding two parts by weight of nitric acid to one part of some resinous substance, such as pitch, broken into small pieces, and heating the mixture over a slow fire until it begins to distil, into gaseous bubbles, when they move it from the fire and allow it to bubble over into a receiver. The heating is repeated, until the acid ceases to work the resin and throws it over. After cooling the product is washed to remove all traces of acid; it is then dried, and is fit for use as a substitute for hops. This substance is the distilled product of nitric acid and resin.

The wonderful chemical results produced within the past few years with nitric acid and hydro-carbons, such as oils and resins, has excited astonishment. Nitric acid and a little alcohol mixed with the most fœtid oils, and then distilled, changes them into agreeable perfumed oils.

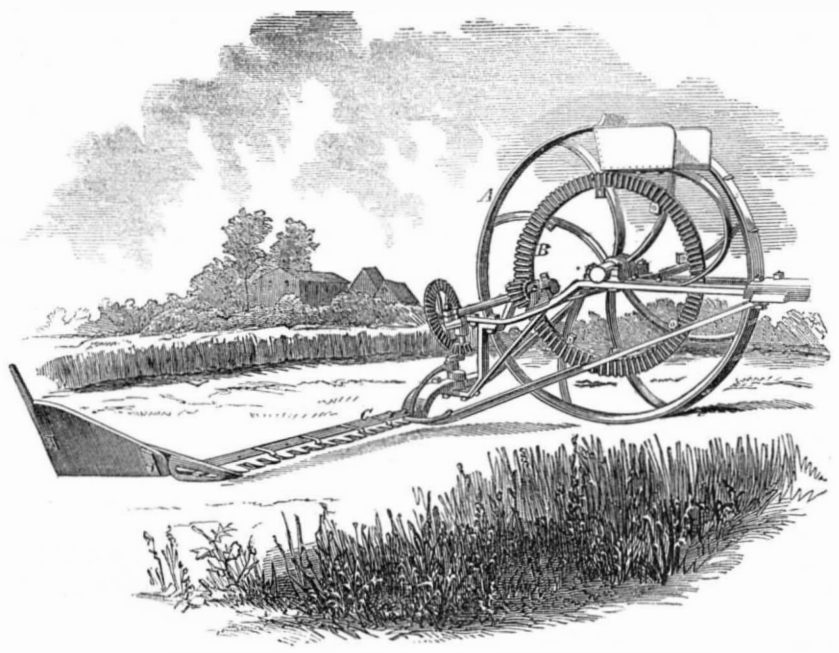
Artificial tannin can be manufactured from nitric acid, charcoal and water. Take 1 part of charcoal by weight, 5 of nitric acid—of specific gravity 1·40—and 10 of water. Mix the charcoal with the water in a flask, then pour in a part of the nitric acid, and heat up until lively effervesence and the escape of nitrous fumes ensue. In about two days the remainder of the acid is poured in, until the entire charcoal is digested. The liquor that is thus produced is of a dark brown color, and clear. The water is now driven off by evaporation, and the result is a brown mass, having a slight excess of acid. It is then washed several times, to remove the acid, after which it is evaporated to dryness by a gentle heat, and forms an artificial tannin product. M. Hatchett discovered this tannin, and he remarks that all kinds of carbon will yield it by the action of nitric acid. Resins treated in the same manner will also produce artificial tannin.

Syrup from the Chinese Sugar Millet.

The Calhoun (Ga.) *Statesman* states that Mr. J. Peters, of that place, has made about 320 gallons of good syrup this season from the juice of the Chinese sugar millet. Sixteen stalks yield a gallon of juice, and five gallons one of thick syrup, by evaporation. The stalks are simply run through between a pair of heavy rollers, the juice received into tubs, and then boiled down into syrup or molasses. In Georgia, the *Statesman* asserts that with proper cultivation 400 gallons may be obtained from an acre of millet.

The Boston (Mass.) *Traveler* states that J. F. C. Hyde, of Newton Center, has cultivated some of this millet this season, and has made a quantity of excellent molasses from it. It is stated that it can be cultivated as successfully as Indian corn in Massachusetts, and that both syrup and sugar can be obtained from it. This is a question which should arrest the attention of our farmers. Not one or two experiments, but a great number are required to decide whether or not this plant can be cultivated with economy, for the purpose of extracting syrup or sugar from it. The warm regions of our globe now furnish our saccharine matter; it yet remains to be proved whether colder climates can furnish a cheap supply.

NEW MOWING MACHINE.

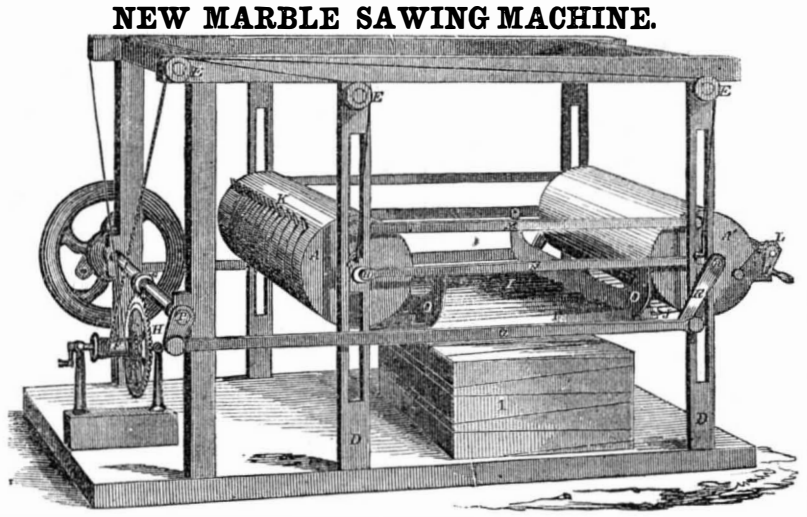


The accompanying engraving illustrates an improvement in Mowing Machines, for which letters patent were granted to Mr. Henry F. Mann, of Westville, Ind., June 2d, 1856.

The principal novelty consists in a peculiar arrangement and construction of the frame, which permits the employment of a very large driving wheel, causes the machine to run easy, diminishes the weight, and lessens the cost of construction. The driving wheel, A, large gear wheel, B, and pinions, are of cast-iron, but all the other parts are of wrought-iron, put together in the manner shown in our cut. The tongue is so placed as almost to do away with side draft. The cutter bar, C, is made in the usual manner, and smooth cutting edges employed. But any other kind of cutting device may be used if desired. The gearing is arranged in a firm and compact manner, and there is little or no trembling when at work. A four feet driving wheel is used.

This invention has been thoroughly tested in competition with others of the best reputation, and is said to be superior in several important particulars. It requires less power to drawn it, is more easily handled, weighs considerably less, is not likely to get out of order, is extremely simple, durable, etc. For further information address the inventor, as above.

NEW MARBLE SAWING MACHINE.



New Marble Saw.

The machine illustrated by our engraving, invented by Josiah Ashenfelder, of Philadelphia, and patented June 3, 1856, is principally intended for sawing up blocks of marble into angular shapes, such as monuments, but it may be used with equal advantage in sawing slabs. The method of adjusting and changing the angle at which the saws cut, is both simple and accurate.

The drums A A′, with their shafts, B B, rest in the flanged boxes, C, to allow them to rise and fall freely in the slotted guides, D. The drums and connections to be raised and lowered by means of the chains or cords by which they are suspended—being fastened to boxes C, and passed around the grooved pulleys E, and wound on the drum F, which is operated by the thread G, on the driving shaft gearing into the toothed wheel H, which is secured by a catch and spring to drum F.

The saws I, are hung on chains I, which are fastened on pins K, arranged at convenient distances on drum A, and to drum A′, by being wound on the small shaft L, placed near the top of the drum for the purpose of straining the saws. The rods M, serve to give motion to drum A, and also as a stay against which to strain the saws. The rods N, by keeping the shafts, B B, equi-distant, prevent undue friction on guides D, in straining the saws.

The guide bars, O, are bolted to the rods, N, and are provided with slots through which the saws pass and are guided. The saws are operated from the drums A A′, which receive an oscillating motion in the ordinary manner, from short cranks P, connecting by rods, Q with long cranks, R. To change the angle of the saws it is merely necessary to shift the chains I, on the pins K, and shaft L, to the angle desired, and adjust the saws in the guide bars to suit.

The block of marble in the engraving represents one mode of sawing by which no less than twenty-five monuments can be cut from a block of sufficient size—using six saws, at three cuts, as will appear at C1, representing the first cut, by which five tapering slabs are sawed, requiring two more cuts to perfect them, and with not more than one-eighth the waste of the ordinary machine.

For further information address S. A. J. Salter, Queen street, Kensington, Philadelphia.

Explosion on a Steamboat.

The steamboat Isaac P. Smith exploded its steam-chest, on the 8th inst., near Haverstraw, on the Hudson River, scalding to death two firemen, and severely injuring the engineer. It is stated that it was racing with the Glen Cove when the accident took place. We hope the Inspectors will give this case a thorough examination.

Fattening Ducks.

Ducklings intended for the table should be confined in a warm house, never be allowed to swim, and have an unlimited supply of food. A mixture of three parts of Indian corn meal and one part potatoes, moistened slightly with the washings of dishes, the liquor in which meat has been boiled, or milk, with a few unground grains of barley once daily, fattens them quickly.

The temperature of the valley of Sacramento, (Cal.,) during the day, in summer, ranges from 102° to 120°, in the shade.