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A Tribute to Sir Isaac Newton.

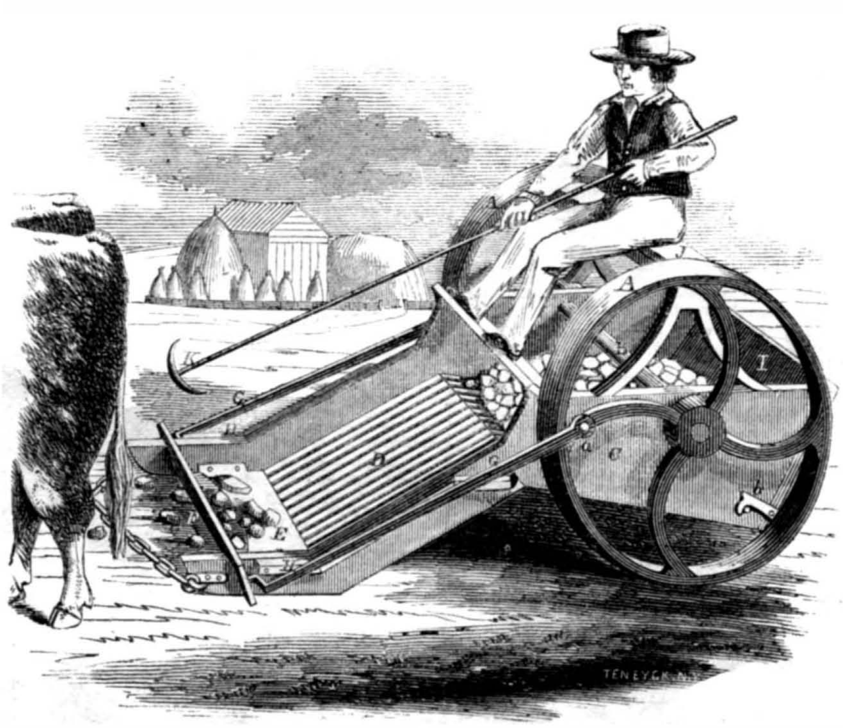
A ceremony of a most extraordinary character took place at Grantham, England, the native place of Sir Isaac Newton, on the 21st ult. This was the erection of a beautiful colossal bronze statue of the great philosopher. Men of the highest attainments in European science, literature and statesmanship were present to do honor to the proceedings, and the venerable Lord Brougham thrilled the immense audience with one of the most eloquent orations delivered since the voice of Demosthenes was hushed at Athens. His subject was the genius of Newton and the progress of physical discovery. In regard to his genius, he said:—"The consent of nations has declared that he is chargeable with nothing like a follower's exaggeration or local partiality who pronounces the name of Newton as the greatest genius ever bestowed by the bounty of Providence for instructing mankind on the frame of the universe, and the laws by which it is governed."

No exception, we believe, will be taken to this panegyric. We place a far higher estimate upon the quality of Newton's intellect than that of Cæsar, Napoleon, or any of the great warriors, whose feats in arms seem to dazzle the mass of mankind.

When Isaac Newton was a boy, he had a strong predilection for mechanics, and was quite "a whittling genius"—great for making wooden clocks, sundials, and all such knick-knacks. He was eighteen years of age before he commenced the study of mathematics, but he very soon attained to the front rank in this science. At twenty-five, he discovered the law of gravitation, and laid the foundation of celestial dynamics, a science which originated in his giant mind. He afterwards become a Professor in Cambridge, Master of the Mint, and lived to a good old age. Throughout his life he was an humble student of nature, always learning something new. After having attained to the highest elevation in science by his discoveries in mathematics, optics and the laws of the universe, he declared he was only like a boy, who had gathered a few pebbles on the shore of a great sea.

Lord Brougham, in his oration, stated that Newton's discoveries were great in degree rather than in kind, and that no science was the work of one mind. There is a law of gradual progress ruling in all the sciences—physical and moral—and developement is the work of many minds. This idea deserves attention, because it is borne out by facts. A science is like a beautiful temple; many minds and many hands are necessarily required to complete the work, and its lofty walls may rest upon very rough foundation stones. There is not a single perfect science; and with all the progress which has been made in discovery and knowledge since Newton was laid in the grave, the greatest living sages must still say with the deceased philosopher, that only a few pebbles have yet been gathered on the shore of the great sea of the universe.

BISHUP'S STONE GATHERER.



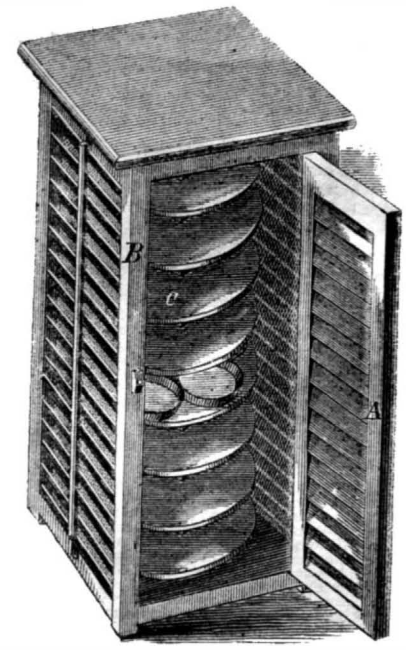
There is many a piece of land which seems only fit to grow weeds and produce stones, that would be useful and arable were the stones cleared, and these latter are one of the greatest nuisances on farms and new land. It costs too much to gather them one by one, and such a machine as our engraving represents will prove a great blessing to all agriculturists who are troubled with a stony farm, and also to roadmakers and others. The machine is fully shown in the accompanying perspective view, and is so simple, but at the same time perfect, that its construction can be seen almost at a glance.

A are two broad wheels connected by and rotating on an axle, B. From B is suspended the box or body, C, so that all the soil which may be brought up with the stones, again can drop upon the land, and not be carried away. A metal plate, E, is secured across the part of the machine which rests upon the ground, and as the whole is drawn along, by oxen or horses, this passes under the stones and lifts them off the ground, and they are then brought up the inclined slats, D, as well as gathered on to E, by the scraper, F, which then forces them to fall into the back part of the device, C. I is a door or movable back suspended from the top, and secured by catches, *b*, so that it forms the back of C. When the machine is full, by loosening the catches, *b*, the stones by their own weight will force open the door, I, and fall in a heap upon the ground. Of course, they can be conveyed to any desirable spot before being dumped. The driver is seated on a seat, J, and carries in his hand a rake, K, provided with a long handle, so that if any stone from size or shape should obstruct the action of the machine, he can fix it in the proper position to be gathered.

The operation is as follows:—To the wheels are attached bars, G, by the pivot, *a*, and these are connected with the scraper, F, which has in it two slots, one each side, that permit it to slide on the sides of C, with its base in contact with D and E, and another slot at right angles to and in these, which allows it to slide over the guides, H, at whose upper end is a movable guide, *h*. When the wheels therefore rotate, they pull the scraper, F, up the inclined slats and with it the stones, and when at the top the end passes over the loose guides, *h*, and on the the top of the stationary guides, H, down again, and drop at the bottom end of H, enclosing all the stones collected by E during the onward progress of the machine.

This is the most perfect stone gatherer we have ever seen, and is the invention of G. W. Bishup, Kent avenue, Brooklyn, L. I., from whom any further information can be obtained. It was patented July 6, 1858.

Nash's Refrigerator and Milk Closet



There are a great number of farmers who, having too few cows to make it worth their while to build a milk-house or dairy, have yet more milk than they use, and wish to keep the surplus for either butter or cheese. For either of these purposes it must be kept cool, which is almost impossible in the house, and therefore there is a great want for a cheap, portable, and cool milk-closet.

The subject of our engraving fully supplies this want. It is the invention of E. H. Nash, of Westport, Conn., and was patented July 27th, 1858. It consists of a simple framing, B, provided with a door, A, the panels of the sides and door being formed of slats like an ordinary shutter blind, these are lined inside with muslin or wire gauze, and a shaft is placed upright in its center, carrying the shelves, C, which are, with the shaft, capable of revolving. On these shelves can be placed the milk, meat, or other substance which it is desirable to preserve; and if the closet be placed in the open air, the continual draft through the slats will keep the contents cool, while the gauze prevents the entrance of insects or much dust.

In the hottest days of summer there is always some breeze stirring in the country, which is quite enough to act as a refrigerator, when, as in this contrivance, the articles are kept in the shade. The shelves being capable of revolving, allow of articles being easily placed on and taken off without disturbing the position of others. It is a most convenient and useful appliance, and serves as a meat-safe equally as well as a milk-closet, and, in fact, is generally useful "to have about the house."

Any further information can be obtained from the assignee of three-fourths of the patent, W. Wood, of Westport, Conn.

The Inventor of Cotton-Spinning Machinery.

At the soirée of the British Association, now holding its meetings in Leeds, England, (and of whose proceedings we shall give more information) there were exhibited the patents granted in 1738 and 1758 to Lewis Paul, the original inventor of the cotton-spinning machine for which Arkwright now has the credit; together with autograph letters from Dr. Johnson to the Duke of Bedford, recommending Paul to his notice as the inventor of the mechanism.

Decease of a Great Engineer.

Foreign papers announce the death of Mr. John Macgregor of the firm of Todd & Macgregor, Glasgow, the greatest builders of iron steamships in the world. This firm was the first to commence building large iron steamers; this was in 1839, since which period, they have constructed 100, varying from 1,600 up to 3,000 tuns burden. They are the principle owners of the steam line between this city and Glasgow. Mr. Macgregor had charge of constructing the hulls, his partner that of the engines, but both were thorough bred practical engineers.

Agency for Patents.—Messrs. Wethered & Tiffany inform us that they have established an agency for the introduction and sale of patents in California. Their office is in San Francisco, where the business of introducing inventions on the Pacific coast will be carefully attended to. This agency we hope will succeed, as there is a wide field for invention opening in that region.

Great Artesian Well.—An artesian well lately opened at Bourn, England, sends the water 25 feet above the surface, and discharges 360 gallons per minute, or 21,600 in one hour. It feeds three mills, and is said to be the greatest well of the kind in the world, excepting the celebrated one in Paris.

The iron mountain of Missouri is exciting a great deal of interest in foreign journals.

Issued from the United States Patent Office

FOR THE WEEK ENDING OCTOBER 19, 1858.

[Reported officially for the Scientific American.]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

EXTRACTION OF VOLATILE OILS, &C., FROM COAL—Luther Atwood, of Brooklyn, N. Y.: I claim, first, The gradual and progressive formation at a comparatively low temperature of oleaginous vapors, and oil from coal, or other substances yielding pyrogenic oils, by the gradual and progressive action of the heat of products of combustion upon and through the mass substantially as described, and substantially for the purposes set forth.

Second, The immediate removal of the oleaginous vapors and volatile products of decomposition from the point of formation away from further action of the heat conducing to and resulting from their production, through the remainder of the mass and apparatus, by means of a properly regulated current of products of combustion, substantially as described.

Third, Condensing the liquid volatile products of distillation within the body of the distilling tower, and during the continuous distillation of the solid materials, substantially as described.

Fourth, Obtaining crude oil from coal, and other solid substances yielding pyrogenic oils, by the combined and successive operation of the above-mentioned methods of treatment.

SKELETON SKIRTS—E. G. Atwood, of Derby, Conn.: I do not confine myself to any form for the metal clamps, a a.

But I claim a skirt formed of tape, or similar material, and a series of circle hoops, when the tape is passed over one hoop and under the next below it, in opposing oblique directions, and the tapes fastened at the points where they interlock on the hoops themselves, by clasping, sewing, or tying, substantially as and for the purposes set forth.

[This invention consists in connecting and suspending the hoops of a skirt, or any number of them, by passing straps of tape, or other fabric, over one hoop and under the next below it, in oblique directions, continuously around the whole, or any portion of the skirt, and interlacing those which connect each with the hoop above and with the hoop below at the points where they respectively pass over and under the hoop, and securing the so interlaced tapes to the hoops at these points by means of metallic clasps.]

SEEDING MACHINES—A. G. Babcock, of Galesburgh, Ill.: I claim the described arrangement of the form rollers, A A, grooved cylinder, D, elastic wipers, 3, hopper, E, guide plate, H, drags, i, and windlass, K, when constructed as and for the purpose set forth.

COFFEE POTS—Nelson Barlow, of New York City: I claim the tubular condensing vessel, B c, in its specified arrangement, when cold water is used in the same, and the discharge is graduated in the manner described.

GAGE FOR CONTENTS OF CASKS, &C.—John K. Barney, of Warren, R. I.: I claim the double rods, with a ns, tubes, and index, as described, and their combination in the instrument, by which the cask is measured in length and diameter outside or inside, in manner set forth, and the construction of the tables with slides, by which is found by inspection the mean diameter, the proper allowance for thickness of staves or head, and the quantity of contents of the cask, from the given or ascertained admeasurement.

COMPOSITION FOR PAINTS—James K. Beardsley, of New York City: I claim the composition of matter substantially such as described, to be used alone as a white paint, or in admixture with pigments for colored paints, as set forth.

MODE OF OPENING AND CLOSING FARM GATES—William T. Boggs, of Cincinnati, Ohio: I am aware that levers have been applied to gates, connected with cords, and arranged in various ways, for the purpose of allowing the gate to be opened and closed by persons from a vehicle or on horseback; I therefore do not claim, separately, the levers described.

But I claim the grooved cylinder or cam, C, actuated by the loaded pawl arm, E, and used in connection with the lever, F, and arm, G, as and for the purpose set forth.

I also claim, in combination with the cylinder or cam, C, pawl arm, E, lever, F, and arm, G, the drop latch, I, arranged with the levers, k l, so that the latch may be operated automatically, as described.

[In this invention a zig-zag grooved cam or cylinder is placed near the post to which the gate is hung, this cam being connected with a lever, which is pivoted to an arm attached to the gate, these parts being used in connection with an automatic catch or fastening, and a loaded pawl arm for actuating the cam or cylinder, whereby the gate may be opened or closed from either side, either from a vehicle or horseback.]

MANUFACTURE OF WROUGHT NAILS—Otis Breden, of St. Louis, Mo.: I claim, first, The die faces, a b c and d, constructed and fitted as described, operated in connection with the slides, k l and J, the crank, m, and the cams, C D C D.

Second, The use of the bar, n, for moving out the arm, o, and the spring, P, for forcing in the chisel, q, which is attached to the arm, o, to cut off the nail.

Third, The attachment of the rod, i, to the crank, s, working the feed gearing, g g, causing the rollers, e e, to revolve and feed the iron from the furnace, M, into the die faces, a b c and d.

Fourth, The employment of the header wheel, a a, and the operation of the rods, f f, attached to the crank, s s, for moving the same around, in order to bring the nail opposite the header die, c c.

Fifth, The employment of the header die, c c, with the slide, d d, for the purpose of forming the head, together with the pawl, y, for holding up the slide, d d, and the motion of the cam, X, in lifting the trigger of the pawl, y, leaving the slide, d d, free to be forced in to head the nail by the spring, e e.

POSTS FOR CLOTHES' LINES—Benjamin Chesnut, of Philadelphia, Pa.: I claim the post, B, with its row of inclined teeth, and its roller, m, and pawl, e, and the brackets, a and a', with their rollers, when the several parts are combined and arranged substantially as and the purpose set forth.

ARRANGEMENT OF MEANS FOR MAKING TIGHT JOINTS AROUND THE FAUCETS OF WATER-COOLERS—John S. Clark, of Philadelphia, Pa.: I claim the projection, g, ring, h, and cap, i, as an arrangement of means for allowing of the making of a perfect joint, as described.

CUT-OFF VALVES FOR STEAM ENGINES—Benjamin Bunce, of New York City; I claim combining with a slide valve of ordinary character, a cut-off valve, constructed substantially as described, that is to say, the slotted tube, secured in a fixed position upon the slide, said tube having its ends so closed that the steam shall pass to the valve through the slots, and having also upon it a cylinder slotted in like manner, capable of being revolved thereon, so that the opening and closing of the slotted passages shall be effected by the action of the slide valve itself in carrying the cut-off to and from the stops set to intercept the revolving cylinder, as set forth.

LIQUID GAGE—Erastus T. Bussell and Joseph Smith, of Cincinnati, Ohio: We claim the double spring valve, composed of valves, F F, springs, S, and rod, E, or their equivalents, combined with a measuring faucet, as shown and described.

CARPET-SWEEPER—Augustus C. Carey, of Ipswich, Mass.: I claim, first, Placing the revolving brush at the extreme front of the box, A, and hanging it in adjustable bearings, H, in the manner substantially as set forth.

Second, I claim the deflector, I, operating substantially as described for the purpose specified.

Third, I claim the combination of the revolving brush, the double pulley, a b, or its equivalent, and the roll, B, when so arranged that the brush may be disconnected from the roll, B, and be operated by hand, substantially in the manner and for the purpose specified.

LUBRICATOR—Elias Clampitt, of Baltimore, Md.: I claim the peculiar construction of my valve, E, and the introduction of hollow tube, G, into stem J (in connection with valve, E), with its openings, c', and flange below, acting as a valve against the lower end of shaft, J, supplied with a spiral spring, F, at top, producing thereby a self-acting valve, when the pressure on cup, A, is removed, as described.

MANUFACTURE OF SHEET IRON—Josephus Chandler, of Attica, Ohio: I claim coating or covering bars, plates or sheets of iron, or either of them, before, at, or during the manufacturing process of heating and rolling, with clay, iron ore, or other mineral matter, salts, and also with the chlorides or other compounds of zinc, tin, &c., or of their mixtures with other mineral matter, for the purpose substantially as set forth.

HAMMERS—Josiah P. Clark, of Portland, Me.: I claim the combination with an ordinary hammer of the metallic plate, d d d, with an opening, a, and slide, b, constructed and operating substantially as set forth and described.

HORSE COLLARS—C. K. Cuckler, of Columbus, Ohio: I am aware that collars have been made to adjust laterally, and also longitudinally.

But I am not aware that collars have been made to adjust so as to contract or expand the collar in two ways, to suit any particular occasion; consequently I do not wish to claim either the side or breast plates individually.

But I claim the combination of the breast plate, E, springs, D D, side plates, a a, and springs, c c, when the whole are arranged, constructed and operated in the manner specified, and for the purpose set forth.

MACHINES FOR LIFTING HEAVY WEIGHTS—T. J. Davis, of Scroepell, N. Y., and J. B. Warner, of Volney, N. Y.: We claim the combination of lever, D, operating horizontally, and lever, C, moving parallel to each other in a line with the fulcrum, and catching alternately into ratchet, B, as they are made to reciprocate by the vibrations of lever, D, as described and set forth.

HAMMER HEADS—Rufus Dawes, of Washington, D. C.: I claim as a new article of manufacture a hammer head, with its face inclined to the longitudinal axis of the head, in the manner set forth.

PLOWS—John Dickson, of New Castle, Pa.: I claim the use of a double movable land-side for increasing the size and weight of the plow, in the manner described.

MARINE PROPELLER—John Eaton, of Belleville, Canada: I am aware that it has long since been proposed to propel boats and other vessels by means of reciprocating, and also by means of rotating pumps, discharging a stream of water from the stern, and therefore I do not wish to be understood as making claim, broadly, to such method of propulsion.

But I claim propelling boats by means of paddles or vanes rotating in and surrounded by a casing provided with an aperture or apertures near the center to receive the water, and with a radial spout for the discharge, when such rotating vanes or paddles and surrounding case are placed at the stern, and outside the boat or vessel, substantially as described.

I also claim making the said case which surrounds the paddles or vanes so that it can be turned to place the discharge spout in any desired direction relatively to the plane of the keel, substantially as described, for the purpose of propeling the boat or vessel either forward or backward without reversing the direction of the propeller, and also for steering or turning, as set forth.

PADDLE WHEEL—H. Ehrhart, of Muscatine, Iowa: I claim the described system of lever-like arms, E E, carrying the floats, F F, pivoted to the body of the wheel, and combined with each other by the floats, F F, and rods, G G, and operating substantially as described, in combination with the guides, H H, for the purpose set forth.

[This invention consists in a certain system of lever-like arms carrying the floats, and combined together and with the wheel, to operate in combination with fixed guides attached to the vessel, so that the floats shall be kept vertical, or nearly so, and be compelled to move horizontally, or nearly so, in the water, and thus be caused to act with the greatest amount of propulsive effect.]

HARVESTERS—Rosewell H. Fisher, of Claremont, N. H.: I claim, first, The combination of the connecting rod, e, slide, bar, c, eccentric wheel, d, rod, f, and lever g, with the cutter, k, for the purpose of throwing said cutter bar in and out of gear, when the several parts are arranged and operated as set forth.

Second, The arrangement of the plates, h, the cutters, i i i, the slotted wheels, n n n, and the cutter bar, k, with the fingers, j j, the same being conjoined, conjoined, constructed and operated in the manner and for the purpose described.

Third, I claim securing the reel, H, to the wheels, J J, when it is operated and adjusted by the means set forth, and for the purpose specified.

FURNACES FOR TEMPERING STEEL—Perry G. Gardiner, of New York City: I claim, first, The heating of steel for the purposes of preparation, for hardening, tempering, or annealing in a closed chamber or oven of fire-brick, or other suitable material, impervious to the flame, smoke, and gases of combustion; the smoke, flame, and gases of combustion being distributed over the exterior surface of the floor, roof, and rear of the heating oven, by means of vertical and return or reverberatory flues between the fire chamber and chimney, as described.

Second, I claim the perforated air tube, b, placed at the foot of the vertical descending flues on the side of the bridge wall opposite the fireplace, in combination with the fire chamber and flues, and between the fire chamber and oven, operating in the manner set forth.

PHOTOGRAPHIC SHIELD—Ebenezer Gordon, of New York City: I claim the corners, d d, formed with two recesses, and applied at the angles of a square frame, to receive the photographic plate, or its equivalent, in a horizontal or vertical position, as set forth.

WRITING TABLE—Jacob S. Haskill, of Salem, Mass.: I claim the arrangement of the circular bolt with, and for fastening of the several drawers, substantially as and for the purposes specified.

STAVE-JOINTER—William Halderman, of Freeport, Ill.: I claim the combination of the rotating conical cutter heads, I I, and the polygonal feed wheel, E, arranged for joint action substantially as and for the purpose set forth.

[By the employment in this invention of a rotating polygonal feed wheel in connection with conical cutter heads, staves may be jointed in a perfect manner, and also dressed or cut in a proper taper form for the bilge.]

APPARATUS FOR MAKING GLASS STOPPERS FOR BOTTLES, &C.—Thomas R. Martell, of Philadelphia, Pa.: I claim the block or die, C, with its vertical recesses, in combination with the spindle, D, its grooved disk, d, and the radial punches, a a, when the whole are arranged for joint operation substantially as and for the purpose set forth.

SEWING MACHINES—George W. Hubbard, of West Meriden, Conn.: I claim operating the looper by means of a pin working in conjunction with the needle, in the manner substantially as described.

CONSTRUCTION OF METALLIC SIDE PAVEMENTS—Peter H. Jackson, of New York City: I do not claim a sidewalk or platform of metal, as this has long since been known and used.

Neither do I claim any device for sustaining said metallic sidewalk at the gutter, and side next the house.

But I claim the combination of the tie rods, h h, and brackets, g' g', formed on the undersides of the plates, a a, with the staunchions, K K, acting to connect said plates to each other, straighten said plates, and strain the said tie rods, h h, substantially as and for the purpose specified.

BOTTLES FOR CONTAINING MERCURY—Isaac G. Johnson, of Spuyten Duyvil, N. Y.: I claim the mercury bottle formed and composed of malleable cast iron, substantially in the manner and for the purpose set forth.

WATER GAGES FOR STEAM BOILERS—J. Johnson and R. Lapham, of New York City: We claim the hollow plugs, h and h, with conical stem fitting into the glass tube, and the elongated hole or passage, h2, in combination with the screw, k, for adjusting the plugs, operating as described, and for the purposes set forth.

HOISTING JACKS—William Kearney, of Newark, N. J.: There being no novelty in the construction of the parts, separately considered, except perhaps in the adjustable crank; I therefore do not claim them singly.

I claim the combination of the screw shaft, two or more concave faced worm wheels, two or more worms of different threads, the journals of the worms in eccentrics, two nut cases or boxes with an adjustable crank, in the manner and for the purpose specified.

RE-SAWING MACHINE—William D. Leavitt, of Cincinnati, Ohio: I claim the combination of the yoked feed rollers and clamps extending up to or near the perimeter of the saw, for the purpose of feeding through and pressing out all the warps or bends in the board or plank, and holding them so pressed out until the same acts substantially as described.

I also claim the combination with the yoked feed rolls and clamps operating together, as described, the auxiliary feed rolls, I I', to receive and feed in the next succeeding board or plank without affecting the action of the other rolls on the plank or board being sawed, substantially as described.

HOOP SKIRTS—George Mallory, of Watertown, Conn.: I claim the construction of one or more of the hoops or springs, A' A', of a skirt, with elastic pieces, a a, or their equivalent, arranged one on each side, so as to provide for flexure of said hoop or hoops over the edge of a seat, when its or their back parts are sat upon, without impairing their flexibility, in an upward and downward direction of any other parts than those where the flexure is immediately required, substantialiy as described.

[This invention is intended to remedy a great defect which exists in all the skirts heretofore manufactured with hoops or springs of metal. Owing to the inflexibility of such hoops or springs in an upward and downward direction, the fronts of those whose back ; arts are sat upon, when the wearer sits down, are thrown upwards, and caused to raise the front of the dress in an objectionable manner. This invention consists in constructing one or more of the hoops or springs of a skirt in such manner as to preserve, as far as necessary, its inflexibility in an upward and downward direction in all parts except a convenient point in each side, where they are made flexible in such direction, in order that they may bend, and allow the front portion to hang down over the front of the seat when the wearer is sitting down.]

MAIZE HARVESTERS—C. B Matthews, of Oquawka, Ill.: I am aware that saws and stationary cutters have been previously used for harvesting corn or maize, and I am also aware that arms have been used to gather the cut stalks and eject them from the machine, as shown, for instance, in the harvesters of J. V. Adair, patented April 6th, 1858. I do not claim, therefore, the circular saw, K, nor the stationary cutters, M M.

Nor do I claim, separately and irrespective of arrangement, arms for throwing the stalks on the platform.

But I claim the saw, K, and stationary cutters, M M, in combination with the revolving arms, l, attached to shafts, N N, when the several parts are arranged to operate as and for the purpose set forth.

I also claim, in combination with the above, the sliding bars or slats, b, connected with the lever, F, and arranged with the opening, E, in the platform, A, as and for the purpose described.

[A rotary and stationary cutter, sliding bed, and revolving arms are employed in this invention, all being attached to a suitable platform on wheels, whereby, as the machine is drawn along, standing corn may be cut with great facility, and in a rapid and perfect manner.]

BEDSTEAD—Rufus Maxwell, of Tucker County, Va.: I claim the construction and arrangement of the end rail, C, with the notch, d, the side rail with the tenon, B, substantially as described, as and for the purpose specified.

COMBINED MOP AND BRUSH—Henry McClay, of Niles, Mich.: I claim the tri-lateral block or head, A, attached at one side to the handle, B, and having a brush formed on one of the other sides, the remaining side being corrugated and having a cloth, C, attached, the whole being arranged as and for the purpose set forth.

[This device has a block or head of triangular form with a handle fitted into it, one side of the head being provided with bristles and forming a brush, and another side being corrugated and having a cloth attached to one end; the cloth and head is rendered capable of being so adjusted that the device may be used both as a scrub brush and mop.]

FIELD FENCE—John B. Mitchell, of Wayne, N. Y.: I do not claim constructing fences in separate sections or panels and uniting them in the posts in any other than the specific manner which I have described, that is—

The combination of the slotted post, D, with the panels, when constructed with the slides, c, and auxiliary battens, a and b, so as to form a fence readily convertible from a straight to an angular one, substantially in the manner and for the purposes set forth.

ROLLS FOR PLANISHING IRON—James Noble, of Monongahela Borough, Pa.: I claim the use of rolls having a straight groove, depression, or recess extending parallel to its axis for the entire length of the roll, or at least for the length of the other roll of the pair into which the other roll is placed before they are pressed together for the purpose of securing a degree of pressure adequate to the planishing of single sheets of metal, in the manner described.

COFFEE ROASTERS—C. J. C. Peterson, of Davenport, Iowa; I claim the application of a damper constructed and operating substantially as set forth to the drum of a coffee roaster.

I also claim the spring catch, h, and block, n, in connection with the sliding door of the drum, constructed and operating substantially as described.

PLOWS—Wm Reaney, of Berzelia, Ga.: I am aware that movable mold boards are not new; therefore, I do not claim, broadly, the mere adjustment of the moldboard, or other parts of the plow, in order to change the form of the latter, but I limit my claim to the described plow, the parts being made adjustable in the manner set forth.

I claim, first, The mode of varying the form of the plow by the use of the adjustable colters, Figs. 3 and 4, the latter being provided with the sub-soiler, E, and the several parts constructed and arranged for operation, substantially as set forth.

Second, I claim the use of the wedge, C, in combination with the moldboard for adjusting the entire front part of the moldboard to correspond with the adjustment of the colters, as described.

RAKING ATTACHMENT TO HARVESTERS—A. R. Reese of Phillipsburgh, N. J.; I claim the combination of the vibrating arm, C, the rake, K, the link piece, J, and the crank, F, when the several parts are constructed, arranged and operated substantially as described.

CLASPS FOR METALLIC OR OTHER FLEXIBLE BANDS—Albert C. Richard, of Newtown, Conn.: I claim the use of frame, a, and ring, b, in combination with band, e, substantially as described.

BURGLARS' ALARM—H. R. Robbins, of Baltimore, Md.; I claim the manner specified of combining and arranging relatively to each other on a door, G, and door frame, G', or other structure, the alarm movement, cap nipple, K, exploding spring hammer, H, and stop or set pin, J, for the purpose set forth.

[By this invention, simultaneously with the operation of setting the hammer so as to explode a cap, the verge of the alarm movement is caused to lock the verge wheel, and thus prevent the running down of the spring, and simultaneously with the opening of the door and the explosion of the cap, the verge wheel is unlocked and the alarm movement caused to give a continuous alarm. This arrangement differs from and is superior to all devices before used, it being readily attached to any door, and costing very little more than an ordinary cheap clock movement, and serving to give a sudden start to the sleeper when a burglar enters the room, and then keeping up a continuous alarm until he is fully aroused, and made aware of his danger.]

SEEDING MACHINES—Marshall S. Root, of Medina, O.: I claim the bent arms, Q Q, arms, P and U, rod, O, and spring, R, when these several parts are arranged as described for operating the corn planter and sower, and combined with the revolving harrow, as set forth.

METHOD OF OPENING AND CLOSING FARM GATES BY APPROACHING VEHICLES—E. C. Rowland, of Phelps, N. Y.: I claim the connections described of the levers, D E, and the endless chain as connected with the gate, for the purpose of forming self-opening and shutting gates.

SUBMARINE EXPLORER—Van Buren Ryerson, of New York City: I do not wish to be understood that I limit my claim to the special form and construction specified, as these may be greatly varied within the range of my invention, so long as the principle or character of my invention is retained.

What I claim is the method of controlling the rising and sinking power of the apparatus, by means of a reservoir or reservoirs of compressed air, connected and combined with a working chamber or chambers and rising and sinking therewith, substantially as described, so that the operators within, by the use of the compressed air can readily control the rising and sinking power of the apparatus without communication with the surface, substantially as set forth.

I also claim a submarine explorer, in which the rising and sinking power is controlled by a reservoir or reservoirs of compressed air making part thereof, and rising and sinking therewith, and in which there are two or more working chambers, substantially as described; the dividing the said working chambers by a hatchway, which can be closed water and air tight, substantially as described, to sustain the apparatus with the top above water, when said top is open for any purpose, as set forth.

I also claim, in combination with the reservoir or reservoirs of compressed air, connected and combined with one or more working chambers, and rising and sinking therewith, substantially as described, the employment of one or more ballast chambers at or near the bottom, and so arranged substantially as described, that at the will of the operators they can be made to communicate with the compressed air reservoir or reservoirs and with the surrounding water as described, to increase the lifting or sinking power of the apparatus, as set forth.

I also claim, in a submarine explorer, combining with the working chamber or chambers thereof, the employment of a spray or shower of water, which at the will of the operators inside may be discharged at any time required to purify the air by absorption, substantially as described.

I also claim, in combination with the reservoir or reservoirs for compressed air, combined and moving with one or more working chambers, the employment of a pump which can be worked by the operators within, and which communicates with the reservoir or reservoirs of compressed air, and also by means of a flexible pipe and float provided with a self-acting valve, with the atmosphere above, substantially as described, so that in case of accident the operators within can replenish the air in the reservoirs to enable them to control the apparatus, as described.

METHOD OF APPLYING ELECTRICITY DURING EXTRACTION OF TEETH—J. S. Simmerman, of Glassborough, N. J.: I claim applying electricity to the gums or teeth or both, during the operation of extracting teeth, by means of the insulated, adjustable spring clip described, or its equivalent, the said clip being connected to one of the poles of an adjustable electro-magnetic machine, or its equivalent, as set forth and for the purpose specified.

HARVESTERS—J. D. Smith, of Lancaster, Ohio: I claim having a horizontal joint in and near the center of the reel frame piece, P 2, substantially as and for the purposes set forth.

UMBRELLAS—Henry Steele, of Jersey City, N. J.; I claim the combination of a lock with a closing catch of an umbrella, for the purpose specified.

MACHINE FOR CUTTING STAVES FROM THE BOLT—Wm. Steele, of Wheeling, Va.: I do not confine myself to cutting wood in any particular form or shape.

But I claim, first, The use of an apron, M, hinged to the bed plate, K, as described, or otherwise attached to the machine in such a manner that it can be held under or back of the knife to support the piece during the process of cutting, and then swing down or fall back to allow the piece to drop from the knife.

Second, I claim the combination of the levers, L L, and stops, B and D, as described, or their equivalents.

Third, I claim my improvement to be applicable to machinery for cutting steamed wood, for any or all of the purposes for which it is now (or may be) cut.

CULTIVATORS—T. S. Stevens, of Pepperell, Mass. : I am aware that for cutting sods and roots, a series of stationary surface cutters like under surface plows have been used in connection with a set of vertical scoring knives, and on one frame therewith. Consequently, I do not claim such. Each of the knives of the rotary drum is a spiral or helical knife, or so formed as to cut in a curved instead of a horizontal path, and it passes into and out of the soil during each rotation of the drum. Therefore its action on the soil is different from that of a stationary horizontal knife or plowshare, which works in a horizontal path only under the surface and in connection with the vertical cutters separates the soil into ribbands or strips. The rotary cutters of my machine uot only perform the function of the stationary plow cutters, but they break or cut the soil in curved paths so as to reduce the strips to pieces, and they raise these pieces and turn them over more or less, whereby the roots will also be separated and thrown out of place.

What I claim is the combination of a set of vertical stripping cutters, a a, and a set or series of revolving under-surface cutters, b b, applied to operate together, substantially as specified.

HYDRANTS—James Swan, of Brooklyn, N. Y. : I claim the use of the elastic tube, in combination with the metal or rigid tube, A, for the purpose of excluding water from the entire length of the hydrant, when arranged, combined and operated substantially as described.

PAPER FEEDER FOR PRINTING PRESSES—Lemuel T. Wells, of Cincinnati, Ohio : I claim, in the described connection with the cylinder of a printing press, the vibrating frame, A, bearing the nippers, 10, and opposing bar, A', and operated substantially in the manner and for the purpose set forth.

NUT MACHINES—S. H. Whitaker, of Cincinnati, O. : Being aware that nuts have long been forged with very little waste, by a skillful and laborious process on the anvil, I disclaim effecting such results apart from automatic means.

But I claim, first, The die-box, N, e f g, and punch, D, or their equivalents, operating as set forth, so as to embody the greater portion of the wad or core, in the nut or bar, while confined on all sides save one, in the act of punching.

Second, The arrangement of the punches, D G and I, dies, E, and H, and perforated bridge, N, or equivalent devices operating together substantially in the manner described, for the automatic and economical manufacture of hot-pressed nuts.

DEVICE FOR ADJUSTING TO A RIGHT ANGLE THE JOINER'S SQUARE—L. Yale, Jr., of Philadelphia, Pa. : I do not claim making the angle of a square adjustable, as that has been frequently done before.

But I claim extending an arm a', or its equivalent, to act as a lever, along the handle or stock far enough to insure the proper effect of the adjusting screws or their equivalents, for the purpose and substantially as described.

BANK LOCKS—S. S. Burlingame (assignor to bimself and Wm. Taylor), of Warwick, R. I. : I claim one or more pairs of spring slides, q q, to close the key-hole, Z 2, provided with pins to enter the notches, n n, and lock the collar or working key, W, the slides being so constructed as to be pushed open by the point and bits of the key, Z, when it is inserted as described.

I claim the collar or working key, W, in combination with the palls, p p, so constructed and arranged as to be pushed out by the bits, V V, of the key, Z, when it is inserted as described.

I claim closing the key-hole, and locking the working key, T, by the sliding tube or collar, S', pushed out by a spring, and locked in the key-hole by the bolt, V, as described.

I claim fastening the working key, T, to the back plate of the lock by means of a flange and plate, substantially in the manner described.

MANUFACTURING CAR WHEELS OF CAST IRON—G. S. Bosworth (assignor to Anson Atwood), of Troy, N. Y. : I claim the employment of highly heated "chills," when combined with sand molds, in the manner and for the purposes set forth.

LATHE FOR CUTTING SCREWS FROM WIRE—George W. Daniels (assignor to himself and Abraham Fuller), of Waltham, Mass. : I am aware that handles for toolholders have been made with a holding and centering apparatus of the kind substantially like that described as applied to the arbor of a lathe, with the exception that the bore of their spindle did not extend through such, therefore I do not claim the said holding and centering apparatus either alone or in connection with a tool handle. I am also aware that a lathe arbor has had a passage extended through it longitudinally aud axially, and that such passage has opened into a hollow hub or "boss" containing two metallic bearings, one of which was forced towards the other by a screw arranged transversely on the arbor, the whole being simply for clamping a round shaft on a lathe in order that a concavity might be turned in one end of it. But such devices could only center or bring into one straight line, on the axis of the arbor, a shaft of but one diameter; therefore I do dot claim this latter contrivance, it being shown in Henry A. Case's rejected application. My improved lathe with reference to a round rod extending through the arhor, can perform a function not incident to the lathe of the said case.

I claim combining with a lathe arbor devices made and applied to it substantially as described, so as to enable rods varying in diameter to be securely clamped and centered in the arbor, and to extend entirely through it in manner as specified.

CHRONOMETER ESCAPEMENT—Thomas Morrison (assignor to A. S. Solomons), of New York City : I claim, first, Vibrating the detent of a chronometer (or single beat) escapement by direct mechanical action, substantially as described.

Second, I claim the detent lever vibrating on pivots or a staff, when operating in the manner set forth.

Third, I claim the arrangement and operation of the pallet, n, in the manner and for the purposes specified.

DESIGN.

LOCKETS—R. C. Randall, of Providence, R. I. Dated Oct. 19, 1858.

BLACKING.—Take ivory black, 12 ounces; olive oil, 1 ounce; molasses, 8 ounces; gum arabic (in powder), ½ ounce; vinegar, 2 quarts; sulphuric acid, 1½ ounce. Mix the first four ingredients into a paste, then add gradually the vinegar, stirring the whole well together; lastly, add the sulphuric acid. Blacking for dress boots and shoes:—Gum arabic, 8 ounces; molasses, 2 ounces; ink, ½ pint; vinegar and spirit of wine, of each two ounces. Dissolve the gum and molasses in the ink and vinegar, then strain and add the spirit.

Agricultural Chemical Science.

The following is the substance of a lecture recently delivered by Professor Anderson, chemist of the Highland Agricultural Society in Great Britain; the subject is an all-important one, namely, the food of plants:—The constituents of plants are divided into two great classes, organic and inorganic, the latter—lime and alkalies—being fixed, the other can exist in a free state, or in certain compounds in the gaseous or volatile form; the carbon of plants is largely obtained from the carbonic acid of the air. In regard to the amount of ammonia in the atmosphere, as referred to by Liebig, Boussingault, and Barral, their experiments had been repeated by Mr. Way, who found that the annual quantity of nitrogen carried down by rain in 1855, was 6·63 lbs. per acre; of this 5·85 were in the form of ammonia, and only 0·78 as nitric acid. An extension of these experiments during 1856 gave 8·31 lbs. Boussingault has experimented on rain water, also on fogs and dew; the water of a particularly dense fog which fell at Paris on January 25, 1854, giving 138 parts of ammonia per million, and a fog on December 19th, giving 13 parts of ammonia per million. In the case of dew the results are similar, though not so striking, both fog and dew possessing more of these constituents than rain. The result of the various experiments, though not bearing out Barral's view as to the quantity of ammonia and nitric acid present in the air, yet shows that what does reach the soil of these is of importance in an agricultural point of view.

As it regards the qualities of soils for absorbing gases, Professor A. is of opinion that their power of absorption is not due, as is generally supposed, altogether to the argillaceous part of the soil, but to many of its constituents; also that plants absorb their food from insoluble substances, by exerting a positive chemical action on them. It is not uncommon to see a turnip throwing out a mass of fibers to surround and embrace a fragment of bone, which they are doubtless dissolving and absorbing into the nutriment they require. Soluble manures, however, afford a readier nutriment, and also are more equally distributed through the soil, preventing the plant stretching its roots into new regions in search of substances which it cannot find in sufficient quantity. For this reason a concentrated manure, such as guano, of which the quantity used per acre is so trifling, should be mixed with some other substances, to give it bulk. Professor A. was inclined to attribute the benefit derived from the mixture of salt with guano, in cases in which the former is, of itself, without effect, merely to its action as a dilutent, and he would urge the importance of always reducing guano to fine powder, and mixing it with two or three times its own weight of dry soil before use. The result of experiment shows, moreover, that the quantity of nitrogen which passes from the soil by drainage greatly exceeds that which the rain brings down. This nitrogen must be derived mainly from the manure. Hence the necessity of attending to the condition in which we employ nitrogenous manures. For instance, it would be absurd to use a nitrate early in the season, or long before the time of sowing, and, even if applied simultaneously with the seed, the chances are against a successful result, because a continuance of rains might have the effect of washing it entirely away before the young plants were in a condition to make use of it. On the contrary, a nitrate ought to be used as a top dressing when the crop is in full growth and during the summer months, not only because the plant can then most rapidly and effectually seize upon it, but also because that is the period of the year during which little or no water escapes by the drains, and nearly the whole of the rains which fall go off by evaporation, leaving, of course, the nitrate unchanged in the soil.

The lecturer then noticed the controversy between Liebig, on the one hand, and Lannes and Gillet on the other, on what is called the "mineral theory;" the former maintaining that, while we must supply the inorganic food of plants, in the shape of manure, we may safely trust to obtaining a sufficient supply of ammonia for even the most abundant crops from the air alone—choosing, however, latterly to assume nitrogen as a mineral. Now, no one doubts that the air will afford a sufficient quantity of ammonia to produce an amount of vegetation such as the soil produces in its natural state, but the case is different when the abnormal crops which improved agriculture requires, are raised, and it cannot be doubted that Liebig has adopted a most inadvisable course when he counseled farmers not to bestow their chief attention on ammonia and nitric acid. The true practice is that which supplies all the constituents of the food of plants in quantities at least equal to that in which they are removed, and it is the practice in actual operation on all good farms.

Professor Anderson then adverted to the composition of farm-yard manure, which ought to be allowed to ferment, to increase the nitrogen in which it is deficient when new. This is best done by keeping it under cover, and mixing it with water. A well trodden manure heap loses very little by evaporation, but frequent turning should be avoided, as it allows a considerable quantity of ammonia to escape.

Ice-Houses.

MESSRS. EDITORS—The best time for building ice-houses is now close at hand; and as it is not generally known that with a little additional expense, an ice-house can be constructed so as to answer the double purpose of keeping ice, and preserving milk, butter, &c., I will give a description of one, for the benefit of your numerous readers, which I I built in the Fall of 1856, with a preserving chamber for this purpose.

Ice can be kept in large quantities during the whole summer season in houses built entirely above ground; but where it is desired to have a preserving chamber, and to insure a sufficiently low degree of temperature to attain good results, it is indispensably necessary that the earth should be banked up to the hight of several feet against the outside of the building. In constructing my ice-house, I took the advantage of a convenient and descending spot, sunk a pit fifteen by eighteen, and from four to five feet deep; walled it up to the hight of nine feet, banked the earth up to the top of the wall all around, except a space for the doorway; upon the wall I put a frame six feet high, which gives a hight inside from the bottom to the comb of the roof of over twenty feet. I put in heavy sills in the bottom, except in a space four feet square for the preserving chamber. Upon the sills, I put a floor of two inch oak plank, and on the top of this a floor of one inch pine jointed closely. The floor has a descent of two inches towards the preserving chamber, and it conducts the waste water from the ice to this chamber. I put in an inside frame, and lined it inside; this left a space of six inches between the lining and the wall to fill in with sawdust, and the partition between the ice and preserving chamber is also double, and filled in with sawdust.

To complete the preserving chamber, I first put in clean sand to the depth of four inches, then paved it with medium burned bricks, they being preferable to hard on account of their capacity to absorb and retain a larger amount of water. Pains were taken to have the floor exactly level in the one direction, and also very tight, so that all of the waste water from the ice shall be conducted to and distributed regularly upon the bricks. This keeps them so constantly cold as to preserve milk, during the hottest season, for from thirty-three to thirty-six hours, perfectly sweet, and butter very hard. One valuable feature belonging to the mode of preserving milk and butter is, that during the warmest weather of the summer season, when cold sweet milk and butter of a degree of solidity equal to that of the winter season is appreciated as one of our greatest luxuries, we can have it so from the simple fact that at that particular time the supply of the cold ice water is greatest.

Butter made and kept in this way does not become so soon soft after being brought to the table as that which has been kept in a spring of water, nor do thunderstorms appear to hasten the development of lactic acid. We have noticed no perceptable difference in the length of time which the milk has remained sweet in regard to clear or stormy weather. I have observed at different times, by placing the thermometer within one foot of the bricks in the preserving chamber, that the temperature was about fifty-four degrees, while it was ninety-five in the shade outside. The sand underneath the bricks subserves an important purpose, by retaining the water, and supplying it to the bricks by capilliary attraction at such times, as there is not a great supply coming from the ice.

The space above the preserving chamber should be open and unobstructed to the roof, and over the ice there should be good ventilation to the roof, to carry off all the vapor which may arise from the milk.

An ice-house constructed in this manner is one of the best of investments for a farmer, for besides securing the luxury of preserving milk and butter cool, vegetables of different kinds may be preserved fresh until a succeeding crop grows. I kept last year's beets good during this summer; also cabbages. These latter were laid upon the ice, which imparted to them a crispy sweetness, perfectly delicious in the very warm weather of last June. Vegetables may also be preserved in this manner by farmers, so as to bring them fresh to the market in early summer.

SAML. L. DENNEY.

Christiana, Pa., October, 1858.

To cover Lace or Net with Copper.

This beautiful experiment can be performed by any person in possession of a simple galvanic battery. First make a saturated solution of sulphate of copper in a vessel large enough to contain the net or lace that into be experimented upon fully stretched out. Next stretch the net or lace upon a copper ring; then dust it well over with the best black lead, using a camel hair brush to rub it into every part. This black lead acts as a conductor to the electricity, when the net is attached to the battery. In fixing the apparatus, the ring and net are to be attached to the wire in connection with the zinc end of the battery, and then perfectly immersed in the copper solution. A piece of copper attached to the wire in connection with the copper end of the battery must also be inserted in the decomposing vessel facing the net, but not touching it; this not only acts as a conductor; but also maintains the solution of copper of a permament strength. In a short time the copper will be found to creep over the whole surface of the net. If desired it may afterwards be gilt or silvered by the same process, provided that gold or silver be substituted where copper was previously used. We have little doubt but that this "experiment" will eventually be of the greatest service to commerce and the arts.

SEPTIMUS PIESSE.

The Parasite of a Parasite.

An *acarus* infesting the parasite of the bee has lately been discovered, and a photograph of the insect, magnified one million times, has been taken by Mr. A. Beitsch. It is covered with a carapace or hollow shield, and its feet are armed with sharp claws by which it keeps a firm hold upon the microscopic creature from which it derives its nourishment, and which in its turn prays upon the honey-gathering bee. As we can discover no limits to the minuteness of organized beings, so we can fix no term to this extraordinary series of parasitic animals preying one on the other.

New Inventions.

Railroad Materials.

Z. Colburn, of this city, the eminent locomotive engineer, in a letter to the London *Engineer*, gives some interesting particulars concerning our railroad materials, which may not be known to many of our readers on this side of the Atlantic. He says that the Michigan Central Railroad is now having wrought iron driving wheels placed under their engines, and although they are more expensive, costing about $250 each, yet they are lighter, weighing about 1,200 pounds, while cast iron wheels weigh 1.600 pounds and cost but $50. Some cast iron driving wheels 5½ feet in diameter weigh 1,900 pounds exclusive of the tire, and those 6½ feet in diameter weigh 2,400 pounds each. Cast iron chilled wheels are almost invariably used under American engine bogies, and under the tenders and cars. The cast iron 30-inch wheels weigh 450 pounds, and cost from $12 to $15 each. They are chilled for half an inch in the depth of the tread, and are cooled without much strain from restricted contraction. They will run from 50,000 to 100,000 miles before wearing through the chill. The general pressure of steam in American locomotives is about 110 pounds, even 130, 150, and 200 pounds being sometimes carried in boilers 48 inches in diameter, and of but ½-inch iron. The ordinary locomotive lamp will enable the engine driver to see any large object, such as cattle, at least 1000 feet ahead, on a dark night, and is far superior to the English lamp. On the whole Mr. Colburn makes out an excellent case for American rolling stock, and shows its equality, if not superiority, to that of other countries.

Improved Self-Feeding Drill.

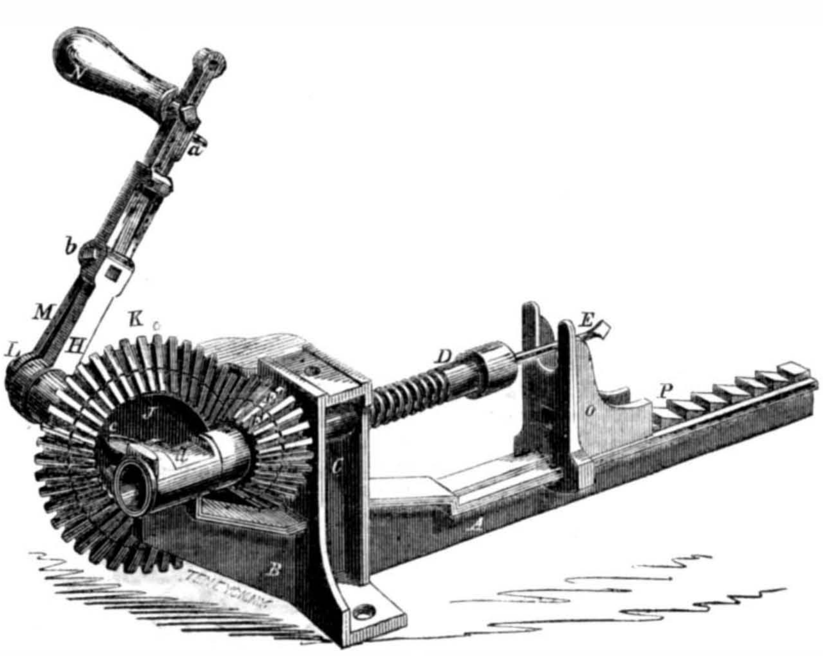
The convenience of self-feeding drills is thoroughly appreciated by all workers in wood or metal, and needs no recommendation of our's to call attention to any new invention or improvement that may be added to them to simplify their construction or extend their use.

The subject of our engraving is a new self-feeding drill, which is capable of being fed as it rotates, or fed more quickly without rotation. It is the invention of William Wakeley, of Homer, N. Y., and was patented November 17th, 1857.

A piece of metal, A, of the shape shown, has a series of wedges or teeth, P, cast on it, and a flange each side, and on these flanges and over the wedges is placed a bed or rest, O, that by means of the wedges it may be secured in any position to hold the stuff to be drilled, thus forming a perfectly adjustable bed. To A is cast another piece, B and C, which serve as bearings for the operating parts. An arbor, D, having a screw thread cut upon it, and a groove down the screw, works through the bearings, C and *d*, and carries at its extremity the drill, E. The bevel wheel, E′, has a feather cast inside it, which fits into the groove, and so when it is rotated it also causes the drill arbor to revolve, and at the same time allows it to slide to its work. Another smaller bevel wheel, F, is also placed on the drill arbor, the inside of which forms a nut for the screw thread of D, and by its revolution the drill is slowly fed to its work.

These two bevel wheels, F and E, are moved respectively by wheels, J K, both placed on the hollow axle of the crank, H, which is rotated by the handle, N. When it is desired to drill with a slow feed, the crank handle, N, is rotated, and by the bevel wheels, J K, both the nut wheel, F, and drill arbor wheel, E′, are rotated, the difference in rate between F and E′ causing the feed motion. When, however, a quick feed is required, J is disconnected from K, and with F it remains stationary, F thus acting as a stationary nut, from which it is fed very rapidly. This is effected by the mechanism about to be described:—J is connected to K by two small pins passing through holes in J into corresponding holes in K, and of course when these pins are drawn out of K, T is not moved. The pins are attached one to each end of a piece, *c*, the center of which is secured to a rod, L, that passes through the hollow shaft of H, and a claw at the end of M fits into a collar on L. M is a lever forming part of the

WAKELEY'S SELF-FEEDING DRILL.



handle or crank, and capable of sufficient oscillation on a center, *b*, to throw *c* in or out of gear by the motion of N, and it can be held in any position by a small spring catch, *a*. By this arrangement the feed motion is perfectly under the control of the operator, and the drill can be placed either horizontally or vertically, as most convenient.

It forms a cheap and valuable addition to the workshop, and the inventor will be happy to furnish any further information upon being addressed as above.

PATENT CYCLO-ELLIPTO-PANTOGRAPH.

Fig. 1

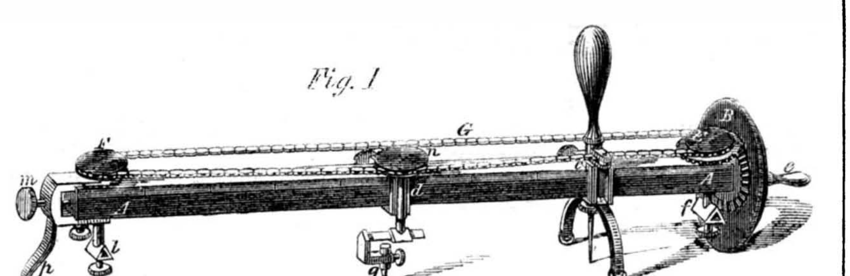
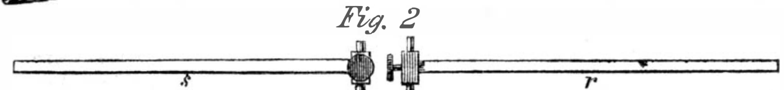


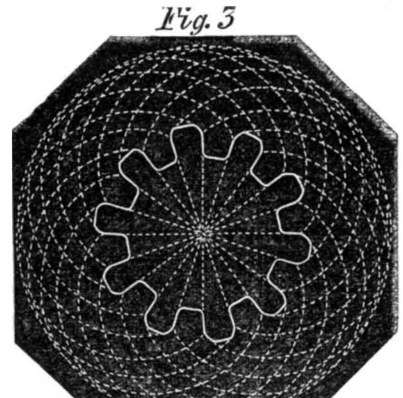
Fig. 2



The instrument of which a perspective view is given in Fig. 1 is designed to serve for drawing ellipses, curves, spirals, and many other figures, or can be employed as an ordinary pantograph, to enlarge or reduce drawings, engravings, works of art or other purposes. It consists of a beam of wood, A, about fourteen inches in length, upon which is a brass frame, *c*, capable of sliding along its whole length, and carrying a point, supported by two friction rollers, as a center. Another sliding frame, *d*, carries a pulley, *n*, in it, to whose axis is attached the sliding pencil holder, *g*. On one end of the beam is an axis, upon which a brass milled wheel, B, is made to revolve by the friction of the paper on which the drawing is to be made. Upon the face of B is a beveled wheel that gears into another beveled wheel on the under side of the pulley, E, to which it gives motion, as well as to the socket, *f*. An endless chain, G, passes over the pulleys, E F, and *n*, which is adjusted to the proper strain by the screw, *m*, at the end of the beam, the socket, *l*, being placed on the axis of F.

The legs, *r*, and *s*, Fig. 2, are only used when the instrument is used as a pantograph. It will be perceived that when the instrument is placed upon the drawing board, the paper takes the place of a wheel, upon which the disk, B, rotates, and which may be of any radius, by sliding the center frame nearer to or further from the disk; thus the ratio of the velocity of the disk to that of the pencil may be regulated by the graduations on the beam. Now, if the velocity be equal, or *c* be placed at the first division, the pencil will make one revolution on its axis, *n*, to one revolution of the disk, B; if *c* be placed at division, 2, the pencil will make two revolutions to one of the disk. The pencil may be made to move in the same direction as the disk or otherwise by placing the endless chain, G,

Fig. 3



against the inner or outer edge of the pulley. *n*.

For the sake of illustration, suppose the arm carrying the pencil to be the radius of a circle rolling upon the circumference of another circle which is fixed, and let us call the rolling circle *the generating circle*, the pencil point *the generatrix*, and the fixed circle *the directrix*. We will also call the distance between the center point and the disk, B, the radius of *the fundamental circle*. When the chain, G, passes over the outer edge of the pulley, *n*, the generating circle is supposed to roll on the convex surface of the directrix, and when it presses against the inner edge of the pulley it rolls on the concave side. When the generating circle has rolled once over, so that every point shall have been in contact with the directrix, the portion generated is called a *branch*. As every revolution of the disk, B, generates a branch of a curve, the number of branches will depend upon the ratio between the fundamental circle and the disk, and is determined by the divisions of the graduation of the beam.

By means of this instrument epicycloid curves can be accurately drawn, so that it becomes suitable for the drafting of cog wheels, as seen in Fig. 3, and it is calculated to be useful to the mechanical engineer, mathematician, architect, designer and artists in general, and also for describing in schools the lines produced by the revolutions of the planets and their satellites.

It is manufactured and sold by James W. Queen, No. 924 Chestnut street, Philadelphia, and each instrument is accompanied by a pamphlet full of illustrations of its powers and explanations of the *modus operandi* to obtain with it any form of curves. This pamphlet will be given separately on application to Mr. Queen. It was patented July 27, 1858.

Casting Heavy Guns.

It is mentioned in a late London paper that all the guns cast at the Royal Standard Foundry, since the opening of that immense establishment, have been condemned as unfit for service, notwithstanding that experiments have been almost daily carried on for the purpose of ascertaining the best description and the proper fusion of the metals required. The makers of American cannon are more successful than this. At a recent trial at Castle Island, near Boston, of a gun of nine inch calibre, for the purpose of testing its endurance, it burst only at the 1531st fire, 1,509 fires having been made with ordinary service charges of ten pounds of powder and a shell weighing seventy pounds, and 22 fires with bursting charges varying from 15 pounds of powder and one shot of 90 pounds, to twenty pounds of powder and ten shot weighing 900 pounds. This last charge very nearly filled the gun up to the muzzle, and burst it. This gun was one of Captain Dahlgren's for marine service, and was cast by Aller & Co. The test was to ascertain the reliability of this formidable engine of war. Guns of this class weigh ninety-two hundred pounds, and there was consumed in the test no less than fifteen thousand four hundred pounds of powder, while the aggregate weight of shot and shells fired amounted to one hundred and fifteen thousand pounds. Government has also been trying the new rifle cannon of Mr. Sawyer, at Fitchburg, Mass. The cannon is grooved like a rifle, and the bullet is shaped like the Minie rifle ball. It is filled with powder, which explodes after striking and entering an object. It is said that at one mile the body of an ordinary sized tree would not be missed once in fifty shots, and experiment has proved it to be nearly so. This is the closest shooting with heavy cannon known in the service.

A Sensible Memorial.

The cottage in which George Stephenson was born is being pulled down, and in its place a handsome memorial school will be erected, which will at all times be allegorical of the great man who first saw the light in that humble spot. John Bull is, perhaps, not very "go ahead," but there is much for us to admire and copy in the way that he is now celebrating great events and marking historic spots, namely, by erecting school-houses, public fountains, and statues. How much better than fireworks, parades, and buncombe speeches!

Scientific American.

NEW YORK, OCTOBER 30, 1858.

Reminiscences of Sewing Machine Inventors.

We have often thought that reminiscences touching the mental operations and the rights and wrongs of inventors, if they could be brought under the graphic pen of a Charles Dickens, would form a most instructive and amusing volume. From an experience of more than thirteen years with the order of persons usually denominated "geniuses," many facts of an interesting nature suggest themselves to our minds. In the present instance, we venture to say a few words bearing only upon one class.

Elias Howe, Jr., of Cambridge, Mass., obtained a patent for the first practically useful sewing machine in 1846. For several years it was a source of annoyance and expense to him, with little or no pecuniary profit. Since that time many improvements have been patented, and the manufacturing of sewing machines is now one of the most extensive businesses in the United States, and thousands are sold annually. Elias Howe, Jr., once a poor inventor, with few friends, now receives, from the most prominent makers of sewing machines, a tribute that will make him, before the first term of his patent expires (1860), one of the wealthiest men in this country. We do not speak from any positive knowledge of the facts, but his present annual income cannot be calculated at less than $100,000; certain it is, that, in the course of a single month, he must have received from one establishment no less than $6,000, judging from the number of machines sold by that concern. On almost any pleasant day a portly man with flowing hair, white cravat, and broad-brimmed Kossuth hat, may be seen on Broadway, dashing along behind a splendid pair of fancy horses, fit for the stud of an emperor, and with all the ease and independence of a millionaire. That man is Elias Howe, Jr., once the poor and humble inventor. We rejoice in the good fortune of our old friend, and can only say to him that he is entitled to all that he has received.

In the year 1849, there came to our office a spare-looking humble man, hailing from Pittsfield, Mass. After taking a cursory survey of the modest premises which we then tenanted, and feeling a degree of security that he could trust to our integrity and honor, he carefully untied a handkerchief, and brought out two models—one a sewing machine, the other a rotary steam engine. He was a poor inventor, and had not the means to take patents for both of his darling projects; and upon our advice he gave us an order to proceed to secure his right on the sewing machine, which we accordingly did. Subsequently, his Letters Patent issued, and he unsuspectingly intrusted his affairs in the hands of unprincipled men, and he was cheated. Nothing daunted, he set his prolific genius at work, and as the result, A. B. Wilson soon produced an almost perfect sewing machine, which, under the good business management of Nathaniel Wheeler (we wish every inventor could secure such an efficient and honest co-operator) is now a triumph. Should any of our readers chance to visit the neat village of Watertown, Conn., they will find that the occupant of one of its most beautiful mansions is no less a personage than our once poor client with his cotton handkerchief full of inventions!

In the same year (1849), a young machinist, with a small capital but an honorable ambition, opened a small shop at No. 33 Gold street, within a stone's throw of our office. With a considerable stock of ingenuity, and the advantage of ready hands, he applied himself to render the sewing machine available to various arts, and did much towards this result; but, possibly acting under some prejudice that patents were humbugs, and inventors ditto, he did not secure his rights, as he should have done; and not until he saw his improvements subsequently taken advantage of by others, did he awake to the value and importance of securing his improvements to himself. He let the "liquid chance go by;" as it is only within twelve or eighteen months that A. Bartholf (who is now an extensive manufacturer of sewing machines at No. 489 Broadway) has placed himself in a position to reap a suitable reward for his genius and industry. If he had been anything else than a most persevering and industrious man, he would have been stranded high and dry by the other energetic pioneers in the race.

Had we time and space to enter upon this subject in more extended detail, we could furnish interesting items in the life of Isaac M. Singer, a veteran inventor and manufacturer of sewing machines; also of Grover & Baker, and others engaged in the same branch of manufacturing. Enough has been said to show what has been accomplished, in less than ten years, in the improvement of sewing machines. The same remarks will apply to other branches in which inventive talent has been employed and richly remunerated. During this time we have not been mere idle lookers-on. We have had a professional hand in this business, beginning as far back as the time when Howe (through the aid of a Mr. Thomas, who was then an extensive corset-maker in London) undertook to introduce his first humble sewing machine into England. The original drawings in this case were made by our Chief-Examiner; and since that time, hundreds of applications for patents on sewing machines have passed through the Scientific American Patent Agency.

"The Salt, if you Please."

Everybody has a partiality for dinner, and one of the most frequent expressions at a dinner table is the one which forms our caption, and in order that our readers may know something of the substance they are using, we will tell them a few facts about salt. Salt is a chemical compound of twenty-three parts by weight of a beautifully silver white but soft metal, called sodium, discovered by Sir H. Davy in 1807, and thirty-five parts of a pungent, yellowish green gas, called chlorine, discovered by Scheele in 1774—these two combined form this, the most widely diffused and useful of any one compound in the world. It is found in the sea, and in the rocks, from which our principal supply comes. The most wonderful deposits are in Poland and Hungary where it is quarried like a rock, one of the Polish mines having been worked since 1251. These Polish salt mines have heard the groan of many a poor captive, and have seen the last agonies of many a brave man, for until lately, they were worked entirely by the state prisoners of Austria, Russia or Poland, whichever happened to be in power at the time; and once the offender, or fancied hindrance to some other person's advancement, was let down into this subterranean prison, he never saw the light of day again. So salt has its history as well as science. Other large deposits are found in Cheshire, England, where the water is forced down by pipes into the salt, and is again pumped up as brine, which is evaporated and the salt obtained. To such an extent has this been carried that one town in the "salt country," as it is called, has scarcely an upright house in it, all the foundations having sunk with the gronnd, to fill up the cavity left by the extracted salt.

In Virginia there are beds of salt, and the Salmon Mountains, in Oregon, are capable of affording large quantities of the same material. The brine springs of Salina and Syracuse are well known, and from about forty gallons of their brine, one bushel of salt is obtained. There are also extensive salt springs in Ohio. The brine is pumped up from wells made in the rock, and into which it flows and runs into boilers. These boilers are larger iron kettles set in brickwork, and when fires are lighted under them, the brine is quickly evaporated. The moment the brine begins to boil, it becomes turbid, from the compounds of lime that it contains, and which are soluble in cold, but not in hot water; these first sediments are taken out with ladles called "bittern ladles," and the salt being next deposited from the brine is carried away to drain and dry. The remaining liquid contains a great quantity of magnesia in various forms, and gives it the name of "bittern" from the taste peculiar to magnesia in every form.

"But how did this salt come into the rock?" is the natural query, and the wonder seems greater when we recollect that salt-beds are found in nearly every one of the strata composing the earth's crust. This fact proves another, that as the majority of these salt-beds have come from lakes left in the hollows of the rocks by the recedence of the sea, the sea has through all the geologic ages been as salt as it is to-day. Let us take the Great Salt Lake as an illustration, it being the largest salt lake in the world, but by no means the only one, as such inland masses of saline water are found over the whole earth, but as ours is the greatest in extent, it will form the best example. It is situated at an elevation of 4,200 feet above the sea, on the Rocky Mountains, and has an area of 2,000 square miles; yet, high as it is, "once upon a time," as the story-books of our juvenality used to say, it was part of the sea, which retired, by the upheaval of the rocks, and that great basin took its salt water up with it. Should this in time evaporate, and its salt become covered with mud and sand, and the land again be depressed; then, at some distant future age, the people would be wondering how the salt got there, little thinking that the Mormons had ever built a city on its shores when it was a great salt lake. There are also, however, salt rocks taking their place in regular geologic series with other rocks, interspersed between red sandstone, magnesian and carboniferous strata; these we can only account for, as we do for other stratified rocks, viz., that they were deposited from their solution in water or carried mechanically to the spot where now found by that ever mobile liquid. We fear we should be accused of an attempt to put our readers in pickle, so will stay our pen, hoping they will remember these bits of information when next they say, "The salt, if you please."

American Steel.

Although we possess inexhaustible stores of the best iron ores for making all kinds of steel, yet very little of this useful metal is manufactured in our country in comparison with the amount imported from abroad. We import annually about 13,000 tuns of steel, valued at $2,300,000, and the best qualities come from England. We learn from the recently published work of B. F. French on the American iron manufacture, that about 6,000 tuns of steel are produced annually in Pennsylvania, but it is of such an inferior quality as not to interfere with the trade in English steel.

The iron from which the best steel in Sheffield is made, is the product of Swedish magnetic ores, of which England is deficient, while similar ores are very abundant in various parts of the United States. It is not much to our credit, therefore, that while we have the natural resources to make the best brands of steel, we are dependent for our supply of this metal upon a country which has not the good fortune to contain such natural resources. Various unsuccessful attempts had been made to manufacture American cast steel, but we learn from the work referred to, that Neville's process is now practised in our country somewhat successfully, although on a limited scale. Its nature consists in fusing wrought iron with certain substances containing cyanogen. About twenty pounds of malleable iron broken into small pieces, are put into a crucible, with ten ounces of charcoal, six of common table salt, or $\frac{1}{2}$ oz. oxyd of manganese, one ounce of salammoniac, and half an ounce of the ferro-cyanide of potash. These being mixed together, the crucible containing them is introduced into the furnace, its contents thoroughly melted, the scum skimmed off, and the melting heat maintained for three hours, when the metal is ready to be poured out into ingot molds. This process, it is stated, makes good cast steel, either for hammering or rolling. Good cast steel may also be made from scrap iron, by smelting it in crucibles, with three ounces of the oxyd of manganese, ten of charcoal dust, and one of lime, to thirty pounds of the iron. The operation of smelting requires about three hours, during which the scoria is carefully skimmed from the top of the crucible. This is the basis of what is called "Heath's process," which has been practised for many years in England.

It would be a most important improvement were good steel to be made from our cast iron, because it would save several expensive common processes through which iron passes in order to be converted into steel. To obtain such a result in a profitable manner, so as to carry out the manufacture on an extensive scale in our country, we invite particular attention. We advise no doubtful project; for the manufacture of cast steel from cast iron, we believe, is now successfully practised in England.

In a paper recently read before the Institution of Mechanical Engineers, by T. Spencer, of Newcastle, he described the Uchatius process for this purpose, and claimed very high results from it. The cast iron is first run in a molten state from a cupola furnace, and allowed to drop in thin streams in a tub containing cold water. This operation reduces it to a granulated state, having a very extensive surface to adapt it for decarbonization. After this it is placed in crucibles of any requisite size, and about twenty per cent of calcined ground hematite, or oxyd of iron, and five per cent of soda or of caustic lime added. The crucibles are then introduced into the furnace, and their contents gradually brought up to the melting point, and the heat increased towards the end of the operation, which lasts about three hours. During this period the scoria is frequently skimmed from the surface, and the molten metal when ready, is poured into ingot molds. Good cast steel is made from cast iron, so it is positively asserted, by this process; and it is also stated that a bar of it one inch square, the same price as a bar of iron of the same dimensions, is three times stronger. As cast iron contains too much carbon and other impurities, these have to be removed in converting it into cast steel. The oxyd of iron mixed with the granulated cast metal, presents sufficient oxygen to the excess of carbon to convert it into carbonic acid, which escapes; the lime or other alkali acts as a purifying flux to remove silica and sulphur, which arise on the surface of the crucibles as slag. If we could substitute a cheap cast steel for wrought iron in making boilers, and a thousand other bulky objects requiring great strength, the advantageous results arising therefrom would surpass all calculation.

This is a subject to which our people should direct their attention. It is a duty which they owe to themselves and their country. Instead of being dependent on other countries for our steel, as we now are, we ought to be supplying England, France, and Germany with it, just as we supply them with cotton and wheat. Great efforts should be made to bring about such a result, because we are now furnished with steel from a source which appears to be as natural for our country as to find water running up a hill.

The German Scientific Congress is now holding its thirty-seventh session at Carlsruhe. There are 1,100 members present, from all parts of the world.

Iron Girders.—No. 1.

MESSRS. EDITORS—Considering the importance and peculiar fitness of iron in architectural and bridge construction, it is to be regretted that writers on this subject have not made the manner and forms of its use more plain; as there is no doubt but its application might be made far more simple, and its use more extensive and economical than in the manner and forms in which it is now generally employed.

The greatest obstacle in the way of a more extensive use of iron for such purposes, arises from the mystified, and in some respects, conflicting conjectures and theories of *learned* writers on this subject. The writings of these men afford evidences that their authors do not clearly understand the questions they have treated, and they have confused practical men who have consulted them for scientific information. All which they have produced which is really valuable has been the result of experiment rather than calculation. They were astonished at the perfectly natural results which were developed by experiments with pressures on elliptical, cylindrical, and and rectangular tubes, thus showing that they had not a correct understanding of the subject, or comprehension of the whole question. For example, the projectors of the Brittania Bridge—after numerous experiments, and after combining what they had thus learned with their formulæ—in devising a model of seventy-five feet span to represent a section of that bridge, and making this model as perfect as they knew how, it proved on trial so defective that by adding gradually about one-fifth to its weight, as its defects became apparent, under tests, they were enabled to raise its capacity of strength from thirty-five and one-half tuns to eighty-six and one-tenth tuns.

Now, in their very poor success in this instance in devising a right form and proportions based on *calculations*, there is no evidence of want of knowledge of the capacity of iron to bear direct strains—they seem to have been well informed in this respect. But the fact that they tried elliptical and cylindrical tubes at all for such purposes, and that they finally adopted rectangular tubes of nearly uniform cross section, shows that they did not understand the direction in which the forces act in such structures, and consequently they were not able to determine the direction nor intensity of the mechanical strains at different points. Had they understood the normal direction of the forces and of the resulting strains, they would have adopted very different, and much better forms, and their reports on this not very complicated question might have been more simple, and better adapted to the capacity of plain practical men.

That they did not adopt the best forms, nor the best modes of construction, will appear more plainly by comparing their results with others obtained by testing a different form and mode of construction, differing from the rectangular girder in nearly every feature and principle. The results obtained from testing one of the latter were reported in the April number of the "Journal of the Franklin Institute," in 1854. This was a girder 34½ feet long, made to span 33 feet; its weight was 3,450 pounds, equal to 100 pounds to the lineal foot. It bore a load of 104,000 pounds uniformly distributed (equal to 52,000 pounds on the middle), without sustaining any injury to its strength. Its deflection under this load was 1 5-16 inches, and when the load was removed, the girder resumed its original form; there was no "set" in the deflection. These girders have been made of various lengths and capacity, for various purposes, and all seem to answer equally well. These are termed "compound girders," and are formed and constructed in almost total disregard of the theories and rules laid down by the writers and experimentalists alluded to, and which are generally adopted in our country by those who take Fairbairn as their guide. The form and construction of the latter were wholly based on *calculation*, not on experiments. Experiments have since been tried, but these have only proved the correctness of the calculations, without suggesting any change by which their value can be enhanced. A careful comparison of these results with the results of tests in England, and with those made at Washington on rectangular tubes and solid rolled beams and girders, shows the compound girder to be superior in value by at least *one-third in weight of material*, besides being so much more simple and economical in construction, that the compound can be afforded at *two-sevenths less per pound* than the rectangular girders. This is certainly a very great difference; but it is confidently believed that any one who will take the trouble of a careful comparison of the facts and data which are open to all, must come to very nearly the same conclusions.

The views published by the makers of most of the beams and girders used by our government, sustain these conclusions fully. One of their girders of the same length and capacity of the compound girder of 34½ feet referred to, will weigh about 137 pounds to the lineal foot, whereas the weight of the compound girder was only 100 pounds to the foot, a difference of more than one-third *in weight*, besides, as before stated, its cost per pound is 2-7 less, making the actual difference equal to about one-half of the entire cost, and at the same time it possesses several important practical advantages over the others.

BENJAMIN SEVERSON.

Baltimore, Md., October, 1858.

Materials for Paper.

When reading and writing became common, and paper was demanded in such large quantities, the consequent increased intelligence of the people taught them more and more the value of economy, and it was feared that in time rags would become so scarce that the price of paper would rise enormously. This actually happened three years ago, and the price of paper rose from two to three cents a pound all over the world. The London *Times* offered a very large premium for any substitute which will make the same quality of paper at a less price; this set fresh men at work, and stimulated those who were already in the field of discovery, and this newspaper is now printed on paper made from cotton and beet residue, but we are not aware that they have been so fully satisfied as to pay the premium. Dr. Collyer, of London, discovered that the refuse of the beet sugar manufactories mixed with cotton could be made into excellent paper; and we believe that the general impression is that paper has been made from the refuse alone. There is an abundance of this material in Europe.

In France, Belgium, and Germany there are 3,000 beet sugar manufactories, which give an annual refuse of 300,000 tuns, and there is about 100,000 more to be obtained from the refuse of distilleries, so that the supply may be regarded for the present as almost illimitable. Very little change is required in the machinery for manufacturing paper from it, and it obviates the use of size. It is said to contain about 56 per cent of fiber, 30 parts of albumen and cellulose, and 10 parts of fixed salts. We are inclined to think, however, that in estimating the saving which the introduction of beet residue will cause, some important considerations have been omitted by the discoverer and his friends. In our opinion, from an examination of the residue, and the paper manufactured from it and cotton mixed, the fiber of the beet plays but a very small part, and it is the mucilage which does the business. We have not seen any paper made of beet residue *alone*; the samples which have come under our notice all containing more or less cotton, and in proportion to the amount of cotton is the superior quality of the paper. The beet residue, therefore, seems to us to play the part of a mucilaginous medium, instead of an aqueous one, the tendency of which is to bind the cotton fibers better together, to produce a sizing and face, and save material, by preventing the escape of the small and finer cotton fibers from the pulp, and by filling up the interstices between the fibers; but the amount of fiber which it contributes, we are convinced, is small. It is, for all this, a great discovery, and produces an excellent paper, which can be printed *dry*; and by varying the proportions of beet and cotton, any quality of paper can be obtained. The printing paper for newspapers is made from equal quantities of each, is worth about thirteen cents per pound in this market. Mr. Winchester, of 211 Center street, this city, is introducing it into this country.

Another material that we wish to notice is *reeds*. We have seen some most excellent wrapping paper made from Carolinian reeds by a manufacturer in the neighborhood of this city. It was strong, and when unbleached had a pleasant brown color. The experiments are not yet concluded, and we have many doubts whether any fine paper can be made from them; but if a good wrapping paper and the coarser varieties can be made, it will leave a quantity of rags to be better employed; and therefore we wish success to the experimenter. We are not by any means sanguine, however, respecting the ultimatum of any of the new materials which are proposed for paper-making; but as cotton and hemp can be cheaply cultivated, the proper method of cheapening paper will be to pay attention to the cultivation of cotton, and spread its geographical distribution, so that the raw material will cost so little that it can be used directly to make pulp without having to be passed through other manufacturing processes, as well as in a manufactured state. This seems to us to be the idea which should be propagated, as it would not only reduce the price of the best material known, but would also save the labor and expense of reducing the rags, washing and bleaching, and simplify the process of paper-making by about one-third.

Since writing the above we have received a very interesting letter from a correspondent on this subject, which we shall publish in our next number.

Some of the Wonders of Chess-Playing.

The Paris correspondent of the London *Times* gives an interesting account of the astounding performances of young Paul Morphy, which have brought the excitement of the chess-playing world to a white heat. Not long since he played against and beat, blind-folded, eight of the best players of Paris at one time! The Café de la Regence, at which this extraordinary feat occured, has two large rooms on the ground floor. In the first room, which is full of marble tables, were seated the eight adversaries of Mr. Morphy. In the second room, in which are two billiard tables, was seated the single player. A large portion of this room, including the billiard tables, was shut off from the crowd by a cord, and behind the tables, in a large arm-chair, sat Mr. Morphy, with his back directly to the crowd. Two gentlemen, reporting for the press, kept the game, and two other gentlemen, Messrs. Tournoud and Arnoud de Riviere, cried out the moves, or rather carried them from one room to the other. The adversaries of Mr. Morphy were Messrs. Baucher, Bierwith, Barnemann, Lequesne, (the distinguished sculptor,) Potier, Preti, and Seguin. They were all either old or middle-aged men, and superior players, while Mr. Morphy is but twenty-one years of age. The boards of the eight players were numbered 1, 2, 3, &c., in the order in which I have named the gentlemen. At 12½ o'clock the games commenced, Mr. Morphy playing first, calling out the same moves for all the eight boards. K P2. (The games were conducted in French, Mr. Morphy speaking French perfectly.) At 7 o'clock, No. 7 was beaten with an unlooked for check-mate. Soon after 8 o'clock, No. 6 abandoned the game as hopeless, and half an hour later M. Lequesne, No. 5 played for and gained a draw game. Nos. 1, 2 and 3 were soon after beaten. At 10 o'clock, No. 4 made the blind player accept a draw game, but it was 10½ o'clock before M. Seguin (No. 8) a very old gentleman, who contended with great desperation, was beaten. Thus he beat six, while two who acted on the defensive and only sought a draw game, effected their purpose, but a draw game, under such circumstances, ought to be considered equivalent to a beat.

During the entire game, which lasted just ten hours, Mr. Morphy sat with his knees and eyes against the bare wall, never once rising or looking towards the audience, nor even taking a glass of drink or other refreshment. His only movements were those of crossing his legs from side to side, and occasionally thumping a tune with his fingers on the arms of the *fauteuil*. He cried out his moves without turning his head. Against 1, 2, 3, and 6 and 7, who were not up to the standard of the other three players, he frequently made his moves instantaneously after receiving theirs. He was calm throughout, and never made a mistake, nor did he call a move twice. It must be recollected, moreover, that Morphy played "against the field"—in other words, that around each of the eight boards there was a large collection of excellent chess-players, who gave their advice freely, and who had eight times longer to study their play in than the single player. He played certainly against fifty men, and they never ceased for a moment making supposed moves and studying their game most thoroughly during the long intervals that necessarily fell to each board. And yet Morphy, who was out of sight of these eight boards, saw the game plainer on each than those who surrounded them! I could scarcely have believed the thing possible if I had not seen it. At the end of the game there was a shout from the three hundred throats present, which made one believe he was back again in old Tammany Hall! The fact is, there was a considerable number of Englishmen and Americans present (among the latter was Prof. Morse, who took deep interest in this extraordinary game), but much the larger number were French. Morphy did not seem at all fatigued, and appeared so modest that the frenzy and admiration of the French knew no bounds. He was shaken by the hand and complimeted till he hung down his head in confusion. One grey-haired old man, an octogenarian chess-player, stroked his hair with his hands, as he would a child of his own, and showered him with terms of endearment. Morphy has no beard yet, and looks more like a schoolboy than a world's champion. He escaped from the excited crowd as soon as possible, and left, with some friends, to get something to eat. It is not necessary to point out to chess-players the immensity of the intellectual feat; every one will admit that it borders upon the miraculous, and as was remarked by one of his antagonists, M. Lequesne, such a mind never did exist, and, perhaps, never will again.

An Elevated Railroad.

In Chili, a branch of the Copiapo Railroad, between Pabellon and Chanarcille, passes over the Atacama Mountains at an elevation higher than any other railroad in the world. On the 3d of August, part of this railroad was opened, and a locomotive ascended to the terminus, at an elevation of 4,440 feet above the level of the sea. This altitude is about 1,000 feet greater than the highest point of the Vienna and Trieste Railroad in the Austrian Alps. The highest elevation on the railroad which passes through the Blue Ridge in Virginia is 2,700 feet, one thousand seven hundred and forty feet less than the highest point on the Copiapo Railroad.

A cotemporary states that glycerine is employed to moisten yellow sugar, in order to increase its weight and deceive purchasers. This method of cheating customers would have the very opposite tendency in this city, where glycerine is much dearer, by the weight, than sugar.

Notes & Queries

*** Persons who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

G. W. C, of N. Y.—You are mistaken in supposing that a double velocity requires only double the power —it requires four times the power. This will enlighten your mind upon the increase of centrifugal force according to the square. Centrifugal force is simply inertia.

B., of Mo.—All the suggestions which you have presented in regard to the Atlantic Cable have already been brought under our consideration. Spiral conductors are not required. The conductor should be strong and straight. Horizontal delivery reels would be superior to vertical coils, as kinks in the cable would thus be avoided.

S. W., of Iowa.—You can procure a good device for sustaining window sashes without weights and pulleys, of H. B. Horton, Akron, Ohio,

J. W. Hoffman, of Claverack, N. Y., wishes to correspond with a manufacturer of chisel-handle ferrules.

Housewife.—You can clean marble in the following manner:—Take two parts of common soda, one part of pumice stone, and one part of finely powdered chalk; sift it through a fine sieve, and mix it with water; then rub it well all over the marble, and the stains will be removed; then wash the marble over with soap and water, and it will be as clean as it was at first. Cockroaches are certainly very annoying, and it is not easy to get entirely rid of them. We have seen the following recommended to kill them, which is certainly safe and easily tried:—A teacupful of ground plaster of Paris, mixed with double the quantity of oatmeal, to which add a little sugar. Strew it on the floor, or in the chinks where they frequent.

A. B. W., of Mich.—Your method of making bank notes, by inserting the denomination of the bill in colored silk thread between two thin sheets of paper, which could be joined while wet in the paper mill, is old, and has been used for British post-office envelopes for many years. Besides, it is of no use, as the counterfeiters could make exactly the same kind of paper.

Artificial Jewels.—One of the most curious sights in Paris is afforded by a visit to the vast workshop of M. Bourguignon, where the whole process of transforming a few grains of dirty, heavy looking sand into a diamond of the purest water, is daily going on, with the avowed purpose of deceiving everybody but the buyer. The coloring matter also for imitating emeralds, rubies, and sapphires, is entirely mineral, and has been brought to high perfection by M. Bourguignon. Many operators are employed, whose business it is to polish the colored stones, and line the false pearls with fish scales and wax; the scales of the roach and dace are chiefly employed for this purpose. They must be stripped from the fish while living, or the glistening hue so much admired in the real pearl cannot be imitated.

E. H. L., of Mass.—A man may conceive a good improvement in a machine, but if he neglects to carry it out into practice, another may secure a patent for such an improvement, and the one who first conceived it will have no right to its use. Inventors should never procrastinate in reducing their ideas to a practical form, and applying for patents as soon as possible.

C. W. K., of Minn.—You can make scythe raffles and razor strops with fine emery mixed with a solution of glue. It is put on to the strop with a brush, and allowed to dry.

Noncombustible Clothing.—Ladies may render their gauzy dresses somewhat incombustible by mixing a little pulverized alum in the starch when they are "done up." The alum will render the dress far stiffer, as well as less liable to ignite on coming in contact with fire. It may also be used in "doing up" curtains, although the increased stiffness will render the fabric more likely to crack.

A. B., of N. Y.—School furniture can be procured of Charles Perley, No. 114 Columbia street, this city. The seats are fitted to columns, and are swung around upon them, so as to give room for the evolutions of the school in any direction. The desks are fitted to the top of these columns, the whole making a convenient arrangement.

A Patentee may surrender his patent at any time during its existence, i. e., within the fourteen years after it is first granted, and obtain a re-issue covering such portions as were shown in his model, and which he omitted by mistake to cover in his original patent.

R. C. L., of Mo.—We do not know where a machine for making sieve hoops, and putting together the different parts of sieves, can be obtained.

One of the Peninsular and Oriental Company's steamships, the *Pera*, left Southampton on July 4th, and returned on the 31st, having accomplished 6,000 miles and five stoppages in twenty-seven days. She ran from Southampton to Gibraltar, 1,000 miles, in three days and twenty-one hours; thence to Malta, another 1,000 miles, in two days and nineteen hours. Thus she ran a distance of 2,000 miles in seven days and sixteen hours. Rather good steaming that.

C. C., of Pa.—We answer all questions of a practical character in mechanics, chemistry, mathematics, and the arts. We make no charge whatever for answering inquiries.

N. B. La F., of Del.—The art of staining and imitating stained glass is intricate, and there are but few who are acquainted with it. W. Gibson, of this city, has the largest establishment in the country. You had better communicate with him on the subject. Ground glass can be partially imitated by a composition of oil and Paris white, applied with a brush.

Large Incomes in England.—There are forty-six persons in England who have incomes of £450,000 a year, equal to two millions and a quarter dollars, while four hundred and forty-four persons have incomes ranging from fifty to two hundred and fifty thousand dollars a year, and eight hundred and eleven from twenty-five to fifty thousand. In Ireland there is but one person who has an income of upwards of two hundred and fifty thousand dollars; twenty-one have incomes from fifty thousand to two hundred and fifty thousand, and thirty from twenty-five to fifty thousand dollars.

J. I. C., of Ga.—We thank you for your warm approval of our labors and for your zeal in advancing our interests in your prosperous State.

W. F., of Va.—You can obtain in this market what is known as "terned tin plate" for roofing purposes at $8 50 per box; bright tin, $9 25, cash. It can be had of Phelps, Dodge & Co.

J. G., of N. Y.—H. C. Baird, of Philadelphia, has published a work on the rectifying of liquors. Price one dollar.

C. P. G., of Mass.—Picric acid is made by adding finely pulverized indigo, cautiously, to hot nitric acid, It forms in beautiful yellow crystals; you can obtain it at the druggists. Modeling clay is composed of silica and alumina; it is found in various localities. Potter's clay answers very well for modeling. It is just as easy to work a short as a long screwdriver, provided the point of each is of the same breadth, and each handle the same thickness.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, October 23, 1858:—

P. & B., of N. Y., $25; H. E. F., of Ill., $25; H. M. of Pa., $25; F. & M., of Mass., $25; N. A., of Mass., $100; W. S. W., of L. I., $20; W. M. B., of Ind., $30; H. K., of R. I., $25; E. M., of N. Y., $30, A. B. & G., of Pa., $250; S. D. S., of Me., $25; G. W. F., of Mass., $40; J. B. D., of N. Y., $50; W. G., of Mass., $30. J. W. S., of Ohio, $55; J. H. T., of N. Y., $150; W. H. B., of N. Y., $25; J. B. A., of N. Y., $30; K. & P., of Conn., $250; W. & R., of Iowa, $30; J. P. Van V., of Wis., $25; T. S., of Pa., $250; F. & B., of Wis., $25; J. G., of Ill., $30; J. O., of Ill., $25; T. H. K., of Ga., $25; W. L. S., of Cal., $30; L. B., of Ala., $30; I. H. T., of Conn., $35; J. E. A., of Conn., $30; S. P. M., of Mo., $35, W. H. B., of Ala., $25; C. A. E., of Ga., $30; J. H, S., of Conn., $25; J. M., of Ohio, $30; P. W. G., of Ill., $20; M. & P., of Ind., $30 - A. L., of N. Y., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, October 23, 1858:—

H. M., of Pa.; P. B., of N, Y.; P. B., of Conn.; H. K., of R. I.; J. E. B., of Conn.; J. H. S., of Conn.; W. & J., of Ill.; F. & B., of Wis.: J. O., of Ill.; J. O., of Pa., T. H. K., of Ga.; W. H. B., of N. Y.; W. H. B., of Ala.; J. R., of N. Y.; J. D. S., of Me.; F. & M., of Mass.; J. P., of Tenn.; A. L., of N. Y.; J. M., of Miss.; H. E. F., of Ill.: J. B. D., of N. Y., two cases; J. L. F., of Texas, two cases; J. P. Van V., of Wis.; G. F. & C., of Ill.: J. M., of Ohio; H. B. A., of N. Y. P. K., of Ill.; C. S. P., of Conn.

A WORD TO OUR PATRONS.

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

Back Numbers.—It has been our custom in years past to send the back numbers of our paper to all who subscribe during the first quarter of the volume. This system has given satisfaction heretofore, and we shall continue it on this volume, unless the party subscribing orders to the contrary when he remits. Those who do no not care for the back numbers, to render their volumes complete, can have their subscriptions commence at the time of remitting by signifying such a desire.

TERMS OF ADVERTISING.

Twenty-five cents per 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.

Shooting Stars.—Meteors.

Various brilliant bodies have been frequently observed shooting through the heavens with a terrible velocity, creating alarm in the minds of the ignorant, and exciting the wonder of the learned as to their mysterious origin. The midnight traveler, far from the abodes of men, is sometimes startled with one of these bright lights fleeting for an instant athwart their horizon, then as suddenly disappearing, leaving the darkness yet more profound. These meteors, as they are called, are far from being uncommon, or confined to any locality—they are seen in every part of our globe. Under the name of "shooting stars" they are witnessed in clear evenings during every month of the year, but in this latitude they are more numerous during the month of August. They have the appearance of celestial rockets rushing along (as has been measured) at the awful velocity of 59,400 miles per hour. They are strange messengers of the skies, and no satisfactory theory has yet been propounded respecting their nature and source.

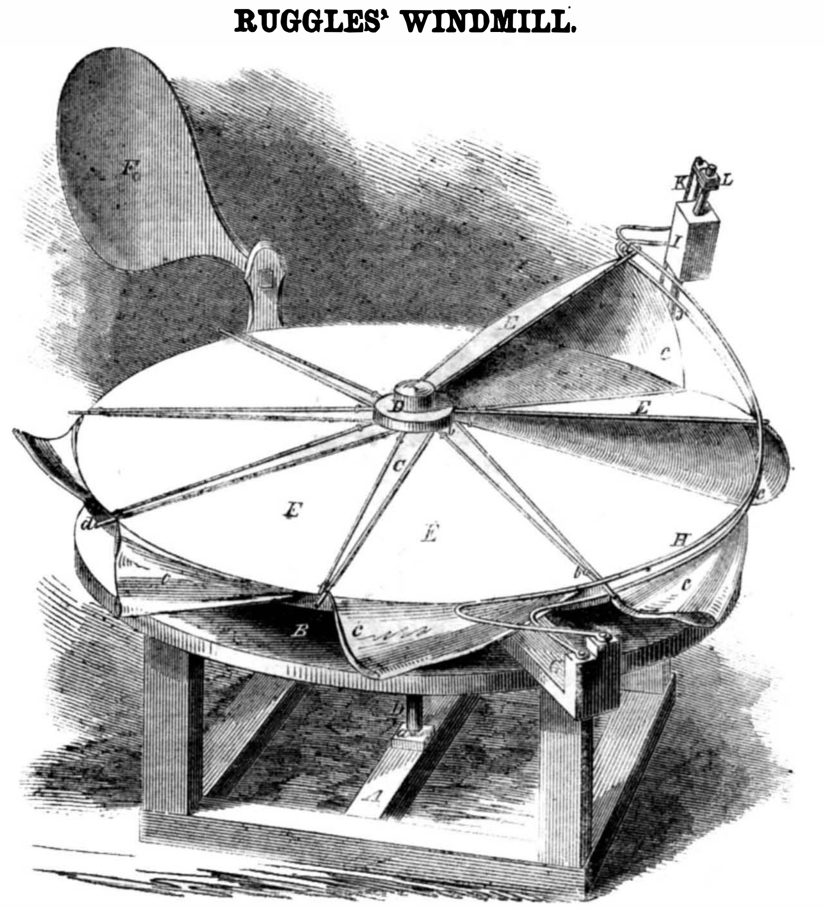
There are other meteors of a very different character from the shooting stars, which have the appearance of being incandescent solid bodies of various colors rushing with a less, but still a great velocity, through our atmosphere. Some of these are of considerable magnitude, and in their passage leave a long trail of light behind; a few have been observed to burst into pieces, with a loud report, and then disappear. Men of scientific attainments do not agree regarding their origin, but quite a number entertain the opinion that they have been projected from the volcanoes of the moon. In various parts of the globe what are called "meteoric stones" have been found. These are so different in their composition from any other stones found on the surface of the earth, that it is not difficult to conclude they may have been shot from some celestial cannon, like the craters of the moon. This was the opinion of La Place, and is now entertained by our countryman, Prof. J. Lawrence Smith, of Louisville, Ky. He has analyzed several of these meteoric stones, obtained from different localities, and they appear to be of the same composition, thus pointing to a common origin. In nature, form, and appearance they are foreigners to the stones and rocks among which they have been found; they are mostly composed of nickeliferous iron, with a very thin oxyd on the surface. Their component parts are, iron, 82·39; nickel, 15·02; cobalt, ·43; copper, ·09; phosphorus, ·16; silica, ·46; sulphur, ·08; magnesia, ·24; chlorine, ·02. Some of the nickel and iron were combined with the phosphorus, forming schrubersite. One of these meteor stones, found at Knoxville, Tenn., was so hard that it was difficult to cut with a fine saw, and it was very white in appearance, owing to the presence of so much nickel. It is supposed that these were projected during some great eruption in the moon, and being driven far beyond the sphere of our satellites' attraction, may have been revolving in paths of their own for thousands of years, until drawn within the influence of the earth, there at last to find a resting place. This is mere theory, to be sure; but to Dr. Smith, who believes in it, he can enjoy a quiet chuckle at having pounded a part of old Luna in his mortar, and dissolved a fragment of her body in his alembic. This theory is the most plausible of any yet presented, but the subject deserves further investigation.

In olden times, the ignorant peasantry regarded meteors as a sign of death to conspicuous persons, such as chiefs and kings; but now they are beheld without such feelings, but not without wonder. Their mysterious origin imparts to their appearance a deep and impressive interest.

Philadelphia Steam Fire Engine.

A very neat and compact steam fire engine belonging to Hope Hose Company of Philadelphia, was exhibited at the Merchants' Exchange, this city, on the afternoon of the 19th inst. It has a tubular upright boiler, steam cylinders of 8-inch bore and 12-inch stroke, and pumps of the same length of stroke but only 5-inch bore. From the time of kindling the fire until an inch and a half stream was thrown 120 feet high, only 12 minutes elapsed. As the real efficiency of such fire extinguishers depends principally upon the lightness of the boiler and its capacity to raise steam, this engine appeared to meet these conditions fully. It is owned by the members of the Hope Company, a fine body of spirited young men who deserve great credit for their enterprise. They have taught our New York firemen a very useful lesson, and we understand that a large volunteer company is about to be formed for the purchase of such an engine, our citizens being determined not to be outdone.

RUGGLES' WINDMILL.

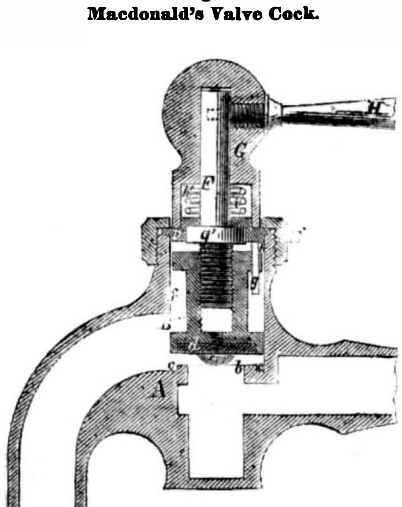


Even in the primitive ages of the world the force of the wind was applied as a motive power, and for thousands of years the inventive genius of man has been employed to discover how best to employ this costless power. One of the latest—the invention of S. W. Ruggles, of Fitchburg, Mass.—is the subject of the accompanying illustration, and its great merits are that it "holds" the wind so long as it can give out any power, offers little resistance, and can be placed on the roof of any building.

A is a frame on which is a table, B, that may represent a roof, and above this is a low circular conical piece, C, which has a central shaft, D, passed through its center that to support it, is stepped into a bearing, *a*, in the framing of the roof or other convenient spot. Attached to this cone, C, by hinges or links, *b*, are a number of triangular frames, E, of canvas and wire, having their ends formed also of canvas, *c*, properly cut, so that when E is lifted up it forms a perfect bag to hold the wind. The ends of the wires or rods, *d*, project beyond the periphery of the cone, and pass between the inclined guides, H, the lower ends of which are attached to a piece, G, on the other end of which is placed the steering fan, F, that keeps the guides, H, always in such position that the buckets, E, will always be opened in the proper direction to receive the full force of the wind. The upper ends of the guides are secured in a block, I, that slides up and down a rod, L, and is operated from the inside of the mill by the cord, K, in order that the incline may be made more or less, to get exactly that amount of power by opening the buckets more or less, according to the velocity of the wind, which is best to do the required work. As the wind fills the buckets, it rotates the wheel, and keeps it continually bringing the buckets to the guides by which they are opened, and when out of the plane in which the force of the wind is effective, they drop down and offer little or no resistance. When it is not required that the mill should be worked, the block, I, can be lowered to the level of G, and the projections, *d*, pass through them without elevating and opening the buckets.

This excellent wind-wheel was patented by the inventor, Dec. 16, 1856, and from him any further particulars can be obtained.

Macdonald's Valve Cock.



The object of this invention is to dispense with the use of packing around the stem of the valve, and still have the cock perfectly steam and water-tight, equally so as if packing were used and applied in the best possible manner around the stem. Our engraving is a section of one of these cocks, which we will now describe.

A represents the body of the cock, which is of the usual form, *b* is the valve seat, surrounded by a rebate, *c*, so as to give it an elevated position. B is the valve, the lower end of which is faced with a rubber, leather, or metallic disk, *d*, secured by a screw, *e*, and capable of bearing on the seat, *b*, when the valve is closed. The valve, B, works vertically in its socket, *f*, and is retained in a perfectly vertical position by a pendant guide, *g*, which fits in a recess or notch, *h*, in the side of the valve, this guide being attached to a cap, D, which is fitted by grinding snugly into the top of the socket, *f*, and is secured therein by a screw cap, E, which is screwed over the top of the socket, *f*. F is the valve stem, the lower part of which has a screw thread formed on it, which works in a female screw in the valve, B. The stem, F, is provided with a collar, *g'*, which is snugly ground into the under side of the cap, D. The stem, F, extends up through the cap, D, and passes into a head, G, in the lower part of which a chamber, *h'*, is formed, to receive a spring, *i*, which is placed on or around the stem, the lower end of the spring bearing on the cap, D, and the upper end bearing against the head, G. H is the handle, which is screwed laterally into the head, G, the end of the handle fitting into the upper part of the stem.

From the above description it will be seen that the valve stem, F, is kept in proper position in the head, G, by the end of the handle, H, and that all the working parts are kept together and secured in proper place by the screw cap, E; the spring, *i*, keeps the collar, *g'*, snugly in the cap, D.

By this invention the valve stem is kept perfectly steam and water-tight. The trouble, therefore, attending the packing of the stem is avoided, it being always in proper working order; and the difficulty occasioned by the bursting of the packing cap in frosty weather, when the invention is used as a water cock, is also avoided.

It is the invention of J. C. Macdonald, and was patented by him September 14th, 1858. Messrs. Gibson & Macdonald, of No. 200 Vine street, Cincinnati, Ohio, will be happy to furnish any further information.