

VIBRATING WATERFALLS.

There are a number of dams which produce vibrations that are very sensibly felt in their immediate vicinities. The cause of these phenomena has been a subject of much discussion upon several occasions. No person in our country, we believe, has devoted more attention to them than Mr. Elias Loomis, Professor of Natural Philosophy and Astronomy in Yale College; and as he is a very careful, persevering, and cautious experimenter, and most candid in what he gives to the public, his opinions deserve great consideration. The *American Journal of Science and Arts* for this month contains an article by Prof. Loomis, detailing his observations and those of other parties on three vibrating waterfalls, in South Natick, Holyoke, and Lawrence, Mass. In 1843, Professor Loomis published an article on this same subject, in which he suggested that the dam itself was the vibrating body and that the vibrations were analogous to those of a stretched cord. The attention of Professor Snell being directed to the subject, he took a different view of the causes of the vibrations, and attributed them to a column of air behind the sheet of water. After an extended series of observations, Professor Loomis has altered his first views, and has come to conclusions similar to those of Professor Snell.

A series of careful observations were made last year by Mr. William Edwards, at the request of Professor Loomis, on the vibrations of the dam at South Natick, Mass. These resulted in ascertaining that the time of a vibration, according to the depth of water on the edge of the dam, was a little less than the time in which a solid body would fall through a space equal to the depth of the water. Thus when the depth of water was 5.06 inches, the time of one vibration was 0.138 of a second, while the time of a solid body falling through that depth was 0.162 of a second.

The dam across the Connecticut river at Holyoke, Mass., is 1017 feet long and 30 feet high. It is formed of square timbers inclined 22 degrees to the horizon. From the crest of the dam the water descends along an apron about 4 feet in length, sloping downward at an angle of 22 degrees. The vibrations on this dam disappear when the depth of water is less than 12 inches, and also when the depth is as great as 80 inches. At Lawrence, Mass., Mr. B. Coolidge, engineer, made a series of observations, as also did Prof. Loomis. In all these, the time of the vibrations was taken, and compared with the time which a solid body would occupy in falling from the same height; and the number of vibrations of a column of air of the depth behind the sheet of falling water has been calculated. Now as to the conclusions; Prof. Loomis says "it seems probable that the vibrating motion originates in a column of air behind the sheet of water, and that the descending sheet serves merely as a load to retard the velocity of these vibrations." When the edge of the dam is uneven, and when the sheet of water is very thin, an opening will be left for the column of air behind the sheet, and no vibrations are produced. When the sheet of water is very thick, it partakes somewhat of the rigidity of a solid body, and is not acted upon by the column of air behind it with sufficient power to cause vibrations. This theory accords with the views presented on pages 110 and 126, Vol. XIII (old series) *SCIENTIFIC AMERICAN*, by several correspondents in different parts of the country, who had made observations on vibrating dams. Prof. Loomis says, in reference to the form of vibrating dams:—"It is believed that most waterfalls exhibit some degree of vibratory motion at certain stages of water; but in order that these vibrations may be powerful and long-continued, the edge of the dam must be horizontal and quite smooth, otherwise the thickness of the sheet will not be uniform. The sheet will divide in some places before reaching the bottom of the fall, and this leaves an opening in the enclosure which contains the column of vibrating air." According to these views, all dams may be built so as to avoid jarring vibrations.

At a factory in Portland, Maine, nearly 1,000 bushels of potatoes are "concentrated" for the army every day. All the water is absorbed, leaving about five pounds of nutriment to the sixty pounds which a bushel of potatoes averages, and that concentration is ground up, giving it the appearance of Indian meal.

AMERICAN STEAMSHIPS FOR CHINA.

Sometime ago we gave in a brief paragraph an announcement that Mr. John Englis of this city was building two small screw steamers for the China trade. These vessels are now launched and nearly ready to proceed to their destination. They are intended, one for towing in the harbor of Shanghai, the other for outside service and on the Yangtze river. As a large number of American steamers are now in Chinese waters, the most of which have been recorded in the *SCIENTIFIC AMERICAN*, it is not improper to add these latest specimens of our engineering and ship-building skill to the list.

The longest of the two vessels is called the *Vulcan*, and is 130 feet long, 24 feet beam, and 12 feet depth of hold, built of the best material. The engines are two vertical cylinders, of 26 inches bore and the same stroke. They are of the locomotive pattern in design, having link motion and reversing gear; they are also low pressure, having an air-pump worked direct from the cross-head. The propeller is of cast-iron, Hibsch's patent, and is 9½ feet in diameter with 16 feet pitch. The boiler is of the return tubular pattern and has tubes 9½ feet long; the shell of the boiler is 20 feet in length; furnaces 7 feet in length by 8 feet in width. The machinery is all very compact and neatly finished, and is a credit to the builder, Mr. John Dillon of Rondout, N. Y.

The other vessel has two high-pressure engines, 20 inch bore and 20 inch stroke; propeller wheel 8 feet diameter and 13 feet pitch. These vessels are both of very handsome models, and will doubtless achieve a high rate of speed.

Master and Apprentice.

An important opinion, touching the relation of master and apprentice, was recently delivered in one of the Philadelphia Courts. Paul T. Bowen, an apprentice, was bound, with the assent of his mother, to the firm of Cox, Whiteman & Cox, in order "to learn the trade, art and mystery of stove-moulding." The firm covenant "at such times as their foundries shall be in blast" to give him employment, and to pay him \$3 50 per week for the time he shall be at work for the first three months, and an increased rate for the balance of his time of apprenticeship. Judge Ludlow held that the indenture was void, because there was no covenant for schooling, because there was no covenant for maintenance, and because the master agrees to do nothing but to pay the apprentice a certain sum, and to teach him the art and mystery of a certain trade.

Novel Attempt to Escape from Prison.

A few days since an ingenious attempt was made by a rebel prisoner to escape from the old capitol prison in Washington. He tore out a board from the side of the apartment in which he was confined in the yard, and after breaking out a bar of his window, ran the plank out and securely fastened it inside, thus making a spring board with which he hoped to jump to the roof of a small building near at hand, and thus effect his escape. The board, however, proved to be a little too springy, and instead of carrying him 12 feet, to the roof he desired to reach, carried him at least 30 feet, and over the building, among the clothes-lines, &c., in the yard, where he was finally secured by the superintendent of the building. We think the Secretary of War ought to order the release of this prisoner, after his lofty tumbling from the spring board.

Go to WORK.—The idea of "respectable employment" is the rock upon which thousands split, and shipwreck themselves and all who depend on them. All employments are respectable that bring honest gains. The laborer who is willing to turn his hands to anything is as respectable as the clerk or dapper store-tender. Indeed the man who is ready to work whenever work offers, whatever it may be, rather than lie idle and beg, is a far more respectable man than one who turns up his nose at hard labor, wears his friends with his complaints because he can get nothing respectable to do, pockets their benefactions without thankfulness, and goes on from day to day, a useless, lazy grumbler.

The Baltimore and Ohio Railroad Company is about to add 200 iron coal-cars to its equipment, in order to meet the demands of the trade.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Loop Check for Sewing Machines.—The object of this invention is to obtain a loop check which will work equally well for all kinds of work, and which can be applied at small expense to machines now in use, and to this end it consists in a check composed of a tooth of steel or other metal attached to the bobbin ring, in such position that its point is almost directly in line with the needle's motion, and arranged in such manner as to allow the loop to pass off in a backward direction. J. B. Secor, of Chicago, Ill., is the inventor of this improvement. An illustration of the invention may be found on another page of this paper.

Gaiterettes.—This invention consists in a gaiterette or ankle having a spring of steel or other suitable material inserted in the back seam, in such a manner that, by the action of the spring, the ankle of the person wearing said gaiterette or ankle, is braced and supported, and furthermore, those parts of the gaiterette contiguous to the back seam are prevented from creasing and wrinkling, and consequently a perfect fit of said gaiterette is effected. The invention consists, farther, in the arrangement of two flaps on the sides of the gaiterette and projecting from its lower edge in combination with the shank strap, in such a manner that the opening through which the heel passes is enlarged and consequently the introduction of the heel is facilitated, and at the same time the lower edge of the gaiterette is drawn up tight to the surface of the shoe and held in close contact throughout; the invention consists, finally, in cutting the shank strap in the form of a trapezoid, that side next to the heel being the longest to correspond to the varying width of the sole, in such a manner that an even strain is exerted by said shank strap on the gaiterette, and the strap itself as well as the lower edge of said gaiterette are drawn up tight to the surface with which they are in contact. G. W. Ludlow, of Elizabeth, N. J., is the inventor of this improvement.



ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING NOVEMBER 10, 1863.

Reported Officially for the Scientific American.

* * Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying 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.

40,545.—Newspaper File.—J. H. Atwater, Providence, R. I. Ante-dated Oct. 29, 1863:

I claim making one or both of the rods largest in the middle and tapering gradually toward one or both ends, so that when they are clasped together at the ends they act as springs on the paper between them.

I also claim encircling the rods toward each end beyond the paper clamped between them with elastic bands or straps, substantially as described.

40,546.—Polishing Machine.—Albert Ball, Worcester Mass.:

I claim the adjustable table forming a guide for the surface to be polished.

I also claim making the table in parts to allow projections to pass close up to the side of the wheel, substantially as set forth and described.

40,547.—Traveling Invalid Chair.—Charles L. Bander, of Cleveland, Ohio:

First, I claim the locking lever, E, for holding the chair at any inclination or extension required.

Second, The mode of propelling the chair by the arrangement of the driving wheels, K, and their cog-gearing, as herein described.

Third, I also claim the manner of guiding the movements of the chair in any direction by the guide wheels and their jointed rods, as herein described.

40,548.—Grain Separator.—J. S. Bodge, Bath, N. Y.:

I claim, first, The slides, I, having inwardly projecting arms or brackets, b, in combination with the tapering keys, j, as and for the purpose specified.

Second, The adjustable imperforate plates, H H', in combination with the riddles, F and F', as and for the purpose specified.

Third, The inclined screen, K, having one or more ridges, P, across it, as and for the purpose specified.

Fourth, The shoe, L, adapted to have longitudinal movement in the frame, E, in combination with the riddles, F and F', and imperforate plates, H and H', as described.

Fifth, Surrounding a portion of each of the perforations in the riddle, F and F', at bottom, with a sloping flange, e, as and for the purpose specified.

40,549.—Metallic Buhr.—A. T. Boon, Galesburgh, Ill.:
I claim making the grinding surface of mill buhrs of cast steel in the form of a thin circular disk, and attaching the same to the face of the iron disk or its equivalent, substantially as described.

40,550.—Gear Cutting.—A. T. Boon, Galesburgh, Ill.:
First, I claim the combination of the slotted standards, B B', screws, C C', and nuts, K K', or their equivalents, when attached to the index, G, for the purpose of adjusting the wheel to be cut, at the proper height in relation to the center, and the arrangement of the elongated bar, D, set handle screw, E, for the purpose of regulating the depth of the cut, substantially in the manner and for the purpose herein set forth.
Second, I also claim in combination with the above the attachment of my gear-cutting apparatus to a common or engine lathe, substantially in the manner and for the purpose herein set forth.

40,551.—Apparatus for making Ice.—Jesse H. Bunnell, Massillon, Ohio:
I claim, first, in combination with a box or vessel constructed substantially as herein described, the floor, A, provided with the blocks or studs, B, and cocks or vents, F F', for the purpose of preventing contact and adhesion between the ice and the floor, as explained.
Second, I claim the movable side, C, constructed and secured substantially as herein described, for rendering the ice accessible to the dividing or sawing apparatus.
Third, in combination with the slatted floor, A, E, I claim a series of cocks or vents, F F' G G', arranged as and for the purposes specified.

[By means of this apparatus solid blocks of ice of any desired thickness are produced with trifling labor and cost, and by an ingenious contrivance the ice is kept from adhering to the bottom of the vessel in which it is formed.]
40,552.—Lid or Cover for Cans, &c.—Joel Bryant, Brooklyn, N. Y.:
I claim the exclusive use of lids or covers, L, for jars or cans, when provided with an opening, V, and plug or screw, S, or their equivalent, when constructed and operating substantially as herein described and for the purposes set forth.
40,553.—Revolving Fire-arm.—J. W. Cochran, New York City:
I claim the loading and unloading rammers or pistons, d and d', connecting bar or yoke, e, with the gear lever, h, for revolving fire-arms.
40,554.—Locomotive.—P. H. Corlett, West Manchester, Pa.:
I claim making the body of the smoke box of locomotives with double plates, A B B', with an air space between them, with perforations, C C', for the purpose of protecting the outer plate from the destructive action of the heat, substantially as specified.
40,555.—Draft-regulator for Locomotives.—P. H. Corlett, West Manchester, Pa.:
I claim providing the escape pipe, C, with openings or holes, E, and valves, F, operating substantially as and for the purpose specified.
40,556.—Preserve Cans, Jars, &c.—Timothy Earl, Smithfield, R. I.:
I claim the method, substantially as described, of controlling the air vent in a preserve can or jar, by causing the same pressure which holds the cover upon the jar to secure the vent and the same motion which unfastens the cover to relieve the vent, as herein set forth.
40,557.—Gate.—S. G. Farnham, East Hartford, Conn.:
I claim making the upper rail of a gate longer than the gate itself, in combination with a double track rail plate, i, and rolls, d, arranged and operating substantially in the manner as described.
40,558.—Umbrella.—Derrick P. Felts, New York City:
I claim the hook-shaped ends of the umbrella ribs or braces, formed by bending the wire composing such ribs or braces, in combination with the usual curved pieces or runners receiving such hooks, and with the link at the back of such hooks, for retaining them in place, as and for the purposes specified.
40,559.—Piston for Steam Engines.—F. H. Furniss and Jacob Hovey, Cleveland, Ohio:
We claim the openings, E and F, valves, I, in combination with the piston, as and for the purpose set forth.
Second, The hollow screw, K, forming an adjustable valve seat, in combination with the valve, I, and piston, for the purpose described.
Third, The grooves, M, in combination with the openings and piston, as and for the purpose specified.
40,560.—Lubricator.—T. W. Godwin, Portsmouth, Va.:
I claim, first, The vertical shaft, C C', substantially as described.
Second, The tube, E, in combination with the vertical shaft, C C', substantially as shown and described.
40,561.—Machine for raising, creasing and slicking Leather.—C. W. Guest, Dexter, Mich.:
I claim the employment of the rollers, B' and R'', in combination with the unusual-sized spur gear wheels, o' and o'', and the forked and weighted lever, D, constructed, arranged and operated substantially as and for the purposes specified.
40,562.—Sugar Evaporator.—Samuel Hoyt, New York City:
I claim, first, Forming a flue communication between two or more evaporating pans arranged one above another, constructed with gradually diminished flues in their bottoms, substantially as herein described.
Second, Increasing the amount of heating surfaces of the flues in the several succeeding pans according to the different conditions of the sirup subjected to these pans, substantially as described.
Third, The combination of the inclined longitudinally-corrugated, evaporating surfaces, with the transverse receiving troughs and discharge pipes, substantially as described.
Fourth, Connecting the pan, A, with a central corrugated flue, B, passing through it and communicating with the common flue of the series of pans, substantially as described.
Fifth, Constructing the pan, A', with a corrugated evaporating plate, b', and a corrugated bottom plate, a', both plates forming a flue of increased capacity, and constituting the bottom of said pan, substantially as described.
Sixth, A series of evaporating pans, arranged in or nearly in horizontal planes, one above another, and furnished with inclined evaporating surfaces, and a common flue, running through the whole, substantially as set forth.
Seventh, in combination with the system of evaporating pans, arranged substantially as described, I claim the system of pipes, for changing the sirup from one pan to another, substantially as set forth.
40,563.—Steam Boiler.—Samuel Hoyt, New York City:
I claim, first, Constructing the shell of a steam boiler with that portion of its surface which is exposed to the fire and heat, corrugated, and that portion which is not thus exposed plain or uncorrugated, substantially as described.
Second, Combining with a partially corrugated boiler shell, the corrugated jacket, as applied thereto, and the corrugated, and inclosed that portion of the boiler shell which is corrugated, and communicates with the internal flues, B C C, substantially as described.
Third, The auxiliary fire chambers, J J, in combination with the main fire chamber, M, and flaring jacket, E, substantially as and for the purposes described.
Fourth, The combination of the internal curved flues, C C, with the central circular flue, B, substantially as described.
40,564.—Extension Bedstead.—Antoni Iske, Lancaster, Pa.:
I claim the employment of pivoted cross-slats, L, in combination with the head and foot boards of a bedstead, A and F b, or their equivalent, the front and rear portions of a side-board, B and F, with their sides, S, and S', and loose top, T, made and arranged substantially as shown, with the slotted plate, K.
I also claim the ratchet, O, in combination with the affixed or hinged head-board, A, cross slats, L, and rails, R, when arranged substantially in the manner shown for the purpose specified.
40,565.—Grain Drill.—Samuel Jolly, Ripley, Ohio:
I claim the combination and arrangement of the slides, k, cross bar, j, pitmans, i, and cranks, h, b, as and for the purpose specified. In combination with the pitmans, i, I claim the arrangement of

the U-shaped piece, s, and hand-rod, t, for disengaging the pitmans from the cross-bar, j, and temporarily suspending the delivery of seed as herein described.

40,566.—Lamp.—George A. Jones, New York City:
I claim constructing lamps, which use an impelled current of air to promote combustion, with an outer or enclosing case or shell surrounding the oil chamber, but at a little distance from it, so that the impelled current of air may pass up around the oil chamber, and in the space between it and the enclosing shell, to the wick, for the purposes set forth.
40,567.—Securing Combined Railroad Chair and Splice-piece.—Melvin W. Knox, Sheridan, N. Y.:
I claim a railroad chair and coupling combined, together with the bolts and keys secured by a spring, substantially as described and for the purposes set forth.
40,568.—Winding and Setting Watches.—Charles Eugene Laederich, St. Amier, Switzerland. Patented in France May 19, 1863:
I claim the sliding stem, d, carrying a pinion, f, that will alternately by moving it rotate the wheel, h, or the wheel, p, and thus wind up the watch, or set the hands, substantially as herein described.
I also claim in combination with the sliding stem, d, the neck, o, and sliding stop, n, for the purpose of holding said stem, and its pinion in proper position for winding the watch, its other position for moving the hands being regulated by the end of its movement, thus enabling the user to operate the parts by one hand only, substantially as described and illustrated by the annexed drawings.
40,569.—Water Elevator.—Jonathan Lilly, Castle Creek, N. Y.:
I claim the combination and arrangement of the lever, L, a ring, S, beam, b, pawl, P, ratchet wheel, R, and windlass, W, as and for the purposes set forth.
40,570.—Portable Furnace.—Albert Magee, Lawrence, Mass.:
I claim the combination in a portable furnace, of the induction cold air flue, F, smoke exit flue, G, and grate, C, when constructed and used as a utensil upon a cooking stove or range, substantially as described.
40,571.—Rotary Engine.—Adolph Millochan, New York City:
I claim the pipes, i, n and o, and valves or cocks, k k' m and m', in combination with the ring, c, and pistons acting in the steam spaces, y and z, substantially as specified.
40,572.—Breech-loading Fire-arm.—Wm. Morgenstern & Edward Morwitz, Philadelphia, Pa.:
We claim, first, The breech block, C, constructed, arranged, and operating substantially as herein described and represented.
We also claim the combination of the bolt and needle or hammer, with the main spring, lever, dog, and trigger, for the purpose of cocking, and letting go, said bolt and needle or hammer, substantially as described.
40,573.—Keyed Instrument of Music.—Francis Peabody, Salem, Mass.:
I claim, first, In keyed instruments the use of concentric series of dents, I, J, or their equivalents, mounted on removable plates, M, and arranged relatively to a removable series of levers, C, so as to operate in connection with each other and with the automatic works of a keyed instrument, substantially as and for the purpose herein set forth.
Second, I claim the division of the levers into two independent sets, C C', operated on opposite or nearly opposite parts of the plate, G, substantially as and for the purpose herein set forth.
Third, I claim the speed regulator composed of the hollow shaft, L, changeable rings, N N', and adjusting rod, P, arranged to operate in connection with each other and with the automatic works of a keyed instrument, substantially as and for the purpose herein set forth.
40,574.—Portable Fence.—H. Parker Ross, Hastings, N. Y. Ante-dated Oct. 24, 1863:
I claim providing the panels with the staples, B, and movable post, C, in combination with the dowel, A, the whole constructed and arranged in the manner and for the purpose herein set forth.
40,575.—Machine for Tanning.—Volney E. Rusco, Chicago, Ill.:
I claim the machine for tanning hides, constructed and operated in the manner set forth.
40,576.—Disintegration of Vegetable Substance for the Separation of Fibers, &c.—George Escol Sellers, Hardin County, Ill.:
I claim, first, The disintegration of vegetable substances, in the manner substantially as described and for the purposes specified.
Second, The utilizing of the non-fibrous portions of vegetable substances when separated from the fibrous portions, for the purposes specified.
40,577.—Reducing Hemp, Flax, &c., to a Fibrous Condition.—Rebecca Sherwood, Fort Edward, N. Y.:
I claim, first, The use of the solutions combined as described for the purpose of reducing hemp, flax, grass, straw, and other fibrous substances to a textile fiber for the manufacture of textile fabrics and pulp for paper, substantially as described.
Second, The use of coal oil, naphtha, benzine, or other liquid hydrocarbon either alone or combined with alkaline or soapy solutions for the purpose of reducing hemp, flax, grass, straw, and other fibrous substances to a textile fiber for the manufacture of textile fabrics, or for pulp for all kinds of paper, substantially as described.
40,578.—Truss for Hernia.—Daniel C. Smith, Adrian, Mich.:
I claim, first, The screw, F, and nut, G, operating in connection with the projections, D and E.
Second, I claim the joint, B B, as above described for the purposes set forth and described.
40,579.—Sugar Evaporator with Automatic Feeder.—George Stevenson, Zionsville, Ind.:
I claim, first, Regulating the flow of juice to the evaporating pan, B, by means of the float, I, when so arranged as to rise and fall by the action of the juice in the pan and by its operation control the admission of juice thereto, substantially in the manner and for the purpose herein described.
Second, I claim in combination with the division, c, of the evaporator, B, set below the level of the other part or parts as herein described, the combination and arrangement of the damper, m, plate, k, flues, l', air chamber, o, and side doors, n, substantially as herein shown and described.
Third, I claim in combination with the pan, B, or division thereof, c, the thin metal side chamber, p, constructed and arranged in connection therewith, substantially in the manner and for the purpose described.
40,580.—Billiard Cushion.—John Syrcer, Buffalo, N. Y.:
I claim the application and use of a strip of horn, in connection with an india-rubber pad for the purpose of making an improved billiard cushion, substantially as herein described.
40,581.—Mold for Forming Artificial Teeth.—J. Terrell, Philadelphia, Pa.:
I claim, first, The stationary projections, a, for forming recesses in the teeth, in combination with the key, E, and movable strips, D, for permitting the teeth to be withdrawn from the said projections, in the manner described.
Second, The employment of the movable pins, G, in the matter and for the purpose described.
40,582.—Horse Collar.—James H. Van Sice, Buffalo, N. Y.:
I claim a horse collar having an elastic and flexible pad, B, stuffed rim, A, and roll, C, constructed substantially as described.
40,583.—Device for Locking Screw Nuts.—Wm. F. Vernier, Philadelphia, Pa.:
I claim the plate, L, with the lugs, N N, and the rods, G and M, constructed and applied substantially as above described and for the purposes set forth.
40,584.—Cutting Machine.—G. J. Wardwell, Coaticook, Canada:
I claim the guide blocks, T and U, packing blocks, C', bolts, a', clamp rods or bolts, b', arranged and combined as herein specified. I also claim the corrugations on the sides of cutters or drills, S, and corresponding corrugations on the inner surfaces of head guide blocks, T, packing block, c', bolts, a', clamp rods or bolts, b', as arranged and combined for effecting the objects specified.

I also claim the double-acting feed arm or plate, q', connecting rod, U, vibrating lever, r', combined and arranged in the manner and for the purpose herein described.
I also claim the standards, H, arranged on the outside of frame, A, in the manner and for the objects specified.

40,585.—Harvester.—S. S. Bartlett, Providence, R. I., assignor to himself and T. H. Dodge, Nashua, N. H.:
I claim the combination in a mowing machine of a tilting frame to which the finger beam is attached and a hinged tongue in such a manner as that the frame and tongue shall both have a common axis of motion, while in drawing the frame and cutting apparatus forward the draft thereof shall come directly upon the metal tongue socket pieces, or their equivalent, and not upon the main axle, whereby much friction is avoided and the machine rendered of more easy draft, substantially as described.
40,586.—Machine for Twisting Wires for Marking.—Martial Dimock, Newark, N. J., assignor to Porter Fitch, Brooklyn, N. Y.:
I claim, first, The construction of the shaft, a, having the aperture, l, and the double tenon, k, substantially as shown and described.
Second, The construction and use of the sliding shaft, l, having the double tenon, h, and the notches in the shoulder, o, substantially as shown and described.
Third, The arrangement and use of the shaft, a, having aperture, l, and notches in the sliding shaft, l, with its double tenon, h, and notches in the shoulder, o, in connection and co-operation with each other and with the shaft, w, when used for twisting wires, substantially as shown and described.
40,587.—Tool for Manufacturing Knitting Burrs.—Horace Fisher, Waterford, N. Y., assignor to himself and Fuller and Safely, Cohoes, N. Y.:
I claim the combination of a spindle, E, and its button, G, screw and nut, N, with a follower, K, and collar, H', substantially as described and for the purpose set forth.
40,588.—Screw-cutting Machine for Nicking Screw Blanks.—J. C. Rhodes (assignor to B. Hobart & Son), East Bridgewater, Mass.:
I claim the improved machine or combination constructed in manner and so as to operate substantially as above described, such machine not only having an inclined feeding trough, M, a blank receiver or carriage, F, a presser, N, a rotary saw or cutter, E, a discharger, O, and saw adjustments, substantially as hereinbefore described, but being provided with a spring, K, applied to the blank receiver or carriage, so as not only to retract the latter, but to enable it to move in an opposite direction under derangement of a screw blank, as set forth.
40,589.—Loop-check of Sewing Machines.—J. B. Secor (assignor to himself and W. H. Butler), Chicago, Ill.:
I claim having the lower face of the bobbin ring, A, provided with a recess, a, and a loop-check, b, projecting over a portion of such recess, the whole constructed, arranged and operating together, substantially in the manner herein shown and described.
[See engraving on page 352.]
40,590.—Wrench.—G. C. Taft, Worcester, Mass., assignor to T. H. Dodge, Nashua, N. H.:
I claim the combination of the parallel grooves, d d d, in the shank, A, in the corresponding projections, e e e, on the rosette, D, the same not being spiral but running at right angles to the line of motion of the jaw, thus relieving the ferule from all strain while retaining the rosette in the same relative position as respects the handle of the wrench, substantially as and for the purposes set forth.
40,591.—Gas Heating Apparatus.—S. Lloyd Wiegand (assignor to Abraham Hart), Philadelphia, Pa. Ante-dated Nov. 2, 1863:
I claim, first, The combination of the burner, H, and adjustable cap, J, with the funnel, X, when used in the manner and for the purpose set forth.
Second, Combining the external fender or chimney, C, with the burner, H, adjustable cap, J, and funnel, X, for the uses hereinbefore specified.
Third, The manner of attaching the boiler and fender to the base ring, E, by means of the lugs, T T, and projections, Z Z, ring, G, and bolts, D D D, when in combination with the adjustable screw funnel, constructed and used in the manner set forth.

RE-ISSUES.

1,565.—Evaporator for Saccharine Liquids.—F. D. Drake, Four Corners, Ohio. Patented Jan. 6, 1863:
I claim the return flue, C, applied in combination with the furnace, A, and pan, B, substantially in the manner and for the purpose herein set forth.
[This invention consists in the employment or use of a furnace with a return flue or flues, in such a manner that the heat applied to the liquid in the pan is graduated from the highest temperature in one portion of the pan down to below the boiling point in the other portion or portions, and that thereby the scum is thrown off towards the coolest portion or portions of said pan, where it can easily be removed, and the danger of imparting an unpleasant taste to the molasses by boiling the sap in the mass is obviated, and furthermore a saving of fuel is effected.]

1,566.—Grain Separator.—James Fergusson, Dubuque, Iowa. Patented Nov. 5, 1861:
I claim, first, Dividing, screening and concentrating grain or other substances in their passage over and through one or more riddles, substantially as described.
Second, The riddle boxes, D, operating in the manner substantially as described, and for the purpose set forth.
Third, The combination of the riddle, D, spring, G, and eccentric, f, or its equivalent, substantially in the manner and for the purposes described.
Fourth, The combination of the box riddles, D, pins or their equivalents, j, and bottomless hopper, E, substantially as and for the purposes described.
Fifth, The combination of the box riddles, D, and the cockle screen, I, substantially as and for the purpose described.
Sixth, The combination of the riddles or riddle boxes, D, and fan, B, substantially as and for the purposes described.
Seventh, The adjustability of the hopper, E, relatively to the upper riddle box, D, substantially in the manner and for the purposes described.
1,567.—Gaiter.—G. W. Ludlow, Elizabeth, N. J. Patented April 21, 1863:
I claim as a new article of manufacture a gaiterette, A, constructed as hereinbefore described, with flaps or projections, C, connected by a shank strap, D, of trapezoidal form.
1,568.—Grid-iron.—O. F. Morrill, Chelsea, Mass. Patented Dec. 6, 1859:
I claim an improved steak broiler, as not only made or provided with a deflector for its grid, but as having a heat passage arranged underneath such deflector, and surrounded by a gravity trough, substantially in manner as specified.
I also claim the grid, as provided with a deflector arranged with respect to the bars of the grid, as specified.
I also claim the gravity pan as made with a trough and a heat passage, arranged substantially as specified.
1,569.—Hemming Guide for Sewing Machines.—Alfred and L. D. Davis, Worcester, Mass: assignees by mesne assignments of S. E. Blake and Thomas Johnston, Louisville, Ky.:
We claim, first, The hem turner, G, combined with and attached to a spring, B, applied and arranged for adjustment to a sewing machine, substantially as described and set forth.
Second, The combination and arrangement of the hem turner, G, spring, B, and roller, f, substantially as and for the purposes set forth and specified.
Third, The yielding spring plate, E, with its hem turner, G and B', with its presser piece, H, in combination with the adjustable gage, C, substantially as described and specified.
Fourth, The yielding presser roller, K, to smooth, flatten and prevent the hem or tuck to the action of the needle as the material is fed forward for stitching, substantially as described and set forth.
Fifth, The presser piece, H, attached to the spring, B', and holding the material to the feeding surface of the sewing machine, in combination with the hem turner, G, substantially as set forth and specified.

Sixth, The combination and arrangement of the hem turner, G presser piece, H, roller, K, and adjustable gage, C, substantially as described and for the purposes specified.

DESIGNS.

1,839 to 1,847.—Nine Patents for Carpet Patterns.—E. J. Ney (assignor to the Lowell Manufacturing Company), Lowell, Mass.

1,848.—Turn-over Collar.—Chas. H. Welling, New York City.

IMPORTANT TO INVENTORS.

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is free, given, without charge, on sending a model or drawing and description to this office.



Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of \$5, accompanied with a model of drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one; or, if the invention is a chemical production he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by a draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is reduced from \$30 to \$15. Other changes in the fees are also made as follows:—

On filing each caveat.....	\$10
On filing each application for a Patent, except for a design.....	\$15
On issuing each original Patent.....	\$20
On appeal to Commissioner of Patents.....	\$20
On application for Re-issue.....	\$30
On application for Extension of Patent.....	\$50
On granting the Extension.....	\$50
On filing a Disclaimer.....	\$10
On filing application for Design, three and a half years.....	\$10
On filing application for Design, seven years.....	\$15
On filing application for design, fourteen years.....	\$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted, by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the inventors throughout the country we would state that we have acted as agents for at least TWENTY THOUSAND inventors. In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is \$10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

ASSIGNMENTS OF PATENTS.

Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.



H. W., of N. Y.—The item you criticize in relation to the small engine was published as the result of actual experiments carefully made, and the power is the result of the conditions mentioned in the items; it is not guess work; we see no ground for argument. We do not wish to revive the old discussion about working steam expansively.

D. J. P., of Wis.—Address F. Pease, Buffalo, N. Y., for a good machine oil.

A. G., of N. Y.—You will find an illustrated description of Ericsson's calorific engine on page 268, Vol. XIII. (old series) of the SCIENTIFIC AMERICAN.

E. W. H., of Wis.—An expanding shot for cannon is not new. It has frequently been shown to us since the war commenced.

A. M. V., of R. I.—George Steers.

N. & S., of N. H.—Address the Collinsville Co., Collinsville, Conn., for cast-steel castings.

Qua., of C. W.—Use a short pipe and a long shaft; but place your engine nearer the boiler, if possible. Avoid long steam pipes, for although shafting consumes power, it is not so great a source of waste as the loss of heat from the steam caused by a long pipe.

G. W. K., of Pa.—India-rubber will not destroy magnetism in steel. It is an insulator, but not a destroyer of electricity. A magnet will attract iron, although a piece of glass may be interposed between the two; and glass is a better non-conductor than india-rubber.

R. B. D., of Ky.—A mistaken idea is conveyed by the use of the term "mechanical powers" for the lever, the inclined plane, &c. There is no power in a lever, inclined plane, wheel or axle. These are merely mechanical agents for communicating power. A fulcrum is simply a point or place of rest for a lever. Your article does not make the proper distinction respecting the nature of these agents.

B. & R., of Ill.—The chloride of silver may be reduced to a metallic condition by feeding strips of zinc into a solution of the chloride acidulated with muriatic acid, when the silver will be precipitated and the chlorine will unite with the zinc. Wash the precipitated silver, then dry it thoroughly and melt in a crucible. If fused with the carbonate of soda or potash, in a crucible, the chloride of silver will also be reduced to metallic silver.

E. W. M., of Mass.—Steam cars for city railroads are quite practicable. Do not be afraid of street mud as an obstruction, for the engine can keep the rail clear by using brushes in front of the wheel. You will find a locomotive and car for city railroads illustrated on page 257, Vol. V. (new series) of the SCIENTIFIC AMERICAN.

C. G. S., of Md.—Bourne's improved catechism of the steam engine, published by D. Appleton & Co., of this city, will give you the desired information about valves. Large works on steam engines are very high in price at present.

R. B. K., of Ky.—Perhaps no person will dispute your proposition respecting the results obtained by making the fulcrum of the lever the driver; but there is no inherent power in a lever.

G. F. W., of Fairport.—We have not a single spare number of our paper which contains the engraving of Page's electro-magnetic engine. You can obtain a magnetic helix of Messrs. Chester, 104 Center street, this city.

C. S., of N. Y.—All the black chromate inks made with logwood deposit a thick sediment. A remedy for preventing the precipitate has been found in gum arabic, but we prefer the evil to the remedy, as the gum clogs up the pen and the ink does not flow so freely.

E. D. B., of N. Y.—A Board of Examiners for applicant engineers to the navy meets at different places, and the time and place of meeting are usually advertised before-hand. You will find information respecting the mode of applying for examination on page 187, Vol. VII. (new series) of the SCIENTIFIC AMERICAN.

W. S. S., of Mass.—We are not acquainted with any odorless solvent of india-rubber. Benzole is a good solvent, and is not very unpleasant to the sense of smell—some people rather like it. Naphtha—a very good solvent—has a very unpleasant odor.

A. M. D., of N. Y.—Portable saw-mills were manufactured a few years ago, by W. Montgomery, of Youkers, N. Y., and J. Brown, of Baltimore, Md., but we know not whether these manufacturers are now engaged in the business.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, Nov. 11, to Wednesday, Nov. 18, 1863:—

- A. J. M., of N. Y., \$25; L. O. C., of Pa., \$25; J. D. H., of N. Y., \$41; W. F. R., of N. Y., \$16; R. H. R., of N. Y., \$20; T. J. T., of Md., \$20; A. B., of Conn., \$20; H. A. A., of N. Y., \$20; A. T., of N. Y., \$20; T. & J., of N. Y., \$20; J. H. R., of N. Y., \$20; C. F. T., of N. Y., \$45; S. B. W., of Kansas, \$20; B. & B., of Mass., \$30; C. C. A., of N. Y., \$48; H. M., of Ill., \$25; J. A. L., of N. H., \$16; R. B. C., of Mass., \$46; C. & B., of Mass., \$16; J. W., of Iowa, \$25; T. G., of N. Y., \$33; C. F. B., of Conn., \$250; E. S., of N. Y., \$10; D. E. C., of N. Y., \$25; W. S., of N. Y., \$41; S. H. M., of Ill., \$20; J. W., of Iowa, \$20; A. G., of N. Y., \$20; G. H. R., of N. Y., \$15; B. M., of N. Y., \$16; E. H., of N. Y., \$45; P. M. R., of Cal., \$30; F. W. B., of N. Y., \$16; J. A. H., of Pa., \$20; W. M. of Ill., \$15; R. E. & A. G., of N. Y., \$25; E. L., of Vt., \$16; L. W. F., of Ind., \$16; D. & C., of N. Y., \$16; R. B., of Pa., \$25; G. & F., of N. Y., \$24; W. E. C., of Ill., \$15; W. & H., of Cal., \$50; J. H., of Ill., \$25; W. W., of N. Y., \$41; R. H., of Mass., \$25; J. J., of Maine, \$14; W. N., of N. Y., \$16; C. C., of N. Y., \$41; V. W. B., of Vt., \$20; J. E., of N. Y., \$20; J. N. B., of N. Y., \$16; E. C. W., of N. Y., \$20; J. P., of N. J., \$20; G. F., of N. Y., \$20; R. J. S., of N. Y., \$20; A. C. E., of Mass., \$25; F. H. C. M., of N. Y., \$16; R. D. C., of England, \$100; W. K., of N. Y., \$16; D. P. S., of N. Y., \$16; G. B. R., of Ill., \$16; J. P. C., of Ill., \$16; C. W. B., of Conn., \$12; G. S., of N. Y., \$150; D. L., of Vt., \$25; J. H., of N. Y., \$15; M. H. F., of N. Y., \$16.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgement by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Nov. 11, to Wednesday, Nov. 18, 1863:—

- A. J. M., of N. Y.; D. E. C., of N. Y.; W. S., of N. Y.; R. E. & A. G., of Pa.; J. H., of Ill.; H. M., of Ill.; E. S., of N. Y.; R. H., of Mass.; S. & G., of Pa.; C. W. B., of Conn.; D. L., of Vt.; W. W., of N. Y.; J. D. H., of N. Y.; A. C. E., of Mass.; H. H. H., of N. Y.; H. T. S., of Pa.; L. O. C., of Pa.; W. S., of N. Y.; B. & R., of N. Y.; J. W., of Iowa; T. G., of N. Y.

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing notes to this office, stating the name of the patentee and date of patent, when known, and inclosing \$1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1863, to accompany the claim, on receipt of \$2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

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 our reception of their funds.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of Instructions to Inventors, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York.

Binding the "Scientific American."

It is important that all works of reference should be well bound. The SCIENTIFIC AMERICAN being the only publication in the country which records the doings of the United States Patent Office, it is prepared by a large class of its patrons, lawyers and others, for reference some complaints have been made that our past mode of binding in cloth is not serviceable, and a wish has been expressed that we would adopt the style of binding used on the old series, i. e., heavy board sides covered with marble paper, and morocco backs and corners. Believing that the latter style of binding will better please a large portion of our readers, we commenced on the expiration of Volume VII. to bind the sheets sent to us for the purpose in heavy board sides, covered with marble paper and leather backs and corners. The price of binding in the above style is 75 cents. We shall be unable hereafter to furnish covers to the trade, but will be happy to receive orders for binding at the publication office, No. 37 Park Row, New York.