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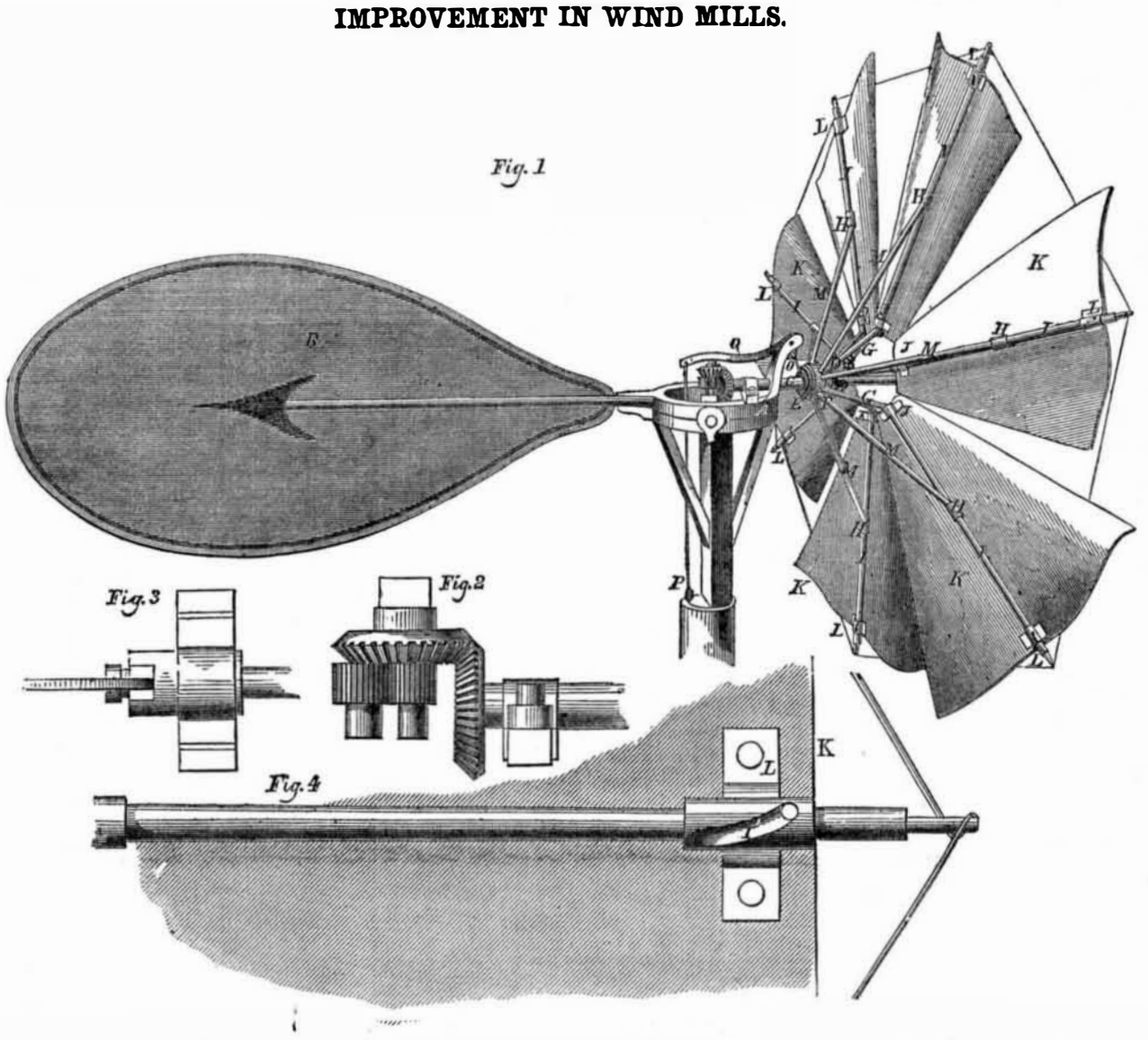
Agricultural Science, Droughts, and Pulverizing the Soil.

The State Agricultural Chemist of Maryland, Mr. Higgins, has published a paper showing the necessity of droughts to replenish the soil with mineral substances, carried off to the sea by the rains, and also taken up by the crops, and not returned by manure. These two causes, always in operation, would, in time, render the earth a barren waste, in which no verdure would quicken, and no solitary plant take root, if there was not a natural counteraction by drought, which operates to supply this waste in the following manner: During dry weather, a continual evaporation of water takes place from the surface of the earth, which is not supplied by any from the clouds. The evaporation from the surface creates a vacuum, so far as water is concerned, which is at once filled by the water rising up from the subsoil of the land; the water from the subsoil is replaced from the next strata below, and in this manner the circulation of water in the earth is the reverse to that which takes place in wet weather. With this water also ascend the minerals held in solution, the phosphates and sulphates of lime, carbonate and silicate of potash and soda, which are deposited in the surface soil as the water evaporates, and thus restores the losses sustained as above stated. The author of this theory appears to have taken considerable pains to verify the fact by a number of interesting experiments. The subject is worthy the attention of men of leisure and of education, who pursue the rational system of blending chemistry with agricultural science."

[The above is from the Philadelphia *Ledger*, and contains evidence within itself of correctness. In connection with this, let us point out the benefits of keeping the soil well pulverized or cultivated, to prevent the mineral and other food of plants from being carried away with rains. England has a moist climate, subject to great rains, and is seldom visited with droughts, and yet more wheat is raised to the acre than anywhere in the world. Why is this? Simply on account of the universal practice of draining and keeping the soil in a highly pulverized state. When the soil is kept porous, it absorbs ammonia and carbonic acid gas from the atmosphere, and when rain falls these are carried down into the soft porous soil, and are taken up as food by the plants. If the soil were hard and caked, the rains would run violently off the surface, carrying away some portion of the soil, and with it the food so necessary to supply the plants with nourishment. The benefits to be derived from keeping the soil of cultivated fields well pulverized and open, cannot be too highly extolled.

We regret to learn that Mill No. 1, Manchester, N. H., was burned down on the 15th inst. It caught fire by the bottom of the watchman's lantern dropping off among some roving in the carding room. The loss amounts to about $200,000, and 500 hands are thrown out of employment.

IMPROVEMENT IN WIND MILLS.



The annexed engravings represent an improvement in Windmills, for which a patent was granted to Addison P. Brown, of Brattleboro', Vt., on the 3rd, of this month.

The nature of the improvement relates to the method of regulating the obliquity of the sails, by which they are rendered self-adjusting, according to variations in the velocity of the wind.

Figure 1 is a perspective view of the principal parts; fig. 2 is a view of the gearing for transmitting the motion from the wind or driving shaft to the main driven vertical shaft, and figs. 3 and 4 are sections—the latter on an enlarged scale, showing an arm of the wind sail, and the curved slot, I', which allows the sail to adjust itself to the wind pressure. Like letters represent similar parts. A is the turn-table on which the wind shaft is supported and rotates; B is the vane; C is the main driver shaft rotated by the wind sails. D is a collar securely fixed on this shaft by a screw. E is the hub which carries the sails. It is allowed to slide on the shaft, C, to which it is secured by a key working in a spline or slot, but rotates with the shaft. F is a spiral spring, having its tension to keep the collar, D, and hub, E, separate. G G are metal bars, connected by hinges to the hub, D. H are thimbles which slide on the arms, I, that carry the sails. J J are hinges firmly attached to the sails, K K. L is a hinge (one on each arm) it is heavy, being virtually a weight, the centrifugal force of which governs the sail; this hinge is also a thimble enclosing the arm of the sail, as shown in fig. 4, and it has a helical slot, I', in it in which is a pin, that turns the sail edgewise, when the centrifugal force of L is increased by an accelerated speed. M M are braces which extend from the arms of the sails to a sliding collar on the other side of the one D. O is a sliding washer pressed up against the hub by a weight, P, suspended from a jointed bent lever, Q, thus enabling the attendant to increase the force of the spring, F, by increasing the weight.

Any sudden impetus of the wind moves the sliding hub, overcoming the tension of the spring, F, lifting the weight, P, and the bars, G, by means of the thimbles, H H, which push the sails further out upon the arms, while the helical slots, I', and pins in them turn all the sails simultaneously edgewise, to an extent proportionate to the increased force of the wind. Any acceleration of the wind regulates the positions of the sails, as described, and thus they are self-adjusting. The motion is communicated from the shaft, C, by bevel gearing, as shown in fig. 2, or in any of the usual ways whereby rotary motion is communicated to the vertical shaft, and from thence to any machinery in the building below.

More information may be obtained by letter addressed to the patentee, at Brattleboro', Vt.

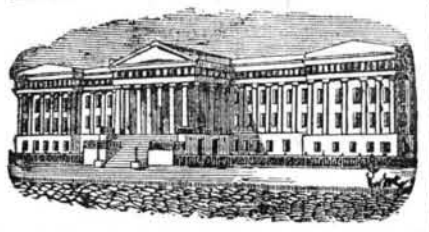
Grasses for Reclaiming Sand Drifts on the Sea Shores.

There has been received in the Patent Office, from Holland, the seeds of the sea reed, (*arundo arenaria,*) and the upright sea lyme grass, (*elymus arenarius,*) which have long been used in that country for reclaiming the sand drifts on the sea coast. These seeds have been imported for experiment all along the Atlantic coast, from Maine to Florida. The nutritive matter of these grasses is not sufficient to make them worthy of cultivation out of the influence of the salt spray. The elymus arenarius rather exceeds the sea reed in nutritive qualities; but from the habit of the latter in its natural place of growth, it is of greater utility, particularly when combined with the former, as it binds the loose sands of the sea shore, and thereby raises a durable natural barrier against the encroachments of the ocean upon the land. Indeed, the effect of the two grasses combined in protecting coasts from the wasting influences of storms and currents is such, that Holland owes her very existence, in a considerable degree, to their preserving influences.

In the reign of George I., the acts passed for the planting and preserving the same from injury were extended to the coasts of England. In passing further penalties for its inviolability, it was rendered penal not only for an individual—not even excepting the lord of the manor—to cut the bent, but for any one to be in possession of any within eight miles of the coast. This plant is also applied to many economical purposes—hats, ropes, mats, &c., being manufactured from it.

A New Destructive Bomb Shell.

A number of our cotemporaries state that Prof. Anderson, formerly of the Clinton Institute, has invented a new destructive shell, which can soon wrap any fortification in flames, and destroy any city in fifteen minutes. From the description of it, Sebastopol will soon be nowhere. When it is fired and strikes, it sends up a large sheet of flame, which burns with great intensity for a considerable period. It appears to be a shell filled with combustible materials, such as turpentine, resin, chlorate of potash, ignited much in the same way as the explosive shells of Mr. Hubbell, of Philadelphia.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office,

FOR THE WEEK ENDING JULY 17, 1855.

MODE OF MOUNTING ORDNANCE—Charles F. Brown, of Warren, R. I.: I claim mounting a cannon or any other piece of ordnance, substantially as described, in a carriage, A, of spherical, spheroidal, or other circular form, externally, which carriage is arranged to close the port or embrasure through which the piece works, but to turn freely therein in a horizontal or nearly horizontal direction, and which has an opening, c, within it of suitable size and form to receive the gun and to allow it the necessary upward and downward swinging movement on its trunnions, whereby an efficient protection is afforded against the entrance of the enemy's shot or projectiles, and the smoke of the discharge is excluded, and at the same time a desirable range in a lateral and vertical direction is maintained.

[The object, nature, and construction of the foregoing improvement is so clearly set forth in the above claims, that no further explanation is needed. It is an important invention connected with the art of war—one which would be of vast importance to the Russians at Sebastopol, did they now possess the same. It was only by the last steamer's news that we read an account of the terrible losses and difficulties which they experienced for want of some easy means of closing the embrasures of their forts when exposed to the fire of the Allies. They had erected massive walls of masonry within, between the guns, which greatly cramped them for room and air; they had dug caves behind the guns, into which the men could sink and save themselves from exploding shells; and they had been driven to other extremities from the same cause, which weakened their efforts at defence. In our opinion no fortress is complete without this improvement. We presume it will be speedily adopted not only by our own government, but by all others. Foreign patents have already been obtained through the Scientific American Agency. The invention reflects great credit upon the genius of the patentee, who is an old and successful inventor.]

LANTERNS—C. H. Butterfield, of South Lancaster, Mass.: I do not claim any particular form of spring, nor the application of my improvements to any particular style or kind of lamp or lantern.

But I claim attaching a yielding or springing plate to the cap, in combination with a match holder, so that lifting or throwing off the cap shall light a match placed so as to light the wick or lamp.

WINDOW BLINDS—W. H. Bixler, of Easton, Pa.: I do not claim the employment of a single fusee applied to a blind or shade, for they have been previously used.

But I claim the attachment of two fusees, f h, connected by a cord, j, a spring, i, being attached to the one fusee, h, and the cords, c c, to the fusee, f as shown, and for the purpose set forth.

[This invention relates to the spring window curtains used in carriages and for other purposes. It consists in a combination of two conical fusees with a coiled spring, at one end of the window sash roller, in such a manner that the force of the spring is equalized, and the sudden jerking up of the curtain is avoided. The two fusees are connected by a cord which winds from the small end of one of the fusees on to the large end of the other. This device is simple, but it is very useful. Curtains thus arranged are raised evenly, neatly, and steadily, consequently they are less liable to be torn, and the apparatus does not get out of order.]

NUT MACHINES—R. H. Cole, of St. Louis, Mo.: I claim arranging the movable bottom, j, of the nut box, in such a manner in relation to the movements of the punch, d, that when a nut is being formed in the nut box, its bottom will be forced against a yielding support, for the purpose of insuring in all cases perfectly shaped nuts, and enabling the machine to self-adapt itself to bars of different thicknesses, substantially as set forth.

INVALID BEDSTEADS.—Benjamin Eastman, of Philadelphia, Pa.: I make no claim to elevating the patent by means of frame, A, with cords and pulleys, as such has been done before.

I claim the apparatus described, composed of a shaft, H, arms, P, hooked cords, Q, in combination with the detachable sacking, and vertically moving shaft bearings, arranged and operating substantially as set forth, for the purposes specified.

OPERATING VALVES OF PUMPS—Jacob Edson, of Boston, Mass: I do not claim a tripper for the purpose of opening the valves by the descent of the piston, as such have been used before.

But I claim the peculiarly formed tripper described, in combination with the curved cap of the valve, D, by which means a single tripper is made to open both valves, in the manner set forth.

I also claim the twisted partition, Q, for the purpose set forth, whereby the cylinder is divided into two water passages which deliver the water upon the opposite side from that on which they receive it.

FORMING METAL TUBES—Edwin Ells, of Ansonia, Ct.: I do not claim the employment of rollers alone to give form to the tube, neither do I claim bringing the strip or skelp of metal of which the tube is to be made to a form whose transverse section resembles the letter U, when this is performed by separate means unconnected with the rollers.

But I claim arranging the rotary bur-cutter, I, between the preparatory U-shaped die, a b, and the rollers, G G', substantially as described, whereby the scarfing operation is performed at the same time as the forming operation, and the forming machinery serves to hold and feed the strip or skelp in a suitable manner to receive the scarfing operation.

[The foregoing patent relates chiefly to the manufacture of brass, copper, and iron lap-welded or brazed tubes, for boilers and other purposes. Heretofore the scarfing or beveling of the outer edge of the metal, in order to complete the external rotundity of the tube, has been done by hand. Mr. Ells' machine, not only forms the tubes rapidly out of the skelp, or flat strip, but also scarfs them off as fast as formed. The whole operation is clearly set forth in the claim. This is an ingenious and valuable improvement.]

ADJUSTABLE VISES—John Fraser, of New York City: I am aware that adjustable vises have been previously used, but the jaw only has been arranged so as to turn, the screw remaining stationary, and consequently they operated very imperfectly, as the line of pressure, and the axis of the screw were not in line.

I do not claim, therefore, an adjustable vise irrespective of the construction shown.

But I claim having the screw, F, which passes through the movable jaw, I2, pass through a nut, G, so arranged as to turn, and cause the screw and movable jaw to turn, when wedged or taper-shaped articles are to be held, so that said jaw, E, will conform to the obliquity or taper form of the articles, and cause them to be securely grasped by the jaws.

[This improvement consists in attaching to the fixed jaw of the vise, a movable nut, through which the screw passes, whereby the loose jaw can be turned or adjusted at pleasure, to suit the surface of the article to be held. No matter what the angle or bevel of the article, the jaw adjusts itself accordingly, and so a firm hold is always secured. The improvement increases the expense of a vise but very little. It is a good invention and will find a wide introduction. Logan Vail & Co., of New York city, are the assignees and owners of the patent.]

HARROWS—William Gourley, of Clarke County, Va.: I do not claim any of the parts separately; nor do I claim so attaching to a clod cutter, or harrow, a roller that may be adjusted, to any given hight from the ground, as this has been done before.

But I claim arranging in connection with a clod cutter, a cutting roller, which may adapt itself to the inequalities of the ground, and also be made to throw its weight upon the clog cutter, or not, as desired, substantially in the manner and for the purpose set forth.

SAFETY RAILROAD DRAW-BRIDGES—J. K. Gamble & W. P. Gamble, of Philadelphia, Pa.: We claim the contrivances described, or their equivalents, so arranged and combined as to constitute a safety railroad draw-bridge, substantially as set forth.

[The many lamentable accidents which have occurred on some of our railroads, within the past few years, in consequence of neglected draw-bridges, have given developement to several new mechanical devices for affording better security at such crossings. One of the best of these inventions forms the subject of the above patent. The patentees propose to place side branch tracks at each end of the bridge, and to have the switches of these branches permanently connected with the draw, in such a manner that when the draw opens the switches move and connect the side track with the main. Consequently, should a train approach while the draw is open, it must of necessity pass on to the side track, and avoid accident. The side tracks are to be inclined, so as quickly to stop the headway of the train. This invention prevents the possibility of accident, whether arising from the carelessness of signal-men or the neglect of engine-drivers. It is a good improvement; we commend it to the attention of railroad corporations.]

ROSIN OIL LAMP—Francis Blake, of Needham, Mass.: I claim, first, the air chamber, G, within the lamp, in connection with the circuitous passage, F, for the purpose set forth.

Second, the button, I, in combination with the button, L, and opening, H, whereby the quantity of air that is admitted to the interior of the flame is adjusted to the hight of the button above the wick, as described.

Third, I claim the draft regulator, N, constructed and operating in the manner substantially as set forth.

FAN BLOWER—J. C. Gartley and Jacob Fox, of Philadelphia, Pa.: We also claim, where an ordinary parallel hub is used, a circular plate or pieces of plate fastened to the hub and blades, E, of blowing wheel, inclosing the greater portion of the side of blowing wheel towards the side, K, to answer the same purpose for which the larger portion of the conical hub is intended, which is to prevent a central reacting current after it has passed through the blowing wheel.

We claim the combination and arrangement of fan blower, as described.

We do not claim the parts described, separately; but we claim the combination, in the manner set forth or shown, for the purposes named.

EXPANDING AUGER OR BIT—L. H. Gibbs, of Washington, D. C.: I claim, first, the adjustable plate, B, with the rib, d, the lip, j, the index holes, c c c c, in it, combined with the auger, A, with slot, D, the tapering pins, g g, and set screw, h, as described and for the purposes set forth.

RAILROAD CAR COUPLING—John Ryan, of Wilmington, Del.: It is obvious that whilst the gist of my invention lies in the peculiar forms of the coupling bar and heads, yet these forms may be varied and still produce the same effect, and I should claim the right of changing the forms of both or either, so long as I do not part from the general characteristics of the invention. I do not claim a gravitating hook, nor do I claim a side moving hook for self uncoupling, independent of its particular connection with the draw heads.

But I claim the surfaces of the hook, and inside and outside of the buffer mouth, so arranged and constructed that the hook, presented in a vertical position, shall be caused to rotate to a horizontal position on entering, and resume its vertical position when driven in to hold the cars, and by a deviation of the cars to one side, caused to rotate again to a horizontal position, so as to uncouple by said deviation, and the leverage between the hook and heads, the buffer mouth not allowing the hook to pass either way, except when horizontal.

GUIDES FOR SEWING MACHINES—Frederick R. Robinson, of Worcester, Mass.: I claim the combination of the seam gauge or guide with a sewing machine.

CROSS-HEAD ATTACHMENT FOR WORKING STEAM ENGINE VALVES—John B. Stoit and Alexander Ferguson, of Troy, N. Y.: We claim the method of operating the valves of steam cylinders by the process described, to wit: By a series of trips attached to, and sliding with the cross head of the piston, which trips operate in succession upon the arms of a vibrating shaft connected with the valve rod through cams fixed near the ends of the arms, the trips themselves consisting of a variable and adjustable one to move the valves so as to cut off the steam before the end of the piston's stroke, leaving the eduction passage slightly open; a second, to shift the valves a little further, at the end of the stroke, so as to take steam for the new stroke, and open wider the eduction passage; and a third, to shift the valves so as to open the induction and eduction passages to their fullest extent. The two first movements of the valve being made by the movement of the cross head in one direction, and the other by the reverse movement thereof, the last operation being produced by the joint action of the spring cam on the arm, K, and the recessed trip, V, substantially as set forth.

SAWING DOWN TREES—Matthew Ludwig, of Boston, Mass.: I claim attaching the connecting rod, F, to a sleeve, G, which works upon a bar, H, attached to the framing, A, the bar, I, of the saw, J, being attached to the sleeve, G, and the bar, H, having an arm, K, attached to it, which arm has a lever, L, attached, one end of which is provided with a friction roller which bears against the bar, I, and keeps the saw to its work, in consequence of the cord, e, and weight, M, attached to the opposite end. The bar H, being arranged as herein shown, so that it may be turned, and allow the saw, J, to cut in a vertical or horizontal position.

[The above patent is for a tree cutter—a species of mechanism which has long been needed. Without drawings, we could not explain its parts so that they would be properly understood. The intention of the inventor has been to make a sawing apparatus, which should combine cheapness, strength, portability and efficiency, to such a degree that lumbermen and others could conveniently take the machine into the forests and save not only time, but labor and timber, in felling trees and clearing up land. So far as we can judge, Mr. Ludwig has accomplished this object. We look for very favorable results from his invention.]

CONSTRUCTING IRON SHIPS—Otis Tufts, of Boston, Mass.: I claim constructing the hull, decks and bulkheads of ships, with a double shell of iron, inter-fastened, for greatest strength, with binders, substantially as described.

METALLIC BLINDS, FOR DOORS AND WINDOWS—William E. Worthen, of New York, N. Y.: I further state, that certain parts of my invention may be usefully applied out of the connection shown, and I also wish to be distinctly understood that I do not claim as of my invention, a blind made up of slats capable both of rising and falling and of vibrating, except when combined with pivots, etc., as set forth, and also that I lay no claims to raising and vibrating cords or chains, except when attached and located as claimed.

But I claim first, a tubular metallic window blind slat, containing in the cavity thereof a non-conductor of heat, constructed and applied substantially as specified.

Second, I claim pivots and grooves, or their equivalents, applied substantially as set forth, in combination with metallic slats capable of vibration and of rising and falling, by which a firm secure shutter is constituted, while the ordinary uses of inside Venetian blinds are still retained.

Third, I claim a locking bar, substantially such as specified, in combination with slats capable of vibration and motion, in a plane vertical or nearly so.

Fourth, I claim arranging arms to which are attached vibrating chains; and also vibrating chains, as set forth, in a recess separated from the slats proper, substantially as set forth.

And lastly, I claim a supporting chain, as described, in combination with slats capable of vibration and motion, in the manner and for the purposes substantially as specified.

WATER WHEEL—William M. Wheeler, of Upton, Mass.: First, I claim closing the buckets by means of the band or chain in connection with the arms and springs, operating as described.

Second, I claim the guard with its slides, operating in the manner and for the purposes described, or any other substantially the same.

CHURNS—Moses D. Wells, of Morgantown, Va.: I claim the construction of the dasher with an inclined continuous channel, e, substantially as set forth, for producing the upward flow of a continuous hollow column of cream at each down stroke of the dasher, and thus favoring atmospheric action, as specified.

EXCAVATING MACHINE—Edwin Williams, of Covington, Ky.: I do not claim simply an excavating shovel, having an extended handle, capable of longitudinal and vibratory motion, such having been heretofore employed.

But I claim an excavating shovel or scoop, provided with one or more cables, as described, or their equivalents, and having its rear portion or handle hinged to one extremity of a boom, which has longitudinal and vibratory motion about an elevated pinion, or its equivalent, the unattached extremity of said boom being made to counterbalance the scoop, in the acts of dumping, &c., as explained.

GAS BURNING GRIDIRONS—Edwin D. Willard, of Washington D. C.: I do not claim the perforated tubes, nor the corrugated plate.

But I claim the gas burning tubes in combination with a corrugated plate, acted upon by rack and pinion, and moving upon slides, the whole being combined substantially as set forth.

LOOMS—Edward Wood, of Philadelphia, Pa.: I am aware that several combinations of devices are in use, for the purpose of operating an elastic or yielding stopper for the picker of looms, and also for allowing the free motion of shuttle boxes, which are dependent for their action either upon the shuttle itself, or upon the motion of some part of the loom. I therefore do not claim the application of the principle for arresting the picker by a combination of devices arranged so as to make the stopper elastic or yielding to the blow of the shuttle, and allowing the free motion of the shuttle box up and down.

But I claim the rigid or non elastic picker stopper, A, constructed and arranged upon the lay, substantially as described, and operated by means of the rigid link or curved rod, B, or its equivalent, when in connection with the said stopper, A, and the frame of the loom, substantially and for the purposes set forth.

HARVESTERS—David Watson, of Petersburgh, Va.: I do not claim the diagonal arrangement of a series of rotary cutters, or the diagonal cut of a certain portion of one or more rotary cutters.

But I claim the arrangement of a reciprocating cutter or cutters diagonally to the line of motion of the machine, substantially as specified.

LANTERNS—Charles Waters, of Brooklyn, N. Y.: I claim the application of the spring catch, e, and lips, f, substantially as, and for the purposes set forth.

[This patent covers an ingenious spring arrangement for securing the lamp to the bottom of the lantern. It is a very convenient and complete affair. By its use the lamp may be removed from or returned to the lantern, with the utmost facility and safety. Lanterns fitted with this improvement cost no more than those of the ordinary construction, while they are far preferable.]

TURBINE WATER WHEEL—Henry Van De Water, of Troy, N. Y.: I am aware that the French turbine (Jonval's) receives power from the water the same as mine, viz.: first by gravity, and then by suction; the first column operates by the same law as in ordinary wheels. The second part of the column, that is to say, from the bottom of the wheel to the lower part of the fall, would, in ordinary wheels which discharge in the open air, be of no additional effect to the wheel, as the water would leave this point without velocity, and would only fall by its gravity. I do not claim, therefore, placing the wheel, H, within a cylindrical casing, the lower end of which is immersed in the "tail water," underneath the wheel, for that has been previously done.

But I claim first, the employment of the guide or concave conical projection, C, at the lower part of the casing, A, in combination with the cylindrical gate, E, the above parts being constructed and arranged as shown, and for the purpose as set forth.

Second, I claim the chutes or guides, i, placed above the wheel, H, in combination with the slides, j, which form a gate by which the water is admitted in proper quantity upon the wheel, and tangentially thereto, as described.

Third, I claim surrounding the wheel, H, with an annular chamber or recess, g, in combination with the buckets, h, of the wheel, H, when said buckets are formed as shown, viz, with smaller spaces between their lower ends than their upper ends, for the purpose of causing the water to act upward against the lower surfaces of the buckets, and thereby relieve the step of the shaft, D, of the weight of the wheel and said shaft, as shown and described.

[The improvements secured in the above patent were quite recently described and illustrated in our journal—No. 41. If any of our readers would like to acquaint themselves with the principles of what the inventor regards as the latest and best water wheel invention of the day, let them study the engraving and its context to which we have above alluded. We regard the invention as an excellent one.]

SELF-REGULATING WINDMILL—Joseph Dickinson and Oliver White, of Richmond, Ind.: We claim applying to a windmill or motor, a governor or regulator, which shall change the angle of the vanes with the plane of the periphery of the wheel, thus regulating the force of the wind upon them, by the force of the wind or motive power alone, by means of the face plate, F, spring I, rods, G, and cranks, H, or their equivalents, constituting an arrangement effecting the purpose set forth.

KNITTING MACHINES—John Pepper (assignor to the "Franklin Mills.") of Franklin, N. H.: I do not claim a rotary set of rib needles operating in connection with a stationary cam, in the manner as represented and described in Letters Patent granted to me on the fifth day of December, 1854; nor do I claim making the needle stationary, and employing in connection with such a movable set of sinkers or jacks whereby the stitches are formed by the successive movements of the sinkers or jacks between the needles.

But I claim making the plain work needle frame or bar stationary, its needles movable thereon, and to operate in connection with sinkers, or the equivalents, as described, and applying thereto a movable or sliding cam bar, K, or its equivalent, so as to operate the plain work needles in succession, in manner as explained, the advantage of such not only being that no forward movements of the sinkers are necessary in order to bring the loops of the yarn into the hooks of the needles, but that such simplifies the machine, and thereby correspondingly diminishes the cost of its construction.

And in combination with the hooked sinkers and ribbed needles, made to operate substantially as described, I claim the series of cast-off sinkers, or those formed without hooks, the same being arranged in the sinker bar, and not only so as to admit the rib needles to work between the hooked sinkers, but so as to render the machine capable of performing either plain or ribbed work, as specified.

I also claim making the rib needle take the place of the front or hook of the sinker, in forming the loop for the rib stitch.

MACHINERY FOR PREPARING WOOL FOR COMBING—Albert Reinhardt (assignor to Nas. Schlumberger, of Guebeviller, France,) of New York, N. Y.: I claim the combination of the feeding, working and drawing off apparatus, constructed and arranged in the manner set forth, the feeding and drawing off apparatus being so combined as to be alternately brought into action with the working drum, and brought to a state of rest when not in working contact with the drum, all as specified.

DEVICES FOR SEALING PRESERVE CANS—W. H. Elliot, of Plattsburgh, N. Y.: I claim the use of the plug, i, or its equivalent, in sealing exhausted vessels, with or without the tube, j, in connection with the plunger, h, or its equivalent, operating in the manner set forth.

FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim constructing fire arms with a hollow cylinder, A, containing chambers, a a, as described, in connection with barrels, B B, substantially in the manner and for the purposes set forth.

I claim loading the chambers, a a, by foot pedal, G, straps, H H, levers, K K, operating the plungers, M, in combination with the simultaneous capping of the nipples by lever, N, straps, 5 and 6, cross bar, O, and plungers thereon, for removing caps from cylinder, P, and placing them on the nipples, as set forth.

I claim drawing the hammer, T, by lever, R, and bar, S, furnished with spring, W, and catch thereon, or its equivalent, in connection with the angular liberating projection on spring, W, and the liberating post, I5, for the purposes set forth.

I claim drawing the hammer back, in the manner set forth, in combination with the simultaneous swabbing of the discharged chambers, in the manner substantially as described.

I claim likewise the swabbing for containing the swabs, n n, as described, furnished with sponge, or its equivalent, the whole operating substantially in the manner and for the purposes set forth.

FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim the elevating of the manifold fire arm by the screw, F', nut, G', on swiveled arms, a' a', as described, in connection with pulleys, H' and E', chain, K', or their equivalents, substantially as set forth.

I claim the adaptation of the shield to the manifold fire arm, or similar machine, substantially in the manner and for the purpose set forth.

FOR COCKING REPEATING FIRE ARMS—John A. Reynolds, of Elmira, N. Y.: I claim the application of a refrigerator, constructed as described, to the barrel or tubes of fire arms, for the purpose of keeping said tubes from undue heating, substantially in the manner set forth.

TILE MACHINES—Gottlelb Graessle, of Rossville, Ohio: I claim the combination of the two endless chains, corresponding molds, and pressure rollers, formed and constructed substantially as described.

MACHINERY FOR DRESSING TREENAILS—Delia A. Fitzgerald (assignee of Jesse Fitzgerald, through J. Pierce), of New York, N. Y. Patented originally August 26, 1849: I claim the use of the cutters, a, in combination with the enlarging and heading apparatus, or apparatus analagous thereto, when used for the purposes substantially as set forth; and this I claim, whether any one or more of the parts of the enlarging and heading apparatus, or apparatus analagous thereto, are used separately or collectively in combination with the said cutters, whereby treenails are cut and shaped by the use of such mechanical devices as are described.

SHIP'S CAPSTANS—John B. Holmes (assignor to John R. Pratt,) of New York City: I make no claim to employ compound gearing for working capstans, for I am aware that gear wheels have been applied and combined before for the purpose of overcoming a variable resistance in capstans, nor do I claim the shape, form, or construction of the different parts, when separately considered.

But I claim the arrangement of the stationary drum-head, in relation to the stationary base and spindle, and movable body, the same being moved by gearing and cranks, as set forth and described.

[An engraving of this invention will be published next week.]

ALARM BEDSTEAD—J. C. House, of Lowville, N. Y.: Not confining myself to any particular style or pattern of bedsteads, I claim the employment of the tilting frame or bed bottom in combination with a suitable catch or series of catches, connecting it with a clock in such a manner as to be tilted at any required hour by the action of the clock; the whole constructed and arranged substantially as set forth.

RAILROAD CAR COUPLING—A. G. Heckrotte, of New York City: Disclaiming the coupling and uncoupling of cars by eccentric tumbler, revolving roller, turning dog and coupling bar, as secured by the patent granted to W. C. Bussey, 17th July, 1847, I claim the method described of releasing the tumbler by double branched sliding guards, ff', combined with the dog bar, D, whereby the rigid attachment of the box is avoided, and the same rendered capable of attachment to the ordinary spring bumpers, as set forth.

BOTTLE FASTENINGS—Jules Jeannotat, of Paterson, N.J.: I claim forcing or pressing a cushion, H, of india rubber or other suitable material, over or upon the mouth of the bottle, A, by means of a lever, E, inserted in a plate, D, which plate, D, has fianches, F' F, attached to it by rods or links, c.; the plate, D, also having attached to it a plate, G, to which the cushion, H, is secured; the above parts being arranged and applied to the bottle, as shown, for the purpose set forth.

[The above is a contrivance which is attached to the neck of the bottle, near its mouth, for the purpose of holding down the stopper, and thus preventing the entrance of air or the escape of the contents of the vessel. A sort of frame is made to grasp the lip or shoulder at the mouth of the bottle, and there is a pivoted cam placed above, operated by a small lever, so arranged that when the cork is placed over the mouth, the lever may be pressed, and the cam brought firmly down upon the stopper. By lifting the lever, the cam rises and the bottle may be instantly opened. This invention obviates the necessity of wiring, sealing, corkscrewing, and other inconvenient modes of opening and closing bottles. It is a good thing.]

TREBLING A SINGLE STRAND, AND TWISTING SEWING THREAD—Harold Kelsea, of North Branch, N. H.: I do not claim the combination of doubling, twisting, and reeling, mechanism, whereby a strand may be doubled, twisted, and reeled, so as to be made into a skein.

But I claim the combination of the endless band, M, its hitching heads or knobs, N O, and the stationary frame hitching knob, as applied together to the drum rollers and twisting mechanism, and made to operate so as to treble and enchain a strand, substantially as specified.

WIND MILL—J. S. Morgan, of Highland, Ill.: I do not claim, separately, forming the wings or sails in pairs, and connecting the same by pinions, so that the two parts of the sails or wings will move simultaneously towards and from each other, for this has been previously done, but for the purpose only of allowing the sails to close when moving against the wind, and to open when acted upon by the wind, there being no device applied for the purpose of regulating the wings or sails to insure an equal motion of the mill.

I claim connecting the weights, m, to the wings or sails, h, by means of the cords or chains, j j, said wings or sails being arranged in pairs, and connected by pinions, g g, and weights, and cords or chains, arranged substantially as shown and described.

[Mr. Morgan's wind-mill is arranged on the horizontal plan, and is a self-regulator. The wings are hinged in their centers, and fold together backwards, so that, if need be, only their knife edge will be presented to the wind. The greatest power of this mill is when the wings are wide open. The tendency of any pressure of the wind is to close them and so stop the wheel. But this is counteracted by having a compact weight and cord on the end of each wing, which always keeps the wing open until the pressure of the wind exceeds the resistance of the weight. The wings close and open in accordance with the force of the gale, thus preserving, at all times, an equal and steady rotation of the main shaft. There is no limit as to the size and power of these machines. Self-regulating wind mills are rapidly coming into use. Mr. Morgan's improvement we regard as one of merit.

BEDSTEADS—Tyler Howe, of Cambridgeport, Mass.: I claim the described bed bottom, consisting essentially of the slats, E, and the springs, F, constructed and operating in the manner substantially as set forth.

DERRICKS—Edward Mingay, of Boston, Mass.: I claim attaching to a derrick a lever, having its fulcrum in the boom of the same, and actuated by a rope and windlass, substantially as described.

APPARATUS FOR HEATING FEED WATER TO LOCOMOTIVE ENGINES—David Mathew, of Philadelphia, Pa.: I claim the arrangement of the tubular heater, sectional cones, and short exhaust pipes in relation to each other and to the smoke box, as set forth.

MORTISING WINDOW BLINDS—Joseph A. Peabody, of Lowell, Mass.: I claim the bar or carriage, N, which carries the blind stile, and which is moved by lever or otherwise, and the chabgeable and adjustable arms, O O, or their mechanical equivalents, one end of each of them being connected to the bar, N, while their opposite ends are so connected, by pins or otherwise, to the machine that these arms are changeable and adjustable so as to impart any desired angle to the mortises, essentially in the manner and for the purposes set forth.

I also claim the carriage, B, or its equivalent, which may be vibrated or moved by lever or otherwise, for carrying a series of revolving mortising chisels; this carriage, and the chisels attached to it, being so moved that the chisels will form or cut all the angular mortises in one window blind stile at one operation, essentially in the manner and for the purposes set forth.

WRECKING PUMP (ROTARY)—Oliver Palmer, of Buffalo, N. Y.: I claim the combination of the arms, B B, constructed in any equivalent manner, with the spiral partition, L.

ATTACHING METALLIC HEELS TO INDIA-RUBBER SOLES—P. T. Parmelee, of New Brunswick, N. J.: I do not claim the mere insertion of India-rubber within metallic rims or casings, for the purpose of forming the heels of boots and shoes, for that has been previously done.

But I claim having the metallic rims or casings, A, formed with recesses, a, arranged in any proper way, so that the soft or plastic India-rubber, B, mixed with the proper vulcanizing materials, may be fitted therein, and the rubber and rims or casings be permanently locked together by subjecting the rubber to steam heat and vulcanizing it, when fitted within the rims or casings for the purpose as set forth

[The nature of Mr. Parmalee's invention consists in providing an open skeleton boot heel of iron, and filling up the same with vulcanized rubber. Iron heels, filled with common rubber, have long been made, and are good so far as they go. But they soon wear out and become worthless. Vulcanized rubber, on the other hand, will last, we had almost said, forever. To fill the skeleton with vulcanized or hardened rubber, and have it stay fast, is what many have essayed but never accomplished. Mr. Parmalee's plan is to place common molten rubber into the skeleton, and then introduced the vulcanizing substances—sulphur and other ingredients—the skeleton and contents being subjected to steam heat during the process. The skeleton is, of course, beveled, or has projections inside to assist in retaining the rubber. The old fashioned "iro nheels" will now have to step aside. It is a good improvement.]

ADDITIONAL IMPROVEMENT.

SCREW WRENCHES—Lorenzo D. Gilman, of Troy, N. Y. Original Patent, March 27, 1855: I claim adding the tube, E, with the nut, G, surrounding the rod, C, of the movable jaw, to the arrangement of the adjustable toothed plate with springs, the toothed shank, and the eccentric with its strap attached to the toothed plate, as set forth.

RE-ISSUES.

COTTON PRESSES—Cyrus J. Fay, of North Lincoln, Me. Patented originally Jan. 31, 1854: I claim first, the use of the slats or guide strips, E, arranged and operating in the manner substantially as set forth.

Second, I claim the tenons upon the transverse bars of the doors, which, entering mortises in the frame-work, relieve the hinges from the strain which would otherwise come upon them.

Third, I claim hinging the doors of the press, in the manner described, to prevent them from violently bursting open, when the bar which confines is removed.

Administration of the New British Patent Law.

The London *Mining Journal*, in reference to the administration of the new Patent Law, contains the following keen sarcasm:

"God sent food, and the devil cooks."—Legislative wisdom is *supposed* to produce Acts of Parliament, but Governmental Incapacity most assuredly administers them; and although this, like other public journals, is scarcely ever without some complaint of the conduct of our government departments, yet we know of no case where their ill-regulated character is more apparent than in the administration of the new Patent Act, in which we, as promoters of the reform of the Patent Law, feel especial interest, knowing, moreover, that the efficient working of the Patent Law is a matter affecting many of our readers.

Transcendently objectionable, however, is the practice pursued with regard to special applications to the Lord Chancellor for extension of the time to seal and specify letters patent in cases where those legal processes have been delayed by accident, such application being almost always answered unfavorably, by an endorsement of "No order," unless the party make application by counsel in open court (at considerable expense;) in which case, petitions previously so answered having been at first placed in the hands of the Clerk of the patents, to be laid before the Lord Chancellor, have been afterwards favorably answered by his lordship in court. In fact, the whole practice of the Government Patent Office seems to be intended to defeat the professed object of the Act of Parliament (except as regards the department administered by Mr. B. Woodcroft which is admirably conducted.)

Heat Without Fuel.

MM. Beaumont and Mayer have made a machine which may be seen at work at their establishment on the Quai Valmy, in Paris; it contains 400 litres of water, which is made to boil in two hours. A cone of wood which turns in a cylinder, so as to produce the necessary friction, is covered with tow, and that tow, in order that it may not catch fire, is kept constantly moistened by a stream of oil which runs on it. The heat gradually increases, until at last steam is generated.—[Exchange.

The same thing was accomplished in this city about four years ago, but it is a worse than useless invention, as it will require just as much fuel to work the machine to produce friction to make the water boil, as it does to apply the fuel direct to boil the water. Count Rumford boiled water by friction more than half a century ago.

A locomotive exploded on the Vermont Central Railroad, on the 10th inst. The engineer, fireman, and conductor, were killed. This case should receive a severe investigation.

(For the Scientific American.)

Sir John Franklin and Dr. Kane—A Spiritual Communication.

I have, since the commencement of the present volume of your valuable journal, met with several articles on Spiritualism, which somewhat awakened in me an interest in the matter. One article, in which you said there was something strange and unaccountable about it, particularly attracted my attention, and as I am of a very inquisitive nature, I concluded directly to investigate the matter to find out whether it was an "elephant" or a "humbug," or what else it might be. I accordingly visited a "medium" of this city to see the "elephant," or the "humbug," as I till then thought it was; but I can give you my oath upon it, that I neither saw the elephant nor the humbug. I saw things that I would have doubted if even "Uncle Sam" himself had sworn to them as truths, for I nearly doubted my own senses the next day.

As I was informed, however, on this first visit, that I was a medium myself, I was determined to see more of these wonderful things, that I might be perfectly sure that what I had seen was truth and reality, and I consequently attended the circle of the above-mentioned medium regularly, until I succeeded in forming a circle of my own, which enabled me to give the subject a still closer examination.

On the first and second meeting of my circle nothing but some very powerful physical manifestations, and the names of a few deceased relatives, were received. Upon the third meeting, however, (which was on the 23rd of June last) the following communication, purported to come directly from the Spirits of Eternity, was received, accompanied by the positive order that I should write it to you and ask you to publish it in the SCIENTIFIC AMERICAN. The communication, as you will perceive, relates to Sir John Franklin and Dr. Kane, as follows:

"Sir John Franklin is not in the Spiritual world, he still lives upon the earth with seven more of his original party, and two of his ships. He has been locked up in the North Polar Sea, but has at last found a way through the icy walls again that imprisoned him so long, and he is now safe and well in Buffalo Bay, between 60 and 70° north latitude nearest the Greenland shore.

Dr. Kane has lost about thirty of his men, and is at present near Sir John Franklin. He will soon meet him, and return with him to New York,—a triumph and pride to every truly American heart. . . . ."

Here the communication stopped, but was resumed at the next meeting, which took place on Thursday the 28th of June, as follows:

" . . To-day a terrible storm rages in the arctic regions. It has brought Sir John Franklin and Dr. Kane in sight of one another. They have espied, signalized, and recognised one another, but have been again separated by the storm. Dr. Kane is furthest north: one of his men was washed overboard in the storm, but again taken up, though in a bad state of health.

Sir John Franklin has been directly upon the North Pole of the earth, and has, during his long residence in the arctic regions made wonderful and interesting discoveries and observations that were never known before. Lt. Maury and Dr. Kane are very nearly right in their opinion of the North Polar Sea, as Sir John Franklin will testify when he arrives."

. . . . . .

Here the communication again stopped, with the promise, however, that I would be informed of any particular incidents happening to both parties until they arrived at New York.

I have received several other communications of scientific interest, but as I was particularly ordered by the spirits to send you the above as quick as possible, I will leave them for some future occasion, and only mention in conclusion, that I cannot yet perfectly believe in spiritual intercourse, although there is no power in nature, that I know of which can or will account for such phenomena (called spiritual manifestations,) as I have witnessed since I commenced examining the subject. If, however, the future will prove the above, and some other communications, to be facts, I think I shall then be obliged to be a strong and unwavering Spiritualist, for then it will be to myself, as well as other persons present at the time, a positive evidence, beyond a shadow of doubt, that the communications came from the source they purport to.

G. L. W.

Baltimore, July 10, 1855.

[Our correspondent states that if this spiritual communication proves correct he will be compelled to become an unwavering spiritualist. We assure him that his spiritual informant must be an awful ignorant fellow to tell him that Dr. Kane had lost thirty of his men, when the whole expedition numbered only seventeen persons, as follows:

Dr. Elisha K. Kane, Commander; J. Wall Wilson, Sailing Master; Henry Brooks, First Officer; James McGary, 2nd officer; Amos Bonsall, 3rd officer; Dr. J. J. Hayes, Surgeon; Christian Ohlsen, carpenter; August Sontag, astronomer; Henry Goodfellow, assistant astronomer; William Morton, steward; Peter Shepherd cook; Geo. Stephenson, J. T. Parker, Geo. J. Whittel, Wm. E. Godfrey, Geo. Reilley, and C. Blake, seamen.

After losing thirteen more men than comprised the whole expedition, according to the spiritual letter, it is really refreshing to find that Dr. Kane has still some more left.

The above communication is about on a par with all the others we have read purporting to come from the spirit world, through the modern medium system.

The New England *Spiritualist* puts on record a *test* communication received from the spirit-world, on the 30th, two days after the above, and on the same subject. It says:

"Dr. Kane has recently passed away from the earth life; his mortal body having been crushed by the ice, as he went after his crew who had gone in search of land. His ships had been broken to pieces and destroyed, and most, if not all of his crew are in the spirit-world. The spirit also stated that he in company with Dr. Kane, Sir John Franklin and others, was last night in the polar regions, and saw the remains of Dr. Kane upon the ice, with clothes, papers, and his watch, upon which they saw his name, 'Dr. Kane,' he having engraved it thereon, not expecting to escape, but hoped that it might possibly be found by some one in search of him."

It will be seen that this completely contradicts the above letter: the one says that Sir John Franklin and Dr. Kane are alive, and will soon arrive in New York; the other says they are both dead. "Oh, tantalizing spirits!"

Induced Electricity—New Developments.

In a recent lecture, at the Royal Institution, London, Prof. Faraday explained the action of Ruhmkorff's apparatus, by which the effects of induced electricity are most strikingly exhibited. Mr. Ruhmkorff is a philosophical instrument maker at Paris, who has contrived, by the application of well known principles, and by a new combination and enlargement of the induction coil, to produce from voltaic electricity some of the beautiful effects of the electricity excited by the most powerful machines; and thus to show most clearly the identity of the force excited by friction and by chemical action. The apparatus consists of a primary coil of copper wire, round which there is wound a large quantity of finer covered wire; and by sending a voltaic current through the first coil, electricity is induced in the second, though no portion of the voltaic current passes through it. This "secondary current," as it is called, possesses an intensity resembling that excited by the electrical machine. The induction of an intensity current in a second wire was discovered 20 years ago by Prof. Faraday, who exhibited on the lecture table the original apparatus by means of which that effect was produced. The induced electricity perceived on making contact with the voltaic battery is of the opposite kind to that excited on breaking contact, and Prof. Faraday stated that the cause of there being no observable effect excepting at the moments of making and breaking contact, was that the two opposing currents being equal in force, they neutralised each other. By a mechanical arrangement, which those who are acquainted with a common medical coil apparatus will understand, the contact is made and broken automatically with immense rapidity, and by this means the two electricities of the secondary current are separately brought into action. Ruhmkorff's apparatus is indeed liltle more than a greatly enlarged medical coil machine. The flood of electricity developed by this apparatus was exhibited in many beautiful experiments. When a jar, coated inside with tinfoil, was placed within the exhausted receiver of an air-pump, and one end of the second wire was connected with the inside of the jar and the other end with the metal plate of the pump, there was a copious outpouring of purple light from the interior of the jar, accompanied by concentrated electric flashes, which varied in intensity as the strength of the voltaic battery was increased or diminished. Another remarkable exhibition of this condition of electric force was its passage in a succession of sparks between the ends of two wires. The sparks succeeded each other so rapidly as to be not separately distinguishable when the wires were stationary, but on moving them about each spark was distinctly visible; the optical effect, in consequence of the short duration of the electric spark, being the reverse of that when a continuous light is in motion. Various modifications of Ruhmkorff's coil have been made by Mr. Grove and others, to increase its intensity effects, and to make the kind of electricity evolved approach still more closely to that excited by friction. In one of the arrangements shown by Prof. Faraday, in which the secondary wire was connected with the interior of a Leyden jar, the positive and negative electricities of the secondary current were exhibited separately, and producing different effects; one being intensified by passing through the jar, and the other being in its ordinary condition. The sparks emitted by the intensified current were much more brilliant, and made a louder sound than the other, and the actions of the two currents were also different; for the former pierced holes through paper, whilst the latter set the paper on fire, and the ordinary current ignited gunpowder, which the other merely threw aside. Prof. Faraday observed, in conclusion, that the extraordinary phenomena exhibited by Ruhmkorff's apparatus opened new fields for discovery, which, if he were a younger man, he should have eagerly investigated, and he trusted that others who had their minds directed to the subject would be able to elicit by the observation of those phenomena many important truths in electric science.

Precipitating Metals from the Human System by Galvanism.

We have seen accounts, in a number of our exchanges, of a discovery recently made in Paris, whereby mercury, lead and arsenic had been extracted from the human system by an electric current, the patient having been set in a bath during the operation. The editor of the *Columbus* (Ohio) *Journal* also states that he lately witnessed the same operation successfully performed on Jacob Hymrod, of that place, by Drs. Youman and Seltzer, but he describes the operation so unscientifically, that we must say the effects could not be produced as he has described them. The first, to our knowledge, who applied the galvanic fluid to extract metals from the human system, was Prof. Vergnes, of this city, whose electro-magnetic engine was illustrated on page 184, vol. 9, SCIENTIFIC AMERICAN, and who has contributed some very profound articles on electro-magnetism to our columns. He extracted silver from his own system, by the galvanic pile, in 1852, he having seriously injured his hands by the use of the nitrate of silver, in gilding by the electrotype process.

The past week has been the hottest of the season: during four days the thermometer rose as high as 94° in the shade. Prof. Merriam, of Brooklyn, sets it down as a very "Hot Term."