

NEW BOOKS AND PUBLICATIONS.

FLOW OF WATER IN RIVERS AND CANALS. By D. Farrand Henry, Chief Engineer of the Detroit Water Works. Detroit: W. C. Graham, 52 Bates Street.

This is an able treatise on a very difficult and interesting subject; and, written as it is by a competent authority, must be considered as an important contribution to our knowledge of hydrostatics. It was originally published in the *Journal of the Franklin Institute*.

THE AMERICAN NEWSPAPER DIRECTORY: containing accurate Lists of all the Newspapers and Periodicals published in the United States and Territories, and the Dominion of Canada and British Colonies of North America. New York: George P. Rowell & Co., 41 Park Row.

This valuable compilation is here issued in a new edition, and the information is carried down to the latest date, with the elaboration and accuracy for which the work is justly renowned.

THE COAL REGIONS OF AMERICA; their Topography, Geology, and Development. With Maps and Illustrations. By James Macfarlane, A.M. New York: D. Appleton & Co., 549 and 551 Broadway.

The coal supply of the world is now a most vital question, and the enormous deposits known to exist in our country have long drawn the attention of practical scientists to the best means of raising and making available for public use this indispensable commodity. Mr. Macfarlane's book is a collection of all the ascertained facts as to the geographical, topographical, geological, and other characteristics of the coal regions of the United States, and the commercial and economical relations of this immense wealth, classified for study and reference. We believe this work will be eminently useful to all interested in the question, and we recommend it as a trustworthy authority.

UNDERGROUND; OR LIFE BELOW THE SURFACE. By Thomas W. Knox, Author of "Camp Fire and Cotton Field," etc., etc. Hartford: J. B. Burr and Hyde. Chicago: J. B. Burr, Hyde & Co.

Under this attractive title, the author has collated much curious information concerning mines, caverns, borings, shafts, tunnels, diving and divers, volcanoes, prisons and dungeons, cellars, sewers, underground railroads, rapid transit and many kindred topics. It forms a book of light and entertaining reading, containing many remarkable and little known facts.

BURNS' PHONIC SHORTHAND, for Schools, Business and Reporting. By Eliza Boardman Burns. Published and for sale by Burns & Co., Phonographic Publishers, 33 Park Row, New York. Price \$1.

Mrs. Burns, in the neatly printed volume above named, aims to supply to the public a work which shall be in every respect a self instructor. To this end, she has brought her long experience as a teacher of the art of phonography to bear in its preparation, and, by an excellent arrangement of printed keys to every page, careful and lucid explanation of the fundamental rules, and a judicious selection of examples, has produced a book which will doubtless prove of great service. We may add here that the recent introduction of the postal card renders phonography a science which may be called even into greater practical utility than at present. On the back of one of the ordinary cards, a letter of considerable extent may be inscribed in phonographic symbols, thus not only saving postage, but preventing the perusal of its contents by the general public. For business and other large correspondence, phonography is a most valuable auxiliary, and any means which, like the volume under notice, has for its object the popularization of the science will be generally welcomed.

A CATALOGUE OF EIGHTY-ONE DOUBLE STARS. By S. W. Burnham, Chicago, Ill.

Mr. Burnham here gives the result of investigations by which he has succeeded in discovering 81 double stars, which are not noted as double in any former publications. The list, valuable indicating the progress of astronomy in America, was published in the March issue of the *Monthly Notices of the Royal Astronomical Society of England*. Eighty of these double stars were discovered with a six inch Alvan Clark refractor.

REPORT ON A TOPOGRAPHICAL SURVEY OF THE ADIRONDACK WILDERNESS OF NEW YORK. By Verplanck Colvin. Albany: The Argus Company.

This report describes the work done under authority of the Legislature of the State of New York; and it contains much new, valuable and interesting information. Among many discoveries, we especially notice the fact that Whiteface Mountain, hitherto considered to rise to only 2,500 feet above the sea level, and consequently to be inferior to the highest of the Catskill peaks, is really 1,000 feet above those elevations. Mount Marcy, the center of the Adirondack range and the highest mountain in the State, is here correctly located, for the first time.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]
From May 31 to June 5, 1873, inclusive.

- COLLAR AND CLASP.—A. Flatley, J. Marson, Brooklyn, N. Y.
- CUTTING STONE.—G. Stacy, Nannet, N. Y.
- ELECTRO-MAGNETIC ENGINE.—J. D. Wallace, New York city.
- MAKING BOOT SOLES.—D. Mills, Brooklyn, N. Y.
- MAKING WRITING INK.—J. W. Carter, Boston, Mass.
- SAFETY VALVE BALANCE.—V. F. Lassoe, G. F. Meyer, Brooklyn, N. Y.
- SEWING MACHINE TUCKER.—E. Bouillon, New Orleans, La.
- SHEEP SHEARS.—A. S. McWilliams, Colusa, Cal.
- STEAM ENGINE GOVERNOR.—J. M. Bottum, New York city.

Recent American and Foreign Patents.

Improved Cartridge Box.

Samuel McKeever, U. S. Army, Mobile, Ala.—This invention relates to the construction of that class of cartridge boxes which are made in two parts hinged together. The invention consists in making one part higher than the other so as to fold over at top and allow it to be latched; in a flexible connection and pivot rod across the middle to enable it to unfold easily and smoothly; and in putting the flap and button at the bottom of the box.

Improved Sewing Machine.

Friedrich Koch and Robert Brass, Brooklyn, assignors to John Boyle, New York city.—This invention consists in the improvement of sewing machines for heavy fabrics. An elbow lever is pivoted to a slotted block confined in a recess of the head piece. The presser shank passes through this block, and a gib is placed between the shank of the presser and the short arm of the elbow piece that also projects into the block. When the awl is about to penetrate the material its cam strikes a roller, turns the elbow, and through the gib and block the presser is held firmly in position, so that it cannot rise under the action of the awl. A combination of motions causes the awl to ascend through the throat plate, pierce the fabric held there by pressure foot, feed the same to the descending needle, which follows the receding awl and enters the hole from above, carrying the burr toward the interior of the fabric, producing an even surface.

Improved Cartridge Box.

Samuel McKeever, U. S. Army, Mobile, Ala.—This invention relates to the construction and arrangement of the parts which constitute a soldier's cartridge box. It consists in making the box in two parts that are pivoted together at the bottom so as to turn down and allow an important addition to the number of cartridges usually carried. It also consists in providing the movable part with a rigid cover and in making slots where this turns on the pivots of the other, so that it may be raised and lowered to bring the cover in place and admit of dispensing with the ordinary flap cover. It also consists in a novel mode of securing the pockets to the inside of boxes so that the cartridges can be placed in a convenient position for rapid removal by the soldier.

Improved Sewing Machine.

Eugene W. Beebe, Evansville, Wis.—This invention consists in the improvement of sewing machine feed mechanism. The feed plate is secured to one end of a crooked bar hinged to the plate, by which the forward and back motion is imparted to the feed plate through a lever, one end of which works between a stationary lug on said plate and a movable one. A vertical bar is pivoted at its lower end to a stand under the bar, and has a roller in its upper end on which the bar rests. It is connected by a rod with the lever, so that, at the time that said lever works the plate, it will work the bar. The bar swings with the lever the full measure of its movement and raises the feed plate, while the plate only moves a short distance. The bar is curved downward so that it will raise the feed plate up to the cloth just before the lever comes to the lug, so that when the plate is moved forward, after the lever strikes this lug, the plate will move the cloth; then, during the back movement of the lever and before it comes up to the lug to move the feed plate back, it will pull the bar and roller back along the curve, so as to let the feed plate fall away from the cloth. The length of the stitch is regulated by moving the adjusting lug along the plate with an adjustable screw.

Improved Wagon Brake Shoe.

Henry Seitz, Palmyra, Mo.—This invention has for its object to furnish an improved brake shoe, which shall be so constructed that it may be readily moved up as it is worn away by the friction of the wheel, and which may also be moved laterally to bring it into line with the rim of the wheel.

Improved Chandelier.

Joseph Kintz, West Meriden, assignor to Joseph Kintz, of Meriden, and P. J. Clark, of West Meriden, Conn.—The essential object of this invention is so to make a chandelier that the center and suspending rod can be trimmed permanently without putting the arms in place, to facilitate the packing for shipment, and so that when received by the purchaser the arms can be readily put in without disturbing the ornaments to any material extent. The invention consists of a hollow center piece, to which the arms are attached, made of a ring and a bottom and top of a cup-shaped form, which are screwed against the ring by nuts on the rod, and have flanges overlapping the edges to hold it in place. The arms are hooked to the top of the ring and confined by the flanges of the top and bottom parts. The top part is swiveled to a female nut, which is a part of the ornamental piece above the center, by which it is readily raised up from the ring to admit the hooks of the arms for attaching them, and then screwed down again to secure them. The rings connected to the suspending rod by bars projecting from the rod radially, to prevent turning.

Improved Case for Law Books.

C. Irvine Walker, Charleston, S. C.—The object of this invention is to furnish to lawyers, clerks of courts, notaries public, and others a law book case, which contains a number of leaves for the adjustment of different law books, to be available for ready use, and provided with an index for easy reference. The books or forms are thus preserved in good order, free from injury, and by their convenient arrangement a great deal of time is saved. The invention consists of a book composed of leaves of binders' boards, or wood, metal, or other suitable material. On each side, or on one side only, of the leaves, at the corners, are strips for confining the blanks and for holding them flat against the leaf. The strips are placed diagonally across the corners and so prevent any slipping of the blanks. They are stamped in such a manner that the parts which pass over the blanks are bent up suitably so as to form an elevation for slipping the blanks under them; and they hold the blanks firmly in their place, keep them flat, smooth and clean, and make them easy of access. The lettering (or numbering) of the pages, with an index sheet in front, makes it an easy matter to find any blank which may be wanted. It is a most convenient arrangement for lawyers, court officers, and others keeping blank forms, and is far preferable to shelves, as it is more compact, and can be laid on the desk or table immediately at hand.

Improved Reversible Street Car.

William T. Jenks, Toledo, Ohio.—This invention has for its object to improve the construction of the improved street car, for which letters patent No. 135,277 were issued to the same inventor January 28, 1873, so as to make it more convenient in use and more effective in operation. The invention consists in the circle, constructed as described, the flanged segments, the rollers, and the guard, in combination with the car body, the truck frame, and the king bolt. By means of the king bolt the car body is pivoted to the truck frame, and the former is long, so as to allow the body to rise above the frame without drawing the bolt out of place. A guard brace is attached to the truck frame to hold the said bolt steady and in a vertical position while the body is being raised, turned, and lowered. A circle, the parts of which toward the sides of the car body are horizontal, is attached to the said car body. The parts of the circle toward the ends of the car body are also horizontal, and are at a lower level, so as, when the car body is parallel with the truck frame, to rest upon the central bar of said frame. Segments of circles are formed with side flanges upon their outer and inner edges, and are bolted through their outer flanges to the bars of the truck frame. In slots in the end parts of the segments are pivoted rollers, upon the faces of which the inclined parts of the circle rest. By this construction, as the car body is turned, the circle moves up upon the rollers, raising the car body above the wheels so that the said body can be conveniently turned; and as it comes into line in the reversed position, it again descends to its former level.

Improved Cotton Worm Destroyer.

Jack Helm, Hochheim, Texas, assignor to himself and Charles Tim, of same place.—This invention relates to a new machine for removing the destructive cotton worms from the cotton plants without injury to the plants and for destroying the worms. The invention consists in the arrangement of a movable frame, which is by animals drawn over the fields to straddle the rows of cotton, and which is provided with brushes for sweeping the worms from the plants, and with jointed bottom pieces or slides, which crush them on the ground.

Improved Dental Drill.

Jonathan W. Baxter, Vevay, Ind.—This invention has for its object to furnish dentists with a rotary drill adapted to be operated by the hand through the medium of a worm, a toothed driving wheel, and pawl mechanism. The wheel is turned by a pawl crank and a push pawl, the latter extending down through the bottom of the case, and having a finger piece on the lower end to be acted on by the middle finger of the same hand by which the machine is held, which pushes it up and turns the wheel, and a spring pushes it down again.

Improved Milk Boiler Alarm.

Samuel Mangold, New York city.—The object of this invention is to prevent boiling milk from becoming scorched by boiling over; and the invention consists in forming a milk boiler alarm which, when the milk is about to boil over, will cause a bell to ring, so that the cook may be informed and remove the milk from the fire. This invention is carried into effect by the use of a float, connecting with an elevated bell in such manner that, when the boiling milk rises to the top of the float and enters or weights it, the bell will be released and ring the alarm.

Improved Harrow.

Thomas M. King, Murfreesborough, Tenn.—This invention consists of two harrows, the frame of each being formed of a straight bar and a semi-circular bar, and attached to a beam by bolts, so as to be adjustable at various angles to each other.

Improved Mechanism for Operating Screw Propellers.

James Wixcoxon, Russellville, Ill.—This invention consists of twin screws and propellers, each mounted on a laterally vibrating frame, where-with is a horizontal drive wheel on a vertical axis, coinciding with the axis whereon the frame swings, and gearing with the propeller shaft so that the propeller and the rudder can swing laterally to utilize both the propeller and the rudder for steering the boat, the said drive wheel being also geared with the crankshaft in the vessel for being operated. Twin screws and rudders are used, to have one counteract the other in respect to the tendency of the drive wheel to cause the propeller and rudder to swing around their axis in the application of the driving force. The two vibrating frames are connected together so as to act synchronously, and the chains of the steering wheel are connected to them to work them to steer the boat.

Improved Nut and Coffee Roaster.

D'Alembert T. Gale, Fort Wayne, Ind.—This invention consists in the arrangement, in connection with a nut-roasting cylinder, of an escapement wheel, clutch, pawls, and pendulum, in connection with a spring-driving mechanism, whereby an intermittent rotary motion is given to the roasting cylinder: the mechanism being so constructed and arranged in relation to the roasting cylinder that, in winding up the springs which constitute the motor, the roasting cylinder is revolved the reverse way, thereby giving the contents thereof a thorough mixing, avoiding burning.

Improved Combined Stop Cock and Check Valve.

Asa T. Waldron, Waterford, N. Y.—This invention consists of a combined stop cock and check valve, in which the water way of the hollow cock is divided by a partition with a hole through it, and a valve seat on the upper side, with a stem extending up into a hollow removable cap on the top of the cock, and having a coiled spring for closing it down on the seat, the partition being above the inlet port, so that the check valve prevents back flow. The construction is such that the check valve can be readily taken out at any time by removing the cap on the top of the cock to clean out sand and other matters collecting in the plug.

Improved Shaft Coupling for Earth Augers.

Thomas Urie, Corning, Iowa.—This invention has for its object to furnish an improved shaft coupling for well borers and other machinery. The shaft is made square, and in sections or lengths. Upon the lower end of the lower section is attached a boring tool. In each end of each section or length of the shaft is formed a tapering square hole or socket to receive the coupling pin, which is made square in its cross section, and tapering from its center toward each end, to correspond with and fit snugly into the holes or sockets in the ends of the sections of the shafts, where it is secured in place by set screws. This construction leaves the surface of the shaft smooth throughout its entire length.

Improved Filter for Water Cooler.

Charles Schneider, Newark, N. J.—The object of this invention is to provide an efficient filter for water coolers, by which not only the impurities contained in the ice may be excluded, but also impure and unhealthy pump or aqueduct water filtered in such a manner that the clear and limpid liquid is drawn off. The whole filter is constructed to be detachable for cleaning and refilling with charcoal or other absorbing material, as required. The invention consists of a cylindrical filter of wire gauze, having a detachable top and adjustable bottom. A conical spout, to be placed into the inside of the faucet of the cooler, closes the faucet and prevents thereby the escape of unfiltered water.

Improved Railroad Switch Signal.

John Cullen, Oxford, Miss.—The object of this invention is to improve the signals of railroad switches so as to insure greater safety in running the trains; and it consists in connecting, with the signal levers, reflectors by which the head light of an approaching locomotive will be reflected and the position of the signal indicated to the engineer. To warn the engineer of danger ahead, a reflector may be placed on the rear car of a train ahead, which it is believed would be an improvement upon the signal lantern now in use.

Improved Bed Bottom.

Nelson O. Wilcox, Omaha, Neb.—The object of this invention is to simplify, cheapen, and, at the same time, improve spring bed bottoms. Cleats at the end of the bedstead support spring slats. Cross pieces rest on the spring slats and support the middle slats. The spring slat is made in three pieces, with a supporting slat beneath. The pieces are connected by means of elastic bands made of rubber or equivalent material. The cross pieces are notched to the spring slats, and the middle slats are notched on to the cross piece. The spring slats are placed next the sides of the bedstead, and with this arrangement of the parts the middle slats are made to partake of the elasticity of the spring slats, and the whole to form a highly elastic and durable bed bottom, without the use of metallic springs or metallic fastenings.

Improved Horse Power.

Washington P. Emerson, Pleasantville, Ky.—This invention consists of a series of vertical shafts arranged in a circle with pulleys at the lower end, all in the same horizontal plane, in which the driving belt works. The horse is hitched to a belt working on pulleys. The upper ends have transmitting pulleys in different trains, from which the belts work on a central vertical shaft, which is speeded up and transmits the motion by a belt from a large pulley.

Improved Cultivator.

William T. Walker, Fontenoy Mills, Ga.—This invention consists in the arrangement of springs with the pivoted and stationary beams of a cultivator. The springs are secured to the fixed central beam and connected at their free ends with the pivoted and handled side beams by means of staples or other equivalent guides. By this construction, by operating the handles the side plows may be moved inward or outward, as may be desired, and together or separately, as may be required.

Improvement in Preparing and Packing Water Colors.

Edward L. Molineux, Brooklyn, N. Y.—In preparing these improved colors, sheets of cardboard or other substance, properly prepared in any of the well known ways to prevent them from absorbing the colors, are painted with one or several coats of color in a damp state, prepared with sufficient sizing. As the coats of color dry, other coats are added until a mass of color of the desired thickness has been formed. The sheets thus prepared are carefully dried, and cut into pieces of any desired size and form. The sheets, pieces, or tablets of color are then made into portfolios, albums, pocket books, or other convenient forms. In using these tablets the amount of color required is rubbed off with a brush moistened with water, thus dispensing with the use of slabs or tiles for grinding or rubbing the cake colors.

Improved Hay and Cotton Press.

William H. McBurney, Sacramento City, Cal.—This invention consists in an improvement of the operative mechanism for hay and cotton presses. A pair of long levers are pivoted at one end to strong posts near their upper ends, the said posts rising up from the platform a suitable distance from the front of the case. At the other ends said levers project through slots in the front of the case, and are connected by short links with the under side of the follower. These levers have a bar pivoted to them, the said bars being pivoted to the free ends of other levers, which at their other ends are pivoted to the platform and also to the bars. These latter bars are pivoted to the axis of the upper wheel of a pair of eccentric segmental wheels, arranged between posts so that the said axis and a strong block above are caused to rise by the turning of the lower wheel to force up the follower. By the short movement of the upper wheel, due to the eccentricity of its face and that of the lower wheel whereon it rests, a long movement is imparted to the follower in consequence of the arrangement of the levers and the connections; and in the last part of the operation when the resistance has greatly increased, a considerable measure of the power is transmitted through toggle-jointed bars, by which the leverage is so increased that the greatest force is obtained at the time it is most needed.

Improvement in Rolling Wire.

William Walton and John T. Fallows, Houghton Dale Mills, Denton, near Manchester, England.—This invention consists, first, in rolling two wires, round or otherwise, in the same groove, or in recesses formed in the circumferences of rollers, in order to produce at one operation two wires of the required section, angle, or other form. The invention consists, also, in making grooves or recesses of an angular or curved form in the circumference of one or both of the compressing rollers, the section of the grooves or recesses corresponding to the shape of the two angle irons required, so that, when the wires are compressed in passing between the rollers, each assumes the shape of half of the groove or recess. These rolled wires are particularly adapted for making wire cards, but they may be used for other purposes.

Improved Row Lock.

George C. Wilen, Philadelphia, Pa.—This invention consists in a bracket or ball hinged to the rail, or, rather, to a plate through which the row lock passes, so that the row lock is supported by two bearings instead of one and is kept steady and in working order.

Improved Refrigerator and Mode of Cooling.

Jacob F. Schneider, Brooklyn, N. Y., assignor to himself and Phillip Lenthart, of same place.—The object of this invention is to furnish to the public an improved refrigerator which cools and preserves the articles placed therein without the use of ice. The invention is based on the principle of reduction of temperature by evaporation of liquids; and consists mainly in the application of very porous plates placed in vessels filled with the liquid to be evaporated, and arranged at the sides and tops of the refrigerator. The liquid will gradually rise in the plates, and, being exposed by the porosity of the plates to rapid evaporation, will reduce the temperature in the inside of the box. The porous plates are connected, by strips, to the sides of the refrigerator. The lower parts of the plates are placed in boxes of suitable metal. The liquid used is preferably water, with a small addition of salt and salt-peter for decreasing the temperature and purifying the air. The porous plates are obtained by the mixture of clay, sand, sawdust, charcoal, pulverized glass, and a slight addition of sulphur. On forming and burning this composition, very porous plates are obtained, in which the liquid rises rapidly, which is necessary for this purpose.

Improved Revolving Rake Shoe.

Almerin J. Taylor, Rome, Pa.—This invention consists in securing the two sections of a rake shoe detachably, so as to bring the fulcrum directly under the rake head. The shoe is made in two parts, exactly alike, about eighteen inches in length, which are beveled off at one end for about six or seven inches. The parts are placed upon each other, long side to long side, with their beveled ends pointing in opposite directions, and are securely bolted together. In the adjacent edges are formed half round notches, which, when the said parts of the shoe are bolted together, form a round hole to receive and fit upon the rounded middle part of the rake head. The fulcrum is brought directly under the rake head. By this construction, as the rake is revolved to dump the hay, the other side of the shoe will come in contact with and will slide along the surface of the ground.

Improved Driving Rein Support.

Wm. W. C. Willson, Summit Point, West Va.—This invention relates to means for preventing the usually annoying practice, which belongs to all draft quadrupeds, of switching the reins out of their proper position and clamping them under their caudal extremities.

Improved Farm Gate.

Horace W. Mullenex, Alpine, N. Y.—This invention relates to gates which both turn and slide, and consists in the improved construction of the frame in which they slide. The gate when hung in the swiveled frames can be half opened, or more or less than half opened, by sliding it on the frames, and can then, or in any position on said frames, be turned and fastened at either end to the gate post.

Improved Spinning Mule.

John J. Dewey, Queechee, Vt.—This invention consists of a combination, with the carriage of a spinning mule, of gearing, arranged for facilitating the running of the carriage in by hand (first throwing off the driving belt and turning the spindles slowly) when the bobbins are full and ready to be doffed, so that the yarn may be wound a few times around the bottoms of the bobbins to fasten it, and then run down below the bobbins on to the spindles, so as to be held, when the bobbins are doffed, ready to be run upon the new bobbins. By this means it is possible to wind, upon the spindles, the packing of fine threads for holding the bobbins thereto by friction.

Improvement in Dyeing Madder Colors.

Frederick A. Gatty, Accrington, England.—These improvements apply to cotton fabrics and yarns printed, padded, or otherwise prepared with aluminum mordants for dyeing red colors with madder, garancine, extracts of madder, artificial alizarine, or other products of madder. In place of using cow dung, or any known dung substitute, for the operation commonly called dunging or cleansing, solutions of soap or solutions of fatty acids or resins are employed, combined with soda, potash, or ammonia, or their respective carbonates, or emulsions of oils, or the waste soap liquors of calico printers and Turkey red dyers. The object of using the ingredients named above in lieu of cow dung or dung substitutes is to combine a certain quantity of fatty resinous matter with the mordant in order to obtain brighter colors. By these means red colors similar to Turkey red are obtained without going through the tedious and expensive process of oiling.

Improved Puddling Furnace.

John Heatley, Harrisburgh, Pa.—This invention consists in a stove, placed in the center of melting chamber, and provided with inlet and outlet openings therein and therefrom; in the cover of a melting chamber arranged to rotate thereover and thus to carry around therewith the stirrers; in a bed vertically movable on a shaft, and provided with arc slots at each end, in which the stirrers are moved so as to give a double adjustment; in a bottom in which the metal is stirred, connected with the water in pan by intermediate heat-conducting bars; in a bar made in two or more pieces clamped together on shaft and journals of stirrer blocks; in a revolving cover, having a series of pendent fan blades; and in vibratory regulators applied to the stirrers. These features, taken together, form a very great improvement in puddling furnaces, not only rendering them capable of producing a better article of metal but in greater quantity.

Improved Iron Ore Separator.

Alexander Goodhart, Newville, Pa.—This invention consists in separating dirt from ore by drying them both together and then detaching the dirt by concussion. It also consists in a new mode of combining instrumentalities for drying the ore and dirt and for detaching the latter.

Improved Soldering Apparatus.

Wm. D. Brooks, Baltimore, Md.—This invention relates to means whereby the intense heat of the blow pipes is prevented from coming into close proximity with the can by an intermediate rotary soldering tool; also to peculiarities of construction in the soldering tool; also to a novel mode of constructing the bolt which couples together the sections that embrace the water, gas and air chambers; also to a novel mode of constructing a rotary tool intended to solder a cap to the body of a can without wasting the solder and smearing it on cap or head; and also to a method of constructing and putting together the gas and air chambers so that they can be readily separated in order to substitute larger or smaller burners.

Improved Fire Place.

Frederick Proudfoot, Toronto, Canada.—This invention consists chiefly of a fire place, which is provided with an open front and back and a single fuel or fire chamber to enable it to be inserted into partition walls of rooms for heating two adjacent compartments, and so arranged that it can be readily converted into a single or one front fire place. The invention further consists in the provision of a suspended fire or fuel basket located in the chamber of the fire place, and possessing a tubular shank which is adjustable on a stationary tubular post, said basket being also provided with counterbalance weights to cause the same to be elevated into the chimney when the fuel is removed. The invention also consists in the use or combination with such a fire place of a steam generating boiler or tank, and pipes to convey steam to the fire basket for aiding the combustion of the fuel, while the surplus steam is conveyed to the dome for radiation, and finally to the chimney.

Smoke and Gas Consuming Furnace and Steam Generator.

Oliver W. Ketchum, Toronto, Canada.—This invention consists of a steam boiler with a vertical air-tight cylinder situated in the boiler and containing the fuel, which cylinder is fired towards the bottom and is closed at the top with an air-tight door opening inwards. The invention also consists in providing the boiler on the inside with concave projections running through its length in both sides above the pipes referred to and above the water line, so that the ebullitions of water above said pipes and caused by escape of gas are thrown back into the middle of boiler. It also consists in providing the dome of boiler with concave pieces of iron resting one upon the other, constructed with spaces between each and between the sides of dome to act as additional deflectors.

Improved Twisting and Doubling Machine.

Albert H. Carroll, Baltimore, Md.—This invention relates to means by which the twister, flyer or spindle or twist plate of the twister and feed rolls of same twister or cord-making machine may be made to cease their operation automatically whenever a thread is broken or full number of ends ceases to be supplied to the rollers.

Improved Steam Engine Governor Valve.

Elijah Ware, Norfolk, Mass.—The invention consists in the improvement of governor valves. Openings are made in the sides of the valves, which allow the steam to enter the chambers in the shells. There may be four of these openings and chambers, so as to balance the valve when it is made of large diameter. An arm is attached to the valve stem and connected to the governor, by means of which the valve is partially revolved. The valve is made slightly tapering in the shell, so that any wear may be taken up readily and the valve made steam tight. The valve will work equally well in either direction, and the steam may enter and be discharged from either of the openings. Plug screws are provided, by the removal of either of which the position of the valve can be seen so that it can be varied or set by sight. A small hole is made (one or more) in the top of the valve to equalize the pressure.

Improved Mold for Forming Building Blocks.

Andrew Derrom, Paterson, N. J.—The invention consists in an improved construction of a concrete or brick mold. To form the blocks a mold or box, of the proper size and shape, is constructed, with the sides hinged together so as to allow the box to be thrown entirely open. When the box is in use, the sides are held in place by suitable fastenings. A false bottom is arranged by which to remove the block from the mold until it is hardened. After locking the sides of the box together, a layer of stone is placed in the box, and liquid cement is poured in until all the crevices between the stones are filled. Another layer of stone or brick is then inserted, more cement added and so on until the box is filled. The cement will set sufficiently in a few minutes to allow the box to be turned so as to bring the false bottom down, when the fastenings may be loosened and the sides turned down. The block may then be removed by means of and on the false bottom, and set away to dry, while the box is ready to be used again.

Improved Machinery for Spinning and Doubling.

Thomas Henry Rushton and Robert Tongue, Bolton, England.—The object of the first part of this invention is to simplify the gearing of band and self-acting mules for producing the after stretching and for giving motion to the front roller during the twisting at the head; also to render self acting mules suitable for spinning fine numbers. Secondly, in an improved arrangement of mechanism for locking edge fallers and for unlocking the long lever forming parts of a self acting mule.

Improvement in the Manufacture of Gas.

Frederick A. Sabbaton, Troy, N. Y.—This invention consists in the adaptation or application to a gas retort of a combined steam and air injector, whereby the tar from the hydraulic main or other gas depository is, in fine spray, forced under the retort and consumed. The injector is applied for the purpose of consuming the coal tar or other gas deposit produced in the manufacture of gas, thus saving a large amount of fuel used in heating the retort, and so arranged that the coal tar or other gas deposit from the hydraulic main or other place of deposit is carried direct to the injector, which is compactly arranged above the furnace door. By means of a current of steam, a spray of tar or other gas deposit, in combination with atmospheric air, is forced into the fire box or furnace, and there consumed.

Improved Stucco Cornice.

Andrew Derrom, Paterson, N. J.—The object of this invention is to facilitate the construction of cornices or other ornaments of plaster, cement, or other composition at places distant from those at which such ornamentation is to be finally and permanently applied. At present it is an item of considerable expense and some inconvenience to form ceiling and panel ornaments of plaster or similar substance, chiefly because the ornaments must be formed on the spot on which they are to remain, thus exposing the artisan to every inconvenience of angles, high ceiling, etc. The invention consists in constructing such ornaments on and around a frame work of wood or metal, so that by such frame work the brittle or fragile substance of the ornaments will be strengthened. Thus made, the ornaments, whatever their length or size, can be safely transported from place to place, and firmly attached by screws, pins, or other means to the walls or ceilings and each other.

Improved Door Check.

George E. Rittenhouse, Akron, O.—This invention is an improvement in the class of devices adapted to be applied to doors for holding them open at any desired angle; and it consists in a pivoted catch lever, a notched circular plate, and a rod, all arranged to adapt the lever to be locked in various positions, and thereby hold the rod engaged with the floor.

Value of Patents, AND HOW TO OBTAIN THEM. Practical Hints to Inventors.

PROBABLY no investment of a small sum of money brings a greater return than the expense incurred in obtaining a patent even when the invention is but a small one. Larger inventions are found to pay correspondingly well. The names of Blanchard, Morse, Bigelow, Colt, Ericsson, Howe, McCormick, Hce, and others, who have amassed immense fortunes from their inventions, are well known. And there are thousands of others who have realized large sums from their patents.

More than FIFTY THOUSAND inventors have availed themselves of the services of MUNN & Co. during the TWENTY-SIX years they have acted as solicitors and Publishers of the SCIENTIFIC AMERICAN. They stand at the head in this class of business; and their large corps of assistants, mostly selected from the ranks of the Patent Office: men capable of rendering the best service to the inventor, from the experience practically obtained while examiners in the Patent Office: enables MUNN & Co. to do everything appertaining to patents BETTER and CHEAPER than any other reliable agency.

HOW TO OBTAIN Patents. This is the closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had some experience in obtaining patents. His answer generally is as follows, and correct:

Construct a neat model, not over a foot in any dimension—smaller if possible—and send by express, prepaid, addressed to MUNN & Co., 37 Park Row, New York, together with a description of its operation and merits. On receipt thereof, they will examine the invention carefully, and advise you as to its patentability, free of charge. Or, if you have not time, or the means at hand, to construct a model, make as good a pen and ink sketch of the improvement as possible and send by mail. An answer as to the prospect of a patent will be received, usually, by return of mail. It is sometimes

best to have a search made at the Patent Office. Such a measure often saves the cost of an application for a patent.

Preliminary Examination.

In order to have such search, make out a written description of the invention, in your own words, and a pencil, or pen and ink, sketch. Send these, with the fee of \$5, by mail, addressed to MUNN & Co., 37 Park Row, and in due time you will receive an acknowledgment thereof, followed by a written report in regard to the patentability of your improvement. This special search is made with great care, among the models and patents at Washington, to ascertain whether the improvement presented is patentable.

Rejected Cases.

Rejected cases, or defective papers, remodeled for parties who have made applications for themselves, or through other agents. Terms moderate. Address MUNN & Co., stating particulars.

To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, 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.

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 is \$10. A pamphlet of advice regarding applications for patents and caveats is furnished gratis, on application by mail. Address MUNN & Co., 37 Park Row, New York.

Reissues.

A reissue is granted to the original patentee, his heirs, or the assignees of the entire interest, when, by reason of an insufficient or defective specification, the original patent is invalid, provided the error has arisen from inadvertence, accident, or mistake, without any fraudulent or deceptive intention.

A patentee may, at his option, have in his reissue a separate patent for each distinct part of the invention comprehended in his original application by paying the required fee in each case, and complying with the other requirements of the law, as in original applications. Address MUNN & Co., 37 Park Row, for full particulars.

Design Patents.

Foreign designers and manufacturers, who send goods to this country may secure patents here upon their new patterns, and thus prevent others from fabricating or selling the same goods in this market.

A patent for a design may be granted to any person, whether citizen or alien, for any new and original design for a manufacture, bust, statue, alto relievo, or bas relief; any new and original design for the printing of woolen, silk, cotton, or other fabrics; any new and original impression, ornament, pattern, print, or picture, to be printed, painted, cast, or otherwise placed on or worked into any article of manufacture.

Design patents are equally as important to citizens as to foreigners. For full particulars send for pamphlet to MUNN & Co., 37 Park Row, New York.

Foreign Patents.

The population of Great Britain is 31,000,000; of France, 37,000,000; Belgium, 5,000,000; Austria, 36,000,000; Prussia, 40,000,000; and Russia, 70,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. A large share of all the patents secured in foreign countries by Americans are obtained through our Agency. Address MUNN & Co., 37 Park Row, New York. Circulars with full information on foreign patents, furnished free.

Value of Extended Patents.

Did patentees realize the fact that their inventions are likely to be more productive of profit during the seven years of extension than the first full term for which their patents were granted, we think more would avail themselves of the extension privilege. Patents granted prior to 1861 may be extended for seven years, for the benefit of the inventor, or of his heirs in case of the decease of the former, by due application to the Patent Office, ninety days before the termination of the patent. The extended time inures to the benefit of the inventor, the assignees under the first term having no rights under the extension, except by special agreement. The Government fee for an extension is \$100, and it is necessary that good professional service be obtained to conduct the business before the Patent Office. Full information as to extensions may be had by addressing MUNN & Co., 37 Park Row.

Trademarks.

Any person or firm domiciled in the United States, or any firm or corporation residing in any foreign country where similar privileges are extended to citizens of the United States, may register their designs and obtain protection. This is very important to manufacturers in this country, and equally so to foreigners. For full particulars address MUNN & Co., 37 Park Row New York.

Canadian Patents.

On the first of September, 1872, the new patent law of Canada went into force, and patents are now granted to citizens of the United States on the same favorable terms as to citizens of the Dominion.

In order to apply for a patent in Canada, the applicant must furnish a model, specification and duplicate drawings, substantially the same as in applying for an American patent.

The patent may be taken out either for five years (government fee \$20) or for ten years (government fee \$40) or for fifteen years (government fee \$60). The five and ten year patents may be extended to the term of fifteen years. The formalities for extension are simple and not expensive.

American inventions, even if already patented in this country, can be patented in Canada provided the American patent is not more than one year old.

All persons who desire to take out patents in Canada are requested to communicate with MUNN & Co., 37 Park Row, N. Y., who will give prompt attention to the business and furnish full instruction.

Copies of Patents.

Persons desiring any patent issued from 1836 to November 26, 1867, can be supplied with official copies at a reasonable cost, the price depending upon the extent of drawings and length of specification.

Any patent issued since November 27, 1867, at which time the Patent Office commenced printing the drawings and specifications, may be had by remitting to this office \$1.

A copy of the claims of any patent issued since 1836 will be furnished for \$1.

When ordering copies, please to remit for the same as above, and state name of patentee, title of invention, and date of patent. Address MUNN & Co., Patent Solicitors, 37 Park Row, New York City.

MUNN & Co. will be happy to see inventors in person, at their office, or to advise them by letter. In all cases, they may expect an honest opinion. For such consultations, opinions and advice, no charge is made. Write plainly; do not use pencil, nor pale ink; be brief.

All business committed to our care, and all consultations, are kept secret and strictly confidential.

In all matters pertaining to patents, such as conducting interferences, procuring extensions, drawing assignments, examinations into the validity of patents, etc., special care and attention is given. For information, and for pamphlets of instruction and advice

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