

valve are not changes in the principle or in the manner of operation which would relieve their stop valve from condemnation as an infringement; they are a mere substitution of equivalents. For this reason it seems not improbable that the conclusion to which I am compelled is not because the actual invention of the complainants has not been infringed or copied by the defendant, but because the specification and claim upon which the patent is granted has so narrowed the ground upon which they stand that they fail to realize all the monopoly to which, in virtue of the actual invention, the patentee may have been entitled.

The bill of complaint must, therefore be dismissed with costs. J. Van Santvoord, for complainants. G. Gifford, for defendants.

THE NOVEMBER METEORS.—Between seven and eight hundred meteors were observed in the course of five hours, on the evening of November 27, at the Observatory of Vassar College, Poughkeepsie, N. Y.

Facts for the Ladies.—Mrs. Paschol, New Middleton, Tenn., has a Wheeler & Wilson Lock-Stitch Machine in use since 1853; it has run constantly without repairs; has 10 of the original 12 needles. Other kinds of machines wear out in a few years; she has never seen a Wheeler & Wilson worn out. In 1867, she earned \$317.75, besides doing the sewing for her family and six negro work hands and considerable for her neighbors. See the new Improvements and Woods' Lock-Stitch Ripper.

Business and Personal.

The Charge for Insertion under this head is One Dollar a Line. If the Notice exceed Four Lines, One Dollar and a Half per Line will be charged.

Ross Bro's Paint and Grain Mills, Williamsburgh, N. Y.

Wanted—Nail Keg Heading Turner. Manufacturers, send illustrated circulars and prices to William Brown, "Pioneer Steam Keg Works," St. Louis, Mo.

Male and Female Agents Wanted—100 per Cent. Profit. Address, with Stamp, for particulars, P. O. Drawer 217, Buffalo, N. Y.

For Steel and Iron Set Screws, send to Reynolds & Co. for Price List, New Haven, Ct.

For Sale, two Patents. Address H. S. Ball, Spartanburg, S.C.

Dobson's Patent Scroll Saws make 1100 strokes per minute. Satisfaction guaranteed. John B. Schenck's Sons, 118 Liberty St., N. Y.

Permanent Photograph Printing, just what is wanted by Manufacturers. Send for Circular and specimens to Amer. Photo Relief Printing Co., 1022 Arch St. Philadelphia, Pa. John Carbutt, Sup't.

Millstone Dressing Diamond Machine—Simple, effective, durable. For description of the above, see Scientific American, Nov. 27th, 1869. Also, Glazier's Diamonds. John Dickinson, 64 Nassau St., New York.

Agricultural Implements and Machines for Fall and Winter use. R. H. Allen & Co., 189 & 191 Water Street, New York.

Valuable Patent Right for Sale. The amusing Toy Attachment for Pianos, illustrated in SCIENTIFIC AMERICAN, October 28th, 1871. Address G. L. Wild & Bro., 420 11th St., Washington, D. C.

Boston Fire! Goodnow & Wightman, 23 Cornhill, were not burned out, and are ready to fill all orders for Tools and Materials. Catalogues were all burned, but will have more in about two weeks.

First Class Steam and Vacuum Gauges, Engine Registers, Davis' Recording Gauges. New York Steam Gauge Co., 46 Cortlandt St., N.Y.

Kahnweiler's Cotton Seed Huller, \$175. Is warranted perfect in its operation. Send stamp for circular to R. H. Allen & Co., New York, manufacturers and dealers in Agricultural Machinery of every kind.

Four Brick Machines, Combined with Steam Power (Winn' patent), makes 40 M. per day, for sale at a bargain. Address the manufacturers, John Cooper and Co., Mount Vernon, Ohio.

Absolutely the best protection against Fire—Babcock Extinguisher. F. W. Farwell, Secretary, 407 Broadway, New York.

Hydraulic Jacks and Presses—Second Hand Plug Tobacco Machinery. Address E. Lyon, 470 Grand St., New York.

Steam Boiler and Pipe Covering—Economy, Safety, and Durability. Saves from ten to twenty per cent. Chalmers Spence Company, foot East 9th Street, New York—1202 N. 2d Street, St. Louis.

Steel Castings "To Pattern," from ten pounds upward, can be forged and tempered. Address Collins & Co., No. 212 Water St., N. Y.

Heydrick's Traction Engine and Steam Plow, capable of ascending grades of 1 foot in 3 with perfect ease. The Patent Right for the Southern States for sale. Address W.H.H. Heydrick, Chestnut Hill, Phila.

The Berryman Steam Trap excels all others. The best is always the cheapest. Address I. B. Davis & Co., Hartford, Conn.

Peck's Patent Drop Press. Milo Peck & Co., New Haven, Ct.

Wanted—Copper, Brass, Tea Lead, and Turnings from all parts of the United States and Canada. Duplaine & Reeves, 760 South Broad Street, Philadelphia, Pa.

The Berryman Heater and Regulator for Steam Boilers—No one using Steam Boilers can afford to be without them. I. B. Davis & Co.

T. R. Bailey & Vail, Lockport, N. Y., Manf. Gauge Lathes.

For 2, 4, 6 & 8 H.P. Engines, address Twiss Bro., New Haven, Ct.

The Berryman Manuf. Co. make a specialty of the economy and safety in working Steam Boilers. I. B. Davis & Co., Hartford, Conn.

Williamson's Road Steamer and Steam Plow, with Rubber Tires. Address D. D. Williamson, 32 Broadway, N. Y., or Box 1809.

Belting as is Belting—Best Philadelphia Oak Tanned. C. W. Army, 301 and 303 Cherry Street, Philadelphia, Pa.

Boynton's Lightning Saws. The genuine \$500 challenge Will cut five times as fast as an ax. A six foot cross cut and buck saw, \$6. E. M. Boynton, 80 Beekman Street, New York, Sole Proprietor.

For Steam Fire Engines, address R. J. Gould, Newark, N. J.

Brown's Coal Yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable. W. D. Andrews & Bro. 414 Water st. N.Y.

For Solid Wrought-iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

All kinds of Presses and Dies. Bliss & Williams, successors to Mays & Bliss, 118 to 122 Plymouth St., Brooklyn. Send for Catalogue.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement, Andrew's Patent, inside page.

Presses, Dies & all can tools. Ferracute Mch. Wks, Bridgeton, N.J.

Gear Wheels for Models. Illustrated Price List free. Also

Materials of all kinds. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Machinists; Illustrated Catalogue of all kinds of small Tools and Materials sent free. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Gatling guns, that fire 400 shots per minute, with a range of over 1,000 yards, and which weigh only 125 pounds, are now being made at Colt's Armory, Hartford, Conn.

A New Machine for boring Pulleys, Gears, Spiders, etc. etc.

No limit to capacity. T. R. Bailey & Vail, Lockport, N. Y.

Winans' Boiler Powder, 11 Wall St., New York. Certain cure for Incrustations—17 years best in the market.

Notes & Queries

[We herewith present a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

1.—Is there any good fastening for rubber belts? All the iron fastenings that I have tried are only failures; and in common lacings, the oil used in dressing the leather spoils the belts.—J. E. S.

2.—Will some one inform me of a good and quick method of hardening hydraulic cement pipes, or concrete, which will not kill the natural petrifying process?—A. H. B.

3.—I have noticed that trees, struck by lightning, were never split if the bark was torn off, but have found them to subsequently split. Why are lightning rods twisted when struck? Why does lightning that coils round an object never do any damage?—J. C. S.

4.—Have there ever been scales constructed which will weigh correctly, pounds and ounces, at any temperature, through other means than the changeable weight at a fixed point, or the sliding weight and beam? If so, how are they constructed and what is the reason they are not in general use? Scales with springs seem to be unreliable; besides they answer the purpose only to a certain extent, as they do not weigh more than thirty or forty pounds.—A. B.

5.—H. A. S., of Hiogo, Japan, says:—I am an habitual smoker, and have often noticed, when enjoying a pipe or a cigar, that the smoke which tobacco produces changes its color during inhalation, that which escapes from the bowl of the pipe or end of cigar being of a bluer color than that which is puffed out of the mouth. I attribute this to the condensation of some one of the component parts of the smoke. I should be much obliged if some one would kindly inform me if I am correct, and if so, what is it that is condensed, and what condenses it?

6.—How can I get the hardest edge on a plate of cast iron or steel, or even wrought iron? What I want is a plate of strong metal, say half an inch thick, with one side say 1-16 deep, of the hardest metal to be got for an edge, to work in the ground or gravel, and still strong enough to stand some concussion. Will case hardening do? Can cast steel be case hardened to it? Also, can you tell me who is the original inventor of the vacuum steam pump?—H. B.



SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$1.50 a line, under the head of "Business and Personal." ALL references to back numbers must be by volume and page.

E. T. N., of Pa.—The mineral you send is iron pyrites—sulphur and iron.

B. J. K., of Ga., will find methods for curing his gun of its propensity to scatter fully described on pp. 42, 58, 74, 107 of our volume XXVI.

F. H. J. asks for practical directions for making bibulous paper for drying crystals, and for making salts of copper, cobalt, and silver. The paper can only be made in a paper mill, and common blotting paper will answer the purpose. The salts of metals can be purchased for very much less than they can be made. Consult any good chemistry for the processes.

C. Y. asks:—Will you please tell me through your paper what the difference is between a salinometer and a hydrometer? Answer: In principle, none. The salinometer is a glass tube graduated specially for salt water, to indicate different degrees of saltiness. A hydrometer is a similar instrument graded to indicate the specific gravity of any liquid in which it is placed.

J. A. S., of Ohio, says:—Will you please inform me how brass fittings obtain the beautiful finish for brass work usually seen on gas fixtures? I believe it is called dip lacquer finish. Please give the ingredients and proportion, and, if possible, the mixture of brass which produces the best results. Answer: The finish is obtained by dipping the article in nitric acid, a special quality called dipping acid being sold for the purpose. After dipping, the article is varnished. As to the metal, any brass foundry will give you that. It varies with the intended use of the casting. Fine yellow brass is composed of 66 parts of copper and 34 parts of zinc.

F. R. says:—Will you please tell me whether the diamonds used in the diamond drill are a manufactured article? A friend tells me they are so, but I think they are the true black diamond. Answer: The diamonds used in drills and stone saws are not manufactured. By no process at present known can the qualities of the diamond be imitated. The diamonds used in drills are known here as black diamonds, and have the appearance of close grained coal. This substance is termed by dealers carbonado, and appears to occupy a place between anthracite coal and the real diamond, having the hardness of the latter. The carbonado is found in Siberia and Brazil.

J. M. says:—I saw a reply to a correspondent concerning the old wheel question, and send this to say that, if you have no objection, after having expressed an unwillingness to admit discussion on that subject at this time, I will say to D. W. S., not only what I think, but exactly how it can be proved that, as per construction of the question, the wheel makes only one revolution; and this I will do with an article no longer than your reply to D. W. S., on page 330 in your last issue, with a few rings for a diagram. Please therefore to say to J. M. how you like my proposition. Should a discussion follow you are not required, you know, to take sides, if not so disposed. Answer: We should be very glad to re-open the wheel discussion if we were not fully satisfied that it could lead to no good result. The very same diagrams by which our correspondent thinks he can conclusively prove the one revolution, can be used by the two revolution people to establish the correctness of their ideas. In the course of the former discussion, we frequently received similar models and similar diagrams from opponents for the purpose of proving their views.

C. C., of Michigan, says:—I want to know if an air pump will take suction from the exhaust of a steam engine and force the steam into a rotary boiler for paper manufacture, creating a pressure of one hundred pounds to the square inch? Also, would such a pressure have the ordinary heat that one hundred pounds pressure has in an ordinary steam generator? Answer: An air pump would accomplish the object intended, but, to condense by compression to the extent indicated, would require it to be made very strong, would absorb very great power, and we should be inclined to expect it to prove an unprofitable experiment. Were the experiment made and the full pressure attained, the temperature of the steam would be the same as in the steam boiler at the same pressure, viz 337° Fahrenheit, with steam per gage at one hundred pounds per square inch. We should anticipate that it would be found far less expensive to take prime steam from the boiler at the desired pressure and temperature than to compress the exhaust steam as proposed.

In reply to H. E. C., query 2, page 345, I would say that faded writing can be restored by rubbing over with tincture of galls.—F. H. J., of N. Y.

To W. G. Blish, page 340.—A belt can be shifted with the loose pulley on the driving shaft if the driven shaft has a momentum that will keep it in motion until the belt is completely shifted, not otherwise. Also, crossed belts never run so well as straight ones. Better obtain more pulley surface by increasing the size of both pulleys, giving greater belt speed—a double gain. It is difficult to make a belt leave a tight for a loose pulley if the latter is much the smaller, but a slight difference is good practice.—J. E. S.

To B.S.P., query 3, page 345.—Make a solution of gutta percha in bisulphide of carbon, apply a coat or two around the leak in your gas bag; put also a coat or two on a thin piece of leather. Now warm the two coated surfaces, and at once press firmly together.—E. H. H., of Mass.

To H. E. C., query 2, page 345.—Faded ink can usually be restored. Try brushing over the writing a dilute solution of sulphuric acid to which a few drops of nitric acid have been added. When dry, brush over a dilute solution of prussiate of potash; the faded writing will exhibit a blue color, which will deepen on exposure. Or brush over the writing some solution of hydrosulphuret of ammonium, which by age and exposure has become yellow, and the writing will become black. Don't be astonished at the pleasant smell of this last plan.—E. H. H., of Mass.

To B. S., query 3, page 345.—Air slaked lime will not do for making lime cylinders. Take lumps of nice soft chalk, and cut out or turn your cylinders; place in a crucible together with some powdered chalk, submit to a bright red heat for an hour or two, and you will have nice lime as you can wish.—E. H. H., of Mass.

To I. W. C., query 4, page 345.—To a solution of nitrate of silver, add solution of cyanide of potassium until no further precipitate is formed; allow it to settle and pour off the clear liquor. Dissolve the sediment in enough solution of cyanide of potassium and form into a paste with prepared chalk. Rub some of this paste on your brass, or copper, or German silver, etc., and you will have a nice thin deposit of silver, of course not so thick or durable as if deposited by a battery. Be careful of the cyanide, as it is deadly poison, and do not let it get near a scratch.—E. H. H., of Mass.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

ROTARY STOOL.—George H. Spencer, Fitchburg, Mass.—This invention has for its object to improve the construction of rotary office stools, chairs, etc., and it consists in the cylindrical nut or spider made with radial arms, having longitudinal sockets formed in their outer ends, and in the legs or posts with their upper ends bent inward to enter the longitudinal sockets of the spider.

SLEEPING CAR.—William E. Gowdy, Waldron, N. Y.—This invention has for its object to improve the construction of sleeping cars in such a way that each berth may be closed as securely as a state room. When the panels are turned down upon the bottoms of the seats, and the cushions replaced upon said seats, the panels will be entirely out of the way. By this construction, also, all the parts that require to be detached and removed are certain partitions. This construction makes the berths or compartments of a sleeping car become as secure as a state room, and the occupant, when he has bolted the panels upon the inside, can sleep in safety.

DUMPING CAR.—John R. Dubois, Virginia City, Nevada.—This invention relates to improvements in the class of dumping cars in which the box is hinged and pivoted so as to be turned horizontally and also be tilted toward either side or end of the track; and it consists in the peculiar arrangement of locking devices for preventing the box from swinging around on the turn table at the same time that it is held from tilting.

FIREPROOF FLOOR AND CEILING.—George H. Johnson and Edwin R. Hall, Chicago, Ill.—The invention relates to a mode of forming a fireproof floor and ceiling by means of slabs and hollow tiles of burnt clay, plaster of Paris, or other incombustible material, applied to the upper and under side, respectively, of timber joists, the slab being of rectangular form and secured by the same devices as the floor boards which are laid thereon, and the tiles being of prismatic shape and provided with flanges to adapt them to cover and also be supported by strips attached to the sides of the joists.

CAR COUPLING.—Perry Brown, Louisville, Ky.—The invention is an improvement on that recently patented to same party. The link acts, as in that case, on a pivoted support for the coupling pin, so that the latter drops into its place as the cars come together. In this instance, the coupling pin is extended vertically to the top of the car, and is provided with a curved arm to act on a radial arm or projection of a similar extension of the shaft of the valve or said pivoted support, so that, the coupling pin being first raised, the support may be caused to move under it and thus place the coupling in readiness for automatic action without necessity for the operator to enter between the cars or descend from them for that purpose.

MEANS OF PROPULSION.—Seth R. Foster, St. John, Canada.—This invention relates to a new paddle attachment to steam engines for propelling vessels of various sizes, and consists in suspending the paddles directly from the ends of the walking beams of the propeller. The inventor proposes to impart the requisite vibratory motion to the beam by a jointed rod connection with a crank shaft, and to rotate the crank shaft by the pistons of two steam cylinders. The vibrations of the beam on its pivot serve to impart up and down motion to the dashes and paddles; but the horizontal sweep is imparted to the same by means of rods which connect them respectively with the cranks of the shaft. The invention can also be used for canal boats, in which case the propeller is placed on the bow or stern by a little alteration in its construction, namely, by having two walking beams instead of one, the sweeps attached to one end instead of both, and propelling machinery attached to the other end of each beam.

MILK COOLER.—Irving Wheeler, of Massena, N. Y.—This invention relates to an improved milk cooler by which a small quantity of water can be made to absorb nearly all the animal heat of the milk for the purpose of preparing it for market or for churning. The invention consists in the arrangement of a spiral water chamber beneath the milk pan for obtaining a large circulating channel, and, consequently, fully utilizing the heat absorbing qualities of the water.

INSOLE FOR BOOTS AND SHOES.—Garett H. Whitaker, Pittsfield, Mass., assignor to himself and Jacob Stewart, of same place.—This invention relates to a new insole for boots and shoes, with the object of keeping the feet warm by its use and of curing and preventing chilblains and other unpleasant and injurious diseases caused by cold feet. The invention consists in making the sole of three thicknesses of material, of which the lower is rubber cloth, the middle, palm leaf steeped in sulphur solution, and the upper, carpet.

SEED PLANTER.—John H. Dancy, of Dancyville, Tenn.—This invention relates to the class of seed planters in which the amount of seed required for a hill is elevated within the seed hopper and discharged through a hole in the upper part of the hopper into the drop tube.

SASH HOLDER.—William Wilson Amos, of Olathe, Kansas.—This invention has for its object to improve the construction of the sash holder and lock, for which letters patent No. 125,161 were issued April 2, 1872.

STEAM EXHAUST FOR LOCOMOTIVES.—Thomas Davies, of Cleveland, Ohio.—This invention relates to an improvement in the means for supporting the ring jet pipes through which the steam is exhausted in certain marine boilers.

SAWING MACHINE.—William C. Daniel, of Point Pleasant, Mo.—This invention relates to a new reciprocating buck saw, in which the saw frame and carriage are vertically adjustable and suspended from a windlass which unwinds automatically by means of an escapement attachment.

FORM FOR LAYING BRICK PAVEMENTS.—Samuel C. Brewer, of Water Valley, Miss.—This invention is embodied in a device for gaging the bricks for laying "herring-bone" pavement, calculated to insure regularity in the work.

ELEVATED WIRE WAY.—George Killam, of Fort Dodge, Iowa.—This invention has for its object to furnish an improved construction for elevated railroads. The track is supported by two rows of posts, at a distance apart equal to the width of the track.

ORE CLEANER AND SEPARATOR.—John H. Hillman, of Trigg Furnace, Ky.—This invention has for its object to furnish an improved machine for separating or cleaning ore by a current or blast of air.

ADJUSTABLE SCAFFOLD.—William A. Jester, of Holliiday's Cove, W. Va.—The object of this invention is to furnish a safe and convenient means for supporting house builders and painters with their materials and implements by the sides of buildings.

LAST.—Joseph Anzer, of Ashtabula, Ohio.—The invention consists in providing means for locking the two parts of a last against lateral as well as vertical displacement.

PACKING BOARD FOR PENCILS.—Orestes Cleveland, of Jersey City, N. J.—This invention has for its object to produce a compact and symmetrical package of lead pencils, pen holders, crayons, or similar articles.

MACHINE FOR TURNING LOGS IN SAW MILLS.—George W. Baker, Elizabeth City, N. C.—This invention consists in the provision of a sliding carriage moving horizontally in ways or guides beneath the log deck and carrying a vertically reciprocating toothed turning bar.

MANUFACTURE OF SALT.—John McGrew, Ravenswood, W. Va.—The invention consists in providing the inside of a furnace with an air jacket and discharging the heated air into the bottom of a vessel of brine or salt water.

MEDICAL COMPOUND FOR THE CURE OF DIARRHŒA.—Mrs. A. B. Dorman, Cape Girardeau, Mo.—The invention consists in red oak bark, cinnamon, cloves, dandelion root, and brandy mixed in certain proportions with boiling water.

CAR COUPLING.—Darius Sutherland, Milo, Ill.—The invention relates to that special class of car couplings which are made to couple the cars automatically or by impact, and it consists in attaching the pin to a lever and weighted lift bar, arranged outside of the draw head and above the platform of car.

WHIFFLETREE FOR DETACHING HORSES FROM VEHICLES.—Albert H. McAlister, Cotton Plant, Miss.—This invention has for its object to furnish an improved whiffletree, which shall be so constructed that should the horse or horses become frightened or otherwise unmanageable, or should other cause or causes render it advisable, they may be readily detached from the carriage and allowed to go free.

TUBING TONGS.—George A. Holden, Ruggville, Pa., assignor to himself and J. R. Holden, of same place.—This invention has for its object to furnish an improved tubing tongs or pipe wrench, designed especially for taking tubing out of and putting it into wells, and which shall be so constructed as to take a prompt and firm hold upon the pipe.

ADDRESS PLATE FOR TRUNKS.—James E. Kirk, Marlborough, Mass.—This invention relates to a new construction of address plates for trunks, boxes, etc., in which the paper, slate, or other substance upon which the address is written is held beneath a small pane of glass by a hinged frame.

CHECK PUNCH.—José R. Mesa, Brooklyn, N. Y.—This invention has for its object to produce an instrument for punching the number or amount to which checks or similar documents of value are drawn through the same and feeding the same forward to obtain the necessary spaces between the figures punched.

BOTTLE RINSE.—James Roue, St. John, Canada.—The object of this invention is to provide convenient and efficient means for rinsing soda water and other bottles, tumblers, and similar vessels. It consists in the valve chamber or shell, consisting of a vertical tube with one or more branches, for attaching a supply pipe from the water fountain.

TOOL REST FOR LATHES.—Charles F. Hadley, Chicopee, Mass.—The invention consists in the combination of a horizontal screw and nut with an inclined lever, which supports the tool rest, and which determines the height of the same by its greater or less inclination.

TONGUEING AND GROOVING KNIFE.—William B. McClain, Sandusky, Ohio.—This invention has for its object to make tongueing and grooving knives adjustable, so as to enable their use for larger or smaller tongues, deeper or shallower grooves, without requiring their removal from the cutter head.

[OFFICIAL.]

Index of Inventions

For which Letters Patent of the United States were granted.

FOR THE WEEK ENDING NOVEMBER 12, 1872, AND EACH BEARING THAT DATE.

SCHEDULE OF PATENT FEES:

Table with 2 columns: Description of fee type and Amount. Includes: On each Caveat (\$10), On each Trade-Mark (\$25), On filing each application for a Patent (seventeen years) (\$15), On issuing each original Patent (\$20), On appeal to Examiners-in-Chief (\$10), On appeal to Commissioner of Patents (\$20), On application for Reissue (\$30), On application for Extension of Patent (\$50), On granting the Extension (\$50), On filing a Disclaimer (\$10), On an application for Design (three and a half years) (\$10), On an application for Design (seven years) (\$15), On an application for Design (fourteen years) (\$30).

Table listing inventions and their patent numbers. Includes: Air compressing apparatus, B. T. Babbitt (133,004); Air navigating apparatus, C. McDermott (133,046); Amalgamating gold and silver, apparatus for, J. Oliver (133,019); Animal deposits in streets, apparatus for preventing, E. Berlinger (133,007); Auger, earth, I. N. Pyle (132,980); Baby jumper, S. G. Bigelow (133,008); Bed bottom, spring, J. Ralston (132,982); Belt clasp, J. T. Senn (133,061); Boiler, wash, G. M. Prime (132,979); Boiler attachment, wash, G. H. Waldo (132,940); Boiler, steam wash, J. C. Nobles (132,918); Boiler feeder, automatic, J. N. Poage (133,052); Blowing apparatus, J. M. Bailey (132,991); Boot and shoe, India rubber, L. Elliott, Jr. (133,020); Boots and shoes, thread for sewing soles to, G. V. Sheffield (132,926); Bottling apparatus, A. S. Taylor (133,068); Bottling machine, Armstrong and Marks (133,008); Bridge, hose, I. P. Maxwell (133,045); Bridges, girder and chord for iron, Mills and Smith (132,975); Bronzing compound, A. Towne (132,998); Broom straw, coloring and toughening, S. Greger (132,961); Bullets, machine for making, G. R. Stetson (133,066); Bungs, machine for making, C. Abel (132,943); Burner, vapor, O. N. Perkins (133,051); Bustle, D. Smith (133,052); Butter carrier, B. Yaw (132,998); Butter printer, B. Yaw (132,999); Car coupling, E. T. Barlow (133,001); Car spring, A. Bridges (133,010); Car and truck, railroad, W. Youmans (133,001); Car axle box, street, A. Wight (133,073); Carpet cleaning machine, Smith and Story (132,927); Carriage wheels, hub for, J. Ridge (132,924); Cartridge box, P. S. and F. M. Thomson (132,992); Carving, polishing, etc., machine for, R. T. Smith (132,923); Cement, W. McKay (132,978); Chains, machine for making ornamental, Bancroft and Wood (132,947); Chair seat and back, A. B. Clark (132,951); Chess and checkerboard, S. L. Fleishman (132,905);

Table listing inventions and their patent numbers. Includes: Closet, earth, G. H. Vroom (133,071); Clothes dryer, G. W. Paige (132,92); Clothes rack, H. W. Ross (133,058); Combination tool, D. Heaton (132,908); Corn sheller, hand, J. O. Frazier (132,958); Cornice for drapery, H. R. Watson (132,941); Cracker machine, W. Cairns (133,014); Cream strainer, H. Blake (133,009); Cultivator, J. G. Stowe (133,067); Dental engine, J. B. Morrison (reissue) (5,143); Ditching machine, A. Spencer (132,929); Ditching machine, S. E. Todd (133,069); Door securer, G. B. Pharo (132,922); Drawer support, J. Baggs (133,005); Dryer, fruit, B. L. Ryder (133,060); Drill holes, device for charging, F. X. Lavalle (133,040); Dredging machine, pneumatic, Faber du Faur and Campbell (133,022); Drugs, adjustable damper for heating, A. J. Lovejoy (132,913); Egg carrier, W. D. Taber (132,937); Fence, portable, J. J. McMaken (132,916); Fire arm, breech loading, W. S. Smoot (133,063); Flour bolt, J. W. Johnson (132,965); Fly catcher, C. E. Penny (132,977); Fly catcher, W. H. Rice (133,056); Fruit box, C. W. Weston (132,942); Fruit knife gage, C. R. Howe (133,081); Furnace for roasting ore, M. P. Ross (132,992); Furnace, apparatus for charging blast, W. A. Miles (132,974); Furrow staff, G. H. Comer (132,952); Galvanic battery, W. J. Wilder (133,007); Gas fittings, machine for tapping, R. T. Crane (133,016); Gas pipes, drip or water tap for, J. H. Vansteenberg (132,989); Gate, flexible, J. M. Richardson (132,067); Glass bottle mold, J. J. Christie (132,997); Grain thrasher, F. Leadbeter (132,969); Grain cleaner, J. P. Leonard (133,041); Grain separator, E. R. J. Ueberroth (133,070); Harness, rosette for, F. F. Reynolds (132,983); Harness, hold back for, J. C. Covert, (reissue) (5,141); Harrow, T. C. Hooker (132,964); Harvester, hemp, O. Farra, (reissue) (5,142); Harvester, W. R. Low (132,970); Harvester dropper, A. Goodyear (133,025); Hatchet, D. E. Weaver (132,996); Hay loader, A. Garver (132,960); Heel trimming machine, C. J. Addy (132,944); Heeltrimming or burnishing machine, holding device for, J. R. Folsom (132,957); Hides, mode of tanning, J. R. Enos (133,021); Horse hay rake, J. Heidy (133,028); Hose, A. S. Libby (133,044); Insect destroyer, J. G. G. Garrett (133,023); Iron wedge, A. L. McIntyre (132,915); Iron and steel, welding, J. M. Cooper (132,900); Iron and steel, apparatus for casting ingots of, A. L. Holley (133,080); Jib stays, backer for, T. Lynch (132,971); Kaleidoscope, telescopic, J. Pool (132,978); Ladder, construction of step, C. G. Udell (132,938); Lamp, A. J. Martin (132,972); Lantern, G. Wallingford (132,995); Lantern, A. French (132,906); Leather, machine for softening, H. Cunningham (132,902); Leather, stoning, glassing and pebbling, H. Cunningham (132,901); Letter box, L. De Mets (132,954); Lock, permutation, T. J. Sullivan (132,936); Lock, seal, Brooks and Whitney (133,011); Lock, till, C. B. and W. H. Jackson (133,683); Mowing machine, Burdick and Le Roy (133,013); Oil cake trimmer, W. Hawes (132,962); Oil cans, stopper for, E. C. Godwin (133,024); Oils and paints, box and can for, Everest and Ross (132,955); Ornaments, method of producing metal, W. Henigst (133,029); Paper feeding device, A. A. Dunk (132,904); Paper bags, machine for making, C. F. Annan (132,890); Paraffin, treatment and purification of, Letchford and Nation (133,042); Pavement, wood, H. G. McGonegal (133,047); Photograph mount, A. C. Partridge, (reissue) (5,144); Pinion, reversible watch, N. Staffin (133,064); Piston packing, G. W. Relsinger (133,054); Planter, corn, H. A. Ridley (132,984); Planter, corn, J. Rice (133,055); Plow, gang, C. Kewin (132,910); Potato digger, J. P. Radley (132,923); Preserving and packing box, B. Yaw (133,000); Printing machine, electrical, T. A. Edison (133,019); Printing presses, feed board for, E. Allen (133,002); Projectile, sub-caliber, E. A. Dana (132,903); Pump, oscillating, W. Painter (133,048); Quartz mills, tappet for, B. McCauley (132,914); Railroad rail joint, T. Slaughter (132,988); Railroad rail joint, J. McL. Staughton (132,990); Railway cross tie, D. C. Kellam (132,966); Rake, horse hay, J. H. Bullard (133,012); Rudder, R. H. Thomas (132,991); Sall, reefing, West and Smith (133,072); Sash fastener, C. C. Algeo (132,945); Sash fastener, window, C. Partello (133,050); Saw, N. Johnson (133,036); Saw frame, W. Hankin, Sr. (133,027); Saw mill, D. Cilley (133,015); Saw blades, machine for grinding, C. H. Colby (132,898); Screw, wood, J. S. Armstrong (132,946); Screw cutting machine, J. J. Grant (133,026); Sewing machine, C. E. Langmaid (132,968); Sewing machines, driving mechanism for, I. P. Fishburn (132,956); Sheet metal ware, bottoming, W. C. Bruson (132,895); Sifter or pulverizer, W. C. Bruson (132,896); Spinning machine, M. Stell (133,065); Spinning machines, spindle and bobbin for, J. Roper (132,966); Spike, H. Stibbs (132,984); Spirits, etc., apparatus for rectifying and distilling, E. F. Prentiss (133,053); Stave equalizer, E. P. Spaulding (132,989); Steam boiler alarm, J. H. and W. J. Killey (132,967); Steam boiler covering, J. D. Jones (133,037); Stereoscope, A. Quirolo (132,981); Stone, machine for quarrying, E. Norton (132,976); Stove, fire place heating, H. R. Robbins, (reissue) (5,145); Strainer and funnel combined, C. W. and L. H. Heermance (132,963); Sugar in blocks or cubes, manufacture of, A. F. W. Partz (132,921); Sugar in cubes, apparatus for cutting disks of, J. King (132,911); Table, rotating reading, T. Cartwright (132,950); Telegraph instrument, J. B. Stearns (132,980); Telegraph instrument, etc., J. B. Stearns (132,982); Telegraph instrument, duplex, J. B. Stearns (132,983); Telegraph instrument, printing, E. Gray (132,907); Thrashing machines, dust conveyor for, J. and P. W. Brownback (132,894); Tobacco dressing machine, H. Suggett (132,985); Tower, elevating, J. W. Davis (133,017); Trap, animal, G. Barr (132,918); Uterine support, G. Dirksen (133,018); Valve, balanced slide, H. Kessler (133,088); Valve for gas works, shut off, P. Munzinger (132,917); Vault light, T. Hyatt (133,082); Vehicle spring, C. W. Salade (132,925); Vehicle wheel, W. A. Lewis (133,043); Wagon, C. Jarnagin (133,084);