

patented by others, and finally introduced in 1867, a year before Cochran filed his second application. Held; that while the new petition did not of itself sever the second application from the first, his acts and conduct show that the proceeding had been abandoned, and there was no continuity in the two applications.

The case distinguished from *Smith vs. Dental Vulcanite Company*, where the first application had never been withdrawn, and the inventor was unremitting in his endeavors to obtain a patent.

Forfeiture or abandonment may be inferred from the acts of an inventor who, without substantial reason or excuse, neglects the use of his invention and sleeps upon his rights for a number of years, while others in the meantime produce the same thing and give the public the benefit thereof; and the same is true whether the device be patented or had gone into use, without a patent.

A use for the mere purpose of competitive examination, experiment, and test, is not a public use.

Bill dismissed.

Frederick H. Betts and George Wigford, for plaintiffs.
Benjamin F. Thurston and John S. Beach, for defendants.

Inventions Patented in England by Americans.

From March 31 to April 9, 1877, inclusive.

BOOT MAKING MACHINERY.—S. Henshall, Philadelphia, Pa.
CONTROLLING CRANES, ETC.—T. A. Weston, Stamford, Conn.
EXERCISING APPARATUS.—G. W. Wood, New York city.
EXHAUST NOZZLE.—T. Shaw, Philadelphia, Pa.
FLANGE MACHINE.—C. Miller et al., Pittsburgh, Pa.
LAMP GLOBE, ETC.—Meriden Glass Company, Meriden, Conn.
MOWER.—J. R. Parsons, Hoosick Falls, N. Y.
RECOVERING TIN FROM SCRAP.—N. S. Keith, Brooklyn, N. Y.
REFINING SUGAR.—F. O. Matthiessen, Irvington, N. Y.
ROVING TWISTER.—J. S. Kirks, Chester, Pa.
SCRAP BOOK, ETC.—B. J. Beck, Brooklyn, N. Y.
SHUTTLE.—D. H. Chamberlain, Boston, Mass.
STENCH TRAP.—J. H. Mackie, Oakland, Cal.
TIME GLOBE.—L. P. Jewet, Glen's Falls, N. Y.
TRIMMING BOOT HEELS.—J. H. Busell, Boston, Mass.
TRUNK, ETC.—W. S. Soule et al., Mass.

Recent American and Foreign Patents.

NEW HOUSEHOLD INVENTIONS.

IMPROVED COFFEE POT.

Richard L. Nelson, Orange Court House, Va.—This invention is an improvement upon that for which letters patent have been lately granted to same party. The objects aimed at in the present improvement are to render the former "drip attachment" more compact, to lessen the number of parts composing it, to reduce the cost of the same, and to lessen the time required for making coffee.

IMPROVED SCRUBBING MACHINE.

Peter Byrne, Jr., Norwalk, Wis.—This machine consists of a wheeled frame, carrying a reciprocating scrubber and mechanism for operating it; also a water holder, which is connected with the scrubber by a flexible tube, and a mop and pan, for taking up the water that has been used in the scrubbing operation. The machine is pushed about on its wheels, so that the floor is both scrubbed and mopped as the machine advances.

IMPROVED MOSQUITO NET FRAME.

Johann F. Volle, Houston, Tex.—This invention consists mainly in vertical posts or rods, swiveled to the head of a bedstead, and having horizontal arms to which the net is attached by means of sliding rings. The invention further consists in connecting the said arms by a crossbar or rod which is adapted to slide thereon, and to which the net is likewise attached in the same manner as to the swinging arms. The invention further relates to the peculiar arrangement of cords for adjusting or operating the swiveled posts and extending or retracting the net.

IMPROVED SPRING BED BOTTOM.

William M. Edmans, Troy, N. Y.—This invention consists in wire springs, bent into forked or branched form, having their ends turned upward, to enter the lower side of the end rails of the bed bottom. The upper outer corners of the end rails are rounded off, and the springs are curved inward above them. The ends of the springs are bent upward at right angles, to enter holes in the spring slats.

IMPROVED LAMP SHADE HOLDER.

Hiram L. Ives, Troy, N. Y., assignor to himself and T. Henry Dutcher, of same place.—This is an improved illuminating shade holder for lamps, by which different sized shades may be used, and a more perfect combustion and brighter light without the use of a chimney produced. The holder is made of inverted conical shape and of transparent glass, the angle of the sides being so arranged that the rays of light are reflected from the shade at the opposite side of the holder. The upper circumference of the shade holder is provided with two flanges, of which the inner flange is supported on an inclined collar, and slightly below the level of the outer flange, so that a shade seated on the inner flange will almost touch the outer flange and form a neater finish therewith.

IMPROVED KNIFE-SCOURING PAN.

David H. Cassel and George W. Zint, Crestline, O.—This is an improved pan for the convenient scouring of knives and forks; and it consists of a sheet metal dish or pan with inclined center plane or rest piece for the knives and forks, and a front partition, providing a receptacle for the scouring powder. The scouring powder is taken up and applied directly to the knife or fork, bringing always a fresh quantity in contact with the same as the spent powder is dropped from the rest piece into the spaces at both sides of the same. The inventor claims that the scouring of knives and forks is by this pan accomplished in a neater and more convenient manner, the pan forming a clean and readily available device for that purpose.

IMPROVED BUTTER DISH.

William H. Fitch, Brooklyn, N. Y.—This butter dish or plate is stamped up of a sheet-metal blank in the customary manner. The sides of the dish are made straight with outward inclination, and connected at the corners by outwardly projecting mouldings, which are thrown beyond the outside edge of the dish by narrow tapering sections, that extend at right angles, or nearly so, from the sides. This outwardly projecting section serves not only to stiffen the sides, but mainly for the purpose of providing for the surplus stock at the corners, and avoiding the creasing or wrinkling of the sides by the too large quantity of stock at the rounded off corners. The throwing or bulging out of the corners has the additional advantage of requiring less power in stamping the dishes, so that two or more may be stamped up by the same blow, and of producing a smooth, stiff, and durable dish of uniform appearance, and without the objectionable folds or creases that are generally found in sheet-metal dishes of this kind.

IMPROVED PROVISION SAFE.

Ezra Webb, Brooklyn, N. Y., assignor to Mrs. S. E. Shutter, New York city.—This invention is intended to be placed in a window when there may be a scarcity of closet-room, to receive cooked and uncooked provisions, and to be so constructed that it may serve also as a refrigerator. A safe has wire cloth in its front and back, so that the air may pass through it freely. The top of the safe is made inclined, so that the rain may run off it freely. The front of the safe may be provided with a single door or with double doors, as may be desired. In the bottom is placed a pan in which may be placed a rack to receive ice, shelves being placed in the upper part of the said compartment. The drip water from the ice chamber may be received in a pan or other receptacle, or may be conducted away by a pipe.

IMPROVED WASHBOARD.

William Serviss, Sidney, O., assignor to W. M. Serviss & Co., of same place.—This invention consists in making a washboard entirely of metal, the object being to provide a washboard that will not warp when subjected

to the action of hot water and soap, and that is light, durable, and easily repaired.

NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.

IMPROVED FELLY.

William A. Wharton, Belle Centre, O., assignor to himself and H. E. Lambert, of same place.—In this invention, a section of felly, is made from malleable iron, or any other suitable metal, so as to present the same exterior form and appearance as the ordinary wooden felly; but from its peripheral or tire side it is chambered out to lighten and cheapen it. Holes are made in it to receive the spokes, and from one of its ends a dowel projects, and in the opposite end a hole is made to receive the dowel of the adjoining felly section. These holes may be provided in both ends of the felly section, and a pin or bolt used to connect the adjoining ends of the felly, if desired. A block, having the same form as the transverse section of the felly, provided with a central opening for receiving the dowel, is placed between the ends of the felly sections when the wheel is made; and when the spokes become worn, so that when it becomes necessary to contract the rim of the wheel, one or more of the said blocks may be removed and the rim contracted, so as to force the spokes farther into the hub when the tire is struck on.

IMPROVED FASTENER FOR MEETING-RAILS OF SASHES.

William T. Doremus, New York city.—This is an improved window sash stop, so constructed as to operate automatically to fasten the sashes when they are closed, so that it is impossible to close the window and leave the sashes unfastened, and which may be also used to lock the sashes, so that they will not shake and rattle with the wind. The invention consists in combining with a stoppivoted plate, and having a toe, a pivoted lock plate having upwardly projecting inclined flanges and shoulders upon its sides. The stop is so formed that, when left free, its weight will cause its lower forward corner to project, so that when the upper sash is raised into place, or the lower sash is lowered into place in closing the window, the corner of the stop will be over the top rail of the said lower sash, and the window will be securely fastened.

NEW MISCELLANEOUS INVENTIONS.

IMPROVED COIN TRAY.

Albert A. Hyde, Wichita, Kan.—This is an improved tray for the use of bankers and others using large quantities of coin, to enable them to have the coin in a convenient shape, and to facilitate the removal of the coin from the tray when desired. The sides of the tray are attached to the side edges of the bottom, the lower parts of which project below said bottom to serve as feet, and are so formed as to give the bottom a slight forward inclination, to prevent the coin from falling out at the open rear side. The interior of the tray is divided into compartments by vertical partitions, which are attached to the bottom and the front. The partitions are so arranged that the compartments may correspond in width with the diameter of the coins to be placed in them. The bottom of the tray is graduated or made of different thicknesses, so that each pile of coin, when made level with the top of the tray, may contain even dollars, and may thus prove the count or render the counting of the full piles unnecessary. A handle is formed upon or attached to the rear edge of the bottom for convenience in handling the tray. A lifter is used for removing the piles of coin from the compartments of the tray. The forward end of the lifter is concaved to rest against the side of a pile of coin, and to the lower edge of the forward end of said coin-lifter is attached a thin metal plate, to be slipped beneath a pile of coin, so that the whole pile of coin may be removed at once when desired.

IMPROVED STATION INDICATOR.

John Peter Schmitz, San Francisco, Cal.—This apparatus is simple in construction, and operated by the driver of the street car, or brakeman of the steam car, on which it is placed. It indicates the streets or stations passed on the route by the names thereof appearing through a slot in the side of the case containing the endless traveling apron on which the names are printed. The apron passes around suitable rollers.

IMPROVED WATER ELEVATOR.

Abraham Vantrump, West Elkton, O.—The buckets on an endless chain empty into a trough above the platform, with exit-spout to keep up a steady stream. By reversing the motion of the elevator, the buckets are emptied, which is of advantage in summer, as there is no water wasted, and the same is always obtained fresh and cool, while it prevents in the winter season the freezing of the contents of the buckets.

IMPROVED COTTON CHOPPER.

John P. Harrison, Aberdeen, Miss.—This cotton chopper is so constructed as to chop the crop to a stand by being drawn across the field. The hoes may be adjusted wider apart or closer together, according to the number of stalks desired to be left.

IMPROVED LEVEL.

Thomas H. Burk, New York city.—This invention admits of convenient observation from top and side during use; and it consists of a level and plumb having indicators, which are operated by a weight hung to the center shaft of the side indicators, and working at the same time a top indicator by bevel gear connection. A vertically supported shaft, that passes through the top dial, carries an index hand at the upper end, which hand is in line with the side indicators when they are in vertical position, but follows the motions of the side hands in exact manner, so as to instantly indicate whether the rule is in level or plumb position or not. The joint working of the index hands facilitates the use of the implement, as the positions of the hands may be seen at a glance from the side or top without necessitating stooping down to observe the side indicators.

IMPROVED HORSE COLLAR.

Hezekiah W. Whitney and Charles F. Whitney, Oswego, N. Y.—This horse collar is from parts of peculiar form, secured together by means of rivets and stitching, so as to form a durable and comfortable collar. The face of the pad, or part of the collar that comes into contact with the horse's breast, is cut with a convex outer edge and a curved inner edge. The ends of the face part are cut diagonally to fit the other portions of the collar to which it is attached. The threads of the stitching draw the inner and outer surfaces of the collar together, forming one crease for receiving the hames, and another for relieving the pressure on the breast of the horse and preventing galling. A flat surface is formed for relieving the horse's breast from pressure. This surface is quilted to prevent it from becoming convex.

NEW MECHANICAL AND ENGINEERING INVENTIONS.

IMPROVED WINDMILL.

Daniel Nysewander, Springfield, O.—This invention consists in the combination of two segmental gear wheels, two regulating vanes, and an adjustable weight with the turn-table and the main vane; in the combination of the flaring flanges with the edges of the wings of the wind wheel; in the combination of brace bars with the flanges and the wings of the wind wheel; and in the combination of upright bar, cross bar, hinge bar, and the vane. It is too elaborate an invention to be adequately described without engravings.

IMPROVED COTTON PRESS.

James Templeton, Florence, Ga.—The object of this invention is to furnish a hand power cotton press of cheap, simple, and effective construction,

by which the packing and baling of cotton or other material are facilitated and accomplished with less danger from the fulcrum lever. The invention consists of a lint box, filled from the top, and is operated by an upwardly moving follower and sliding top panel. The base frame of the cotton press is supported on cross sills, and provided with uprights that are braced in suitable manner to the base sills, and strengthened by lateral pieces, so as to form a strong and rigid support for the lint box. The lint box extends either through the floor of the building from the lint room down to the ground, or the same is provided, when the press is put up outside of the shed or building, with a platform around the lint box, at suitable height above the base frame or sill.

IMPROVED MACHINE FOR WINDING HAY INTO ROLLS FOR FUEL.

Ebenezer Harding, Delavan, Minn.—This machine winds hay or straw into rolls or twists for the purpose of using the same in a compact and convenient form for fuel; and the invention consists of a flat revolving spindle, in combination with a sliding and lever-actuated pressure roller, the hay being wound upon the spindle, which is withdrawn when the roll is finished. After the hay is attached to the spindle by being wound once or twice around the same, the spindle is revolved by one hand, and the roller pressed at the same time tightly, by the lever, with the other hand, against the hay, so as to form a closely wound roll of hay or straw, of any desired size, around the spindle. When the hay has the required size, the spindle is withdrawn, by pulling the crank sideways, and the roll removed. The next roll is then formed in the same manner, and thus any quantity of the surplus hay or straw is worked up quickly into rolls of compact shape, which may be used in convenient manner as fuel, in place of wood, and burned in any stove.

NEW AGRICULTURAL INVENTIONS.

IMPROVED CORN PLANTER.

Harrison Wagoner, Coshocton, O.—This planter is so constructed as to open a channel to receive the seed, drop the seed at uniform distances apart, cover the seed, and mark the rows, so that the planting may be done in accurate check row. By this construction the dropping slides are drawn back to drop the seed with a slow movement, and are pushed forward to again receive seed with a quick movement, so as to jar the seed and insure the filling of their dropping holes.

IMPROVED PLOW.

Robert B. Thomson, Dansville, Mich.—This plow consists of a combination of a mould-board, point, landside, forward standard, rear standard, and beam. The standards are made with bends or offsets near their upper ends, to bring the beam directly over the line of resistance. The upper end of the forward standard has a forward projection or arm formed upon it, through which passes the bolt that secures and pivots the beam to the said standard. Upon the upper end of the rear standard is formed a projection or plate, which is made in the form of a section of a circle. The forward edge of the plate is concaved, and has a flange formed upon its lower side to receive the hook of the hook bolt, which passes up through the rear end of the beam, so that by loosening the nut of the bolt the rear end of the plow beam may be moved from or toward the unplowed land, to adjust the plow to take or leave land, as may be desired. The colter is entirely independent of the beam, and may be adjusted up or down and toward or from the land, as may be desired. The handles are connected by rounds, the lower ends of which are secured to the landside and mouldboard by bolts, the upper bolts passing through slots, so that the rear ends of the handles may be raised and lowered to correspond with the height of the plowman.

IMPROVED CORN PLANTER.

Charles L. Goethals, Los Angeles, Cal.—This machine is so constructed as to open a furrow to receive the seed, drop the seed, and cover it. The new feature consists in the lever which works the dropping slide.

IMPROVED DITCHING MACHINE.

Thomas N. Turner and Sanford Turner, Rushville, Ind.—The sides of the ditch are cut by colters, the lower ends of which are attached to the forward corners of the share. The cutting edge of the share is made V-shaped, and its rear part is inclined upward, so as to deposit the dirt upon the endless belt of the elevator. With this machine a slice about six inches deep may be taken from the bottom of the ditch at each passage, and by passing back and forth a sufficient number of times the ditch may be sunk to any desired depth.

IMPROVED CORN SHELLER.

Herman Neubert, Ironton, O.—The forward part of the shaft is divided into four branches, to the outer ends of which is attached a ring plate. Upon the inner edge of the ring plate are formed four knives, the edges of which are inclined, and which are bent into such a shape that their said edges may rest upon the ear diagonally. To the branches of the shaft, at a little distance from their ends, is attached a ring plate, upon the inner edge of which are formed lugs which are bent forward at right angles to extend along the ear longitudinally. A tube keeps the kernels from scattering as they are removed from the cob by the knives and lugs.

IMPROVED HAND CORN PLANTER.

William E. Seelye, Anoka, Minn.—The lower part of the front of the seed chamber is formed of a spring plate, which will spring inward to close the chamber when a plunger is raised, and is pushed outward to allow the seed to drop into the ground when the said plunger is pushed down. The plunger is attached to the lower end of a bar, that slides up and down upon the inner surface of the back of the chamber and seed box, and is connected with the lower end of a handle which slides upon the outer surface of said back by two bolts. The bolts pass through a longitudinal slot, formed in the back of the planter and through a block or blocks placed in the said slot. The block or blocks keep the bar and handle at the proper distance apart, and also prevent the side edges of the bar from wearing the sides of the chamber.

IMPROVED CORN-GUARD FOR PLOWS.

Edward B. Murphy and Charles D. Bramell, South Point, Mo.—This is an improved device for attachment to the beams of plows to prevent soil and clods from being thrown against the young plants. It is a hollow cylindrical casting, made with its outer end closed, and upon the upper and lower sides of which are formed lugs to receive bolts which pass above and below the plow beam and through the ends of a bar placed upon the other side of the said beam, so as to clamp it between the said casting and bar. A spring holds the guard plate down to the ground and, at the same time, allows it to rise to pass over an obstruction. The device may be attached to the beam of a shovel plow, a turn plow, or any other desired kind of a plow.

IMPROVED CORN PLANTER.

H. William Meyerhoff, Waverly, Iowa.—This invention relates, first, to the means for changing the angle of the tongue to the frame of the planter, for the purpose of varying the depth at which the furrow-openers deposit the seed in the ground; secondly, to the mechanism for reciprocating the seed slides, and the arrangement of a clutch for throwing the same into, and out of gear with one of the transporting wheels; and, thirdly, to making the driver's seat adjustable by a particular construction.

IMPROVED PLOW.

Daniel P. Ferguson, Jonesborough, Ga.—This invention is an improvement in the class of plows having pivoted adjustable standards, and it relates to the employment of a curved or angular notched brace for the plow standard, and a weighted key for confining the brace. The invention further relates to the provision of a slotted stay-piece for preventing the share or shovel turning on the bolt by which it is attached to the standard.

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Wanted—The address of Manufacturers of Small Patented Articles, such as Toys, etc. S. Potts, W. E. S. "Intrepid," Navy Yard, New York.

Lithographic Stone Grinders. Simplest, cheapest, and best in use. Send for illustrations and testimonials. Frank Thomas & Co., Home St., Cincinnati, O.

Steam Yachts for sale, new, 14 feet long, 4 feet beam, 2 1/2 h. p., \$250; 18 feet long, 4 1/2 feet beam, 1 h. p., \$355; 21 feet long, 5 1/2 feet beam, 2 h. p., \$425. Shipping weights 450, 800, and 1,200 lbs. Will carry comfortably 4, 8, and 12 persons. Send for particulars. S. C. Forsaith & Co., Manchester, N. H.

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Diamond Planers. J. Dickinson, 64 Nassau St., N. Y.

For Sale—33" Lathe, \$350; 5 ft. Planer, \$290; 25" Lathe, \$190; 26" Lathe, \$290; at Shearman's, 132 N. 3d St., Philadelphia, Pa.

Iron Circular Saw Tables. An incomparable tool for shop work. Prices reduced. Illustrated circulars. Paterson, N. J. W. H. Havens.

For Sale—21 in. 10 ft. Lath, \$190; 17 in. 8 ft. do., \$175; 16 in. 10 ft. Wheeler do., \$225; 18 in. 5 ft. do., \$95; all back geared and screw cutting. 2 No. 5 Steam Pumps, \$75 each; 5 ft. Whitcomb Planer, \$325. Shearman, 132 N. 3d St., Philadelphia, Pa.

New Steam Yacht for sale, 35' x 6' 10"; also Yacht Engines, Propellers, etc. Wm. J. Sanderson, 21 Church St., Syracuse, N. Y.

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600 New and Second-hand Portable and Stationary Engines and Boilers, Saw Mills, Wood Working Machines, Grist Mills, Lathes, Planers, Machine Tools, Yachts and Yacht Engines, Water Wheels, Steam Pumps, etc., etc., fully described in our No. 11 list, with prices annexed. Send stamp for copy, stating fully just what is wanted. Forsaith & Co., Machine dealers, Manchester, N. H.

For Sale—Combined Punch and Shears, and Engine Lathes, new and second-hand. Address Lambertville Iron Works, Lambertville, N. J.

Gas lighting by Electricity, applied to public and private buildings. For the best system, address A. L. Bogart, 702 Broadway, N. Y.

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Solid Emery Vulcanite Wheels—The Solid Original Emery Wheel—other kinds imitations and inferior. Caution.—Our name is stamped in full on all our best Standard Belting, Packing, and Hose. Buy that only. 'The best is the cheapest.' New York Belting and Packing Company, 37 and 38 Park Row, N. Y.

Amateur Photographic Apparatus, Chemicals, etc. Complete outfits, \$5 to \$25. E. Sackmann & Co., manuf., 278 Pearl street, near Fulton street, New York.

Consumption Cured.—An old physician retired from active practice, having had placed in his hands by an East Indian missionary the formula of a simple vegetable remedy for the speedy and permanent cure for Consumption, Bronchitis, Catarrh, Asthma, and all Throat and Lung affections, also a positive and radical cure for Nervous Debility and all nervous complaints, after having thoroughly tested its wonderful curative powers in thousands of cases, feels it his duty to make it known to his suffering fellows. Actuated by this motive, and a conscientious desire to relieve human suffering, he will send, free of charge to all who desire it, this recipe, with full directions for preparing and successfully using. Sent by return mail by addressing with stamp, naming this paper, Dr. J. C. Stone, 32 North Fifth Street, Philadelphia, Pa.

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

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

Shingle Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

Skinner Portable Engine Improved, 2 1/2 to 10 H. P. Skinner & Wood, Erie, Pa.

A half price—line cold-rolled shafting; 425 feet, 2 1/2 to 4 inch, with hangers and taper sleeve couplings; good as new. Address Taper Sleeve Coupling & Wooden Pulley Works, Erie, Pa.

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Notes & Queries

It has been our custom for thirty years past to devote a considerable space to the answering of questions by correspondents; so useful have these labors proved that the SCIENTIFIC AMERICAN office has become the factotum, or headquarters, to which everybody sends, who wants special information upon any particular subject. So large is the number of our correspondents, so wide the range of their inquiries, so desirous are we to meet their wants and supply correct information, that we are obliged to employ the constant assistance of a considerable staff of experienced writers, who have the requisite knowledge or access to the latest and best sources of information. For example, questions relating to steam engines, boilers, boats, locomotives, railways, etc., are considered and answered by a professional engineer of distinguished ability and extensive practical experience. Inquiries relating to electricity are answered by one of the most able and prominent practical electricians in this country. Astronomical queries by a practical astronomer. Chemical inquiries by one of our most eminent and experienced professors of chemistry; and so on through all the various departments. In this way we are enabled to answer the thousands of questions and furnish the large mass of information which these correspondence columns present. The large number of questions sent—they pour in upon us from all parts of the world—renders it impossible for us to publish all. The editor selects from the mass those that he thinks most likely to be of general interest to the readers of the SCIENTIFIC AMERICAN. These, with the replies, are printed; the remainder go into the waste basket. Many of the rejected questions are of a primitive or personal nature, which should be answered by mail; in fact, hundreds of correspondents desire a special reply by post, but very few of them are thoughtful enough to inclose so much as a postage stamp. We could in many cases send a brief reply by mail if the writer were to inclose a small fee, a dollar or more, according to the nature or importance of the case. When we cannot furnish the information, the money is promptly returned to the sender.

A. B. W. should put his questions as to saw and shingle machines into comprehensible language.—T. J. P. will find directions for setting a boiler on p. 339, vol. 33.—J. G. E. and many others are informed that there is no formula for the horse power of a boiler.—E. L. N. will find directions for the decalcification process on p. 275, vol. 34.—O. C. S. can get the devices on china ware. See p. 43, vol. 29.—R. T. C. does not give sufficient data as to the wire becoming brittle by exposure to the atmosphere.—T. W. will find directions for making oxygen on p. 75, vol. 32.—A. H. (of Niedergründ, Bohemia) can cut gas retort carbon with a hand saw.—L. F. C. should give his tinsplate a coat of oil paint, and let it dry. He can then fasten cloth to it with waterproof glue; see p. 43, vol. 32. For a description of the compound engine, see p. 243, vol. 32.—D. McL. will find on p. 218, vol. 34, directions for making the so-called eggs of Pharaoh's serpents. Asbestos is regularly advertised in our columns.—W. G. W. will find directions for nickel plating on p. 235, vol. 33.—J. O. F. will find instructions for making friction matches on p. 75, vol. 29.—C. W. will find a recipe for a cement for mending crockery and glass on p. 379, vol. 32. For mending leather shoes, see p. 119, vol. 28; for mending rubber boots, see p. 203, vol. 30.—H. C. B. is informed that tattooed marks on the arms are done with gunpowder or Indian ink. For removing the marks, follow the directions on p. 331, vol. 30.—S. H. will probably find that any good cheese, that is soft, will do to make cement.—S. will find that the cement described on p. 80, vol. 31, does not dissolve in water and does not become brittle with age.—J. M. McG., Jr., should read Paddlefast's articles on boat building in the SCIENTIFIC AMERICAN SUPPLEMENT.—H. R. can dissolve rubber by the process described on p. 119, vol. 28.—J. W. S. can sensitize a piece of paper or metal by the process described on p. 132, vol. 35. As to changes of color by heat, see p. 201, vol. 36. As to a weather glass, see pp. 35, 67, vol. 36.—P. does not give sufficient data as to the hammering in his boiler.—W. C. P. is informed that the preparation is to be taken internally. The human hair is referred to in the question.—T. S. will find directions for fastening rubber to iron on p. 409, vol. 33.—S. R. C. will find a description of a gyroscope on p. 91, vol. 31.—T. K. & B. should know better than to believe in the possibility of an instrument indicating where gold lies buried in the earth.—C. W. K. is mistaken as to the horse power of the engine. See p. 33, vol. 33.—W. T. K. can bleach ivory by the process described on p. 10, vol. 32.—W. S. will find answers to all his queries as to lightning rods on p. 277, vol. 35.—H. R. will find directions for silver-plating without a battery on p. 299, vol. 31.—R. M. will find a formula for the power of an engine on p. 33, vol. 33.—A. I. will find on p. 123, vol. 31, directions for bluing gun barrels.—W. A. W. will find something on the expansion of mercury by heat on p. 354, vol. 26.—O. B., A. G., A. J. B., J. C., R. D. E., F. J. W., N. B., A. P. Q., F. J. N., R. B., C. W., F. C., W. L. McL., A., C. A. R., D. H., H. L., and many others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) W. W. H. asks: Please tell me the ultimate weight that the two following girders will bear? One is a cast iron girder, nearly of the Hodgkinson proportions, 7 inches wide at base and 8 1/4 inches high; and the other is a wrought iron girder or flat bar size, 5 inches x 3/4 inch. Both girders being fixed and anchored in strong walls, and the span 20 feet. Please give an arithmetical and not an algebraic calculation. A. Calculated by the usual formulas, the center breaking loads would be: Cast iron beam, about 3,000 lbs., wrought iron beam, about 2,300 lbs.

(2) F. A. B. asks: What is the weight of a missile, and the greatest distance that the bolt could be thrown by the large Krupp gun, that was on exhibition at the Centennial? A. Weight of ball, 1,200 lbs. Probable range, between 4 and 5 miles.

(3) F. B. asks: 1. As a boy swings a bucket of water over his head and it does not fall out, how fast would a 10 foot flywheel with globular cavities on inside rim facing center of wheel have to turn to hold balls of any substance dropped or placed in them? Would there be a different effect if the balls were composed of different materials, as wood, stone, or iron? A. About 25 revolutions a minute, whatever the material. 2. On the principle of a top, a heavy wheel can be turned readily after starting. What difference will it make if, instead of a wheel, it should be as a large governor with heavy balls on arms 8 or 10 feet long, and how much more power would have to be expended to raise those balls on a spiral incline to near the level of their attachments? A. The height of the balls varies as the square of the revolutions. 3. Suppose a perpendicular shaft, moved by cog or belt gears, had four or more balls suspended by chains instead of stiff arms, would they not assume a similar position? A. Yes, other things being the same. 4. Suppose a tube arranged to turn and describe a circle, with outer end closed, but with an opening below, no wider than the cross section of tube, but giving perpendicular surface enough for a ball to rest against, if the ball could be held there by springs or otherwise until great velocity was acquired and then released, would it not remain there? A. Yes, as we understand your meaning. 5. I have seen a performer manipulating a top which at one time appeared to turn when standing out at right angles from the perpendicular stick that supported it. What held it up? A. Centrifugal force, which was enough to overcome the attraction of gravitation. 6. Does such a top weigh any less acting in that position than when at rest? A. No; it weighs just as much when revolving as when not.

(4) H. T. P. asks: Which has the most steam-generating capacity, and which is capable of the greatest resistance, a single boiler 60 inches in diameter and 18 feet long, or two boilers each 36 inches in diameter and 18 feet long? A. Generally, the two smaller boilers would make the most steam and sustain the greatest pressure.

(5) A. S. D. says: I have a canal about two miles long, which I use as a head race for water power. It runs along the foot of a hill and heavy rains wash dirt into it. How can I clean it out without drawing off the water? A. It would probably be necessary to use a dredging machine.

(6) W. O. R. asks: What is meant by the pitch of a steamer's propeller being 3 feet? A. It means that, if the propeller were working without slip, like a screw in a nut, the vessel would advance 3 feet at each revolution.

(7) J. A. O. Q. asks: Does not the Great Eastern consist of three complete ships? A. No; but the vessel is built with a double hull, and is divided by bulkheads into several compartments.

(8) W. D. S. says: Three men want to carry a bar of iron 9 feet long, weighing 300 lbs. One man carries an end. At what distance must the other two place a bar so that an equal weight (or 100 lbs.) will fall on each man? A. Three feet from the other end of the bar, if it is uniform in section.

(9) J. T. H. asks: Is tallow a good lubricant for cranks making 200 revolutions? Would oil be better? A. Oil is generally better than tallow for crank pins, and there are some special forms of lubricants that answer very well for crank pins and journals moving at a high velocity. In an engine (double and vertical) 9 x 12 inches, making 200 revolutions, with a band wheel 4 feet in diameter by 14 inches face and 3 inches thick, would there be any danger of breaking the wheel by placing a weight sufficient to balance weight of pistons? A. We think there will be no danger in attaching the counterbalance.

(10) W. M. K. says: What is the rate of increase of friction in proportion to speed of a thin smooth body (such as a propeller blade) in passing through water? What proportionate amount of power would be required to double any given number of revolutions of a fixed submerged screw propeller? A. Within moderate limits, the power is supposed to vary approximately as the cube of the number of revolutions, but the exact law of the variation is not definitely settled; and when the speed becomes very great, the power is supposed to increase in a higher ratio than the cube, but experiments have not been sufficiently extended to establish a general law.

(11) G. B. says: Two bodies of metal of equal weight are to slide over a planed surface. One of these bodies has a bearing surface (supposed to be a perfect friction contact), upon the table it slides on, of 6 square feet; the other body has a bearing surface of only 6 square inches. Will it require more power to slide the body having 6 square feet bearing than it will to slide the one having only 6 inches, or will the required moving power be equal? A. According to the commonly accepted law, the friction depends upon the weight and not upon the area of contact. This rule, however, has some limitations, especially when the area of contact is so small that the pressure per square inch is sufficient to produce abrasion.

(12) H. D. M. asks: Is the phosphorus lamp described on p. 266, vol. 31, of any use? A. The phosphorus lamp may be made and used as directed in the answer, but the light which it emits is extremely weak—a mere phosphorescent glow. It is sufficient, however, in a damp atmosphere, to illuminate the dial of a watch, held close to it, so that with ordinary eyesight the time may be noted in the absence of other luminants without much difficulty.

(13) S. asks: Is there anything that will erase India ink lines from drawing paper? A. Nothing that we know of, except a good steel eraser or sanded rubber.

(14) R. H. & Co. say: 1. In our business we use brads with malleable cast iron heads, for the support of lightning rods, and we galvanize them to prevent rusting. When we use them, we find the cast iron so brittle that a great many of them break. We can come to no other conclusion than that the galvanizing makes them brittle. Are we right? A. Galvanizing

iron does not make it brittle. 2. Is it necessary to throw articles that are galvanized into cold water immediately after taking out of the vat? A. No. They should not be thrown into cold water.

(15) B. F. A. asks: How can I stain wood blue, the shade of the field in the American flag? A. Brush it over with a strong, hot solution of nitrate of copper in water, and then go over the work with a hot solution of carbonate of soda (2 ozs. to 1 pint water). 2. Boil 1 lb. indigo, 2 lbs. wood, and 3 ozs. alum in 1 gallon water, and apply with a brush.

(16) C. M. T. asks: What will make photograph paper so transparent that it can be painted in oil colors on the back of a picture, so as to give a life-like color to the picture, or what preparation will make the paper perfectly transparent? A. Try Canada balsam. Paper cannot be made perfectly transparent—only translucent.

(17) C. D. H. says: Our water supply is from springs, and is soft. About two years ago, plain iron pipes were laid; and the 1 inch pipes have become so filled with a very hard rust or scale as to nearly cut off the supply. It forms in irregular masses, and adheres very firmly to the pipe. Is there any known method of preventing or removing the same without taking up the pipe? A. We do not know of any practical method for accomplishing this.

(18) C. K. asks: Can a good polish be put on copper by the recipe given on p. 326, vol. 32, and will it last a reasonable time? A. The recipe has been well recommended. It is better to use a larger proportion of alcohol than is there indicated. See also p. 242, vol. 34.

(19) B. C. M. asks: How is pyroligneous acid (wood vinegar) made? A. It is obtained by distilling wood in iron retorts, resembling those used for making illuminating gas. The condensed products of the distillation contain, with tar and numerous other bodies, crude pyroligneous acid or wood vinegar, amounting in a well conducted distillation to about 7 or 8 per cent of the wood employed. The gas that accompanies the liquid distillates is conducted to the furnace under the retort, and serves to continue the distillation without other fuel. In purifying the acid, it is first saturated with lime, evaporated to dryness, roasted at a moderate temperature so as to free it from volatile matters, and decomposed in a retort, having a helm of copper and a condenser of tin or silver, with hydrochloric acid (90 parts acid to 100 acetate of lime), and the acetic acid distilled.

(20) G. B. L. says: I built an oil house last fall, and lined it inside with inch boards, packing space between inside and outside boarding with pine sawdust. The oils on hand are coal oil, linseed, fish, elephant, seal, etc., also turpentine and benzine. The leakage from barrels seems to have thoroughly saturated the floor, and most likely the sawdust has absorbed whatever came in contact with it. Is there any danger of spontaneous combustion during the heat of summer? A. Yes, it is dangerous.

(21) A. H. says: Your correspondent, P., p. 212, vol. 36, seems to overlook the fact that a lightning rod having the deep earth terminal generally recommended by scientific authority, and which he does not favor, would, at the same time, have all the advantages (?) of a rod terminating "at or just beneath" the surface, such as I understand him to recommend. For, before reaching the deep terminal, the rod would come in contact with the surface of the earth; and if the electricity find there or elsewhere a better conductor, the greater portion of it would leave the rod for that conductor, instead of following the rod to the end. With a properly constructed rod, terminating with an extensive metal surface, buried in contact with such worthless scraps of metal as the clippings from tinshops, old tinware, etc., or fine charcoal, or both, in constantly (not "almost always, during a thunderstorm") moist earth, which in many instances would be most easily found in the cellar bottom: there is little probability that the electricity will leave the rod to "pass off on the wet surface" or do damage.

(22) J. P. says, in reply to D. W.'s query as to the sudden welding of a millstone spindle to its step: In the New York Journal of Commerce, in the first year or two of its publication, may be found an account of a similar occurrence. A spindle (I think it was of a millstone) was suddenly welded to the support upon which it was running, in the very same manner, as in the case mentioned in your paper. I believe it occurred in the year 1827, or the first half of 1828.

(23) W. D. says, in reply to D. W.'s query as to the welding of a millstone spindle to its step: I have seen this done a good many times. To prevent it, plane a groove in the step 1/2 inch wide and 1/4 inch deep; harden the foot of the spindle and step as hard as possible, polish both after hardening, and you will have no trouble about welding together. The oil running through the groove prevents its welding. Use the best of sperm oil, and keep the step level.

(24) W. W. T. says, in reply to the query about the welding of mill points to their steps: I have had several such jobs to repair. The weld is perfect, and has always broken when struck in a different place from the point of union. I have to anneal the step and turn off the part of point left; and I find no check or line marking the place of contact.

(25) B. A. J. says, as to the sudden welding of a mill spindle to its step: I once had a spindle act in the same way while running in a cup of oil.

(26) W. C. says: Please give me a recipe for making powder for mining coal? A. Coarse-grained gunpowder is usually employed. The materials are first perfectly dried and separately reduced to impalpable powders. These are then sifted together, moistened with water, and ground for some time between large millstones kept constantly moist with water. The wet powder is then collected into large lumps and carefully dried. These lumps are grained by bringing them in contact with sharp teeth fixed upon the periphery of a revolving wheel, and agitating in suitable sieves to separate from the finer powder. The powder consists of 76 parts of niter, 13 parts of charcoal (often mixed with a little wood pulp or sawdust), and 11 parts of sulphur.

(27) J. R. Y., Jr., asks: Please give me a recipe for a wash that will remove or hide marks and stains on hard finished house walls.

(28) C. D. R. asks: Please give me recipes for making turpentine japan or paint dryer, benzine japan or paint dryer, and rubbing varnish for cabinet makers' use?

(29) J. H. R. asks: What is the advantage of placing the high pressure cylinder of a marine compound engine directly above the low pressure cylinder?

(30) W. K. D. says: I have an acquaintance who has an open fireplace in his office, and claims that during the forenoon the sun comes into the room and deadens the fire.

(31) J. A. C. says: I have a boiler made of first class iron, which commenced leaking in one of the joints. This continued until every joint was leaking.

(32) W. E. W. asks: 1. How can I tell the weight of a flywheel where I know the diameter, width of face, and thickness of same?

(33) J. E. C. says: I see it stated in an article on machine belts, in the SCIENCE RECORD for 1876, p. 331, that a belt wrapped one quarter round a pulley has only one fourth the power of what it would have if wrapped one half round.

(34) M. A. W. asks: 1. Will a steam boiler 4 feet long by 24 inches diameter, with a firebox 40 inches high, 16 inches wide, and 20 inches long, with 36 one inch flues, be large enough to run an engine with a cylinder, 3 x 6 inches, with 80 lbs. boiler pressure at 200 revolutions per minute?

(35) C. A. C. asks: 1. How can I varnish a colored mechanical drawing, so that the paper and drawing will not be marred by the operation?

(36) L. M. C. says: I am nineteen years of age, and my ambition is to learn to be a competent practical locomotive engineer.

1. Will high pressure steam produce a higher note on a steam whistle than low pressure steam on the same whistle? A. Generally, yes.

(37) J. O. says, in reply to D. W.'s query as to the sudden welding of a mill spindle and its step piece: I have had a similar experience in the uniting of hardened steel under excessive friction, due to the absence of lubricant.

(38) J. H. P. says, as to the welding of the spindle to the step plate: I think that the end of the spindle had worn a little hollow in the step plate, having the same curvature with itself.

(39) F. D. H. says: The statement of D. W. as to the welding of a mill spindle point to its step can be verified by three precisely similar cases, which have been brought to us for repairs.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined, with the result stated:

J. A. S.—It is iron pyrites or sulphide of iron. See p. 7, vol. 36.—W. R. S.—A quantitative analysis of fire clay, etc., would cost about \$15.

COMMUNICATIONS RECEIVED.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

On the Valuation of Sugar. By S. W. On the Involute of the Circle. By L. D'A.

HINTS TO CORRESPONDENTS.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Hundreds of inquiries analogous to the following are sent: "Who makes dynamometers? Where can silkworms' eggs be obtained? Who makes brewers' machinery? Who sells tobacco-flavoring composition?"

OFFICIAL.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending

April 3, 1877, AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

A complete copy of any patent in the annexed list, including both the specifications and drawings, will be furnished from this office for one dollar.

Table listing inventions such as Agitating and mixing, Agricultural boiler, Air guns, Animal poke, Arm rest, Ax helve shield, Bag holder, Bale eye former, Bale tie, Bales, tightening bands on, Barrels, trussing, P. Beamer, Baths, hot air and other, T. Keech, Bed bottom, spring, T. R. Jones, Bee hive, H. Wheaton, Beerkegs with soda, supplying, J. J. Schillinger, Belts on pulleys, throwing, R. Reinhard, Binder, temporary, G. W. Emerson, Bird cage, A. E. Mook, Blind slot worker, E. C. Whipple, Bobbin, J. Dawson, Boiler bottom, C. R. Everson, Boiler furnace front, G. L. Allen, Bolt heading machine, A. F. Jackson, Boot heel stiffener, Moore & Rogers, Boot heel stiffener, N. J. Simonds, Boot stiffeners, making, N. J. Simonds.

Table listing inventions such as Boot shank support, G. W. Wells, Boots and shoes, lacing, N. Evans, Breech-loading firearm, I. M. Earle, Brick machine, C. Schlickeysen, Bridge, Avery & Bartholomew, Bridge pier, Avery & Bartholomew, Bridge pier, E. E. Colby, Bridle, G. M. Strong, Broom machine, C. E. Lipe, Buckle, F. W. Schafer, Burial case, E. Mets, Burial casket, A. Fischer, Butter cutter, Dugan & Moncrief, Butter dish, W. H. Fitch, Butter for packing, W. B. Bemis, Butterpail, J. Gilberts, Button fastening, S. A. Hazelton, Cam motion, Houghtaling & Siviter, Cane and umbrella, M. M. Copp, Car axle lubricator, W. Palmer, Car coupling, J. Hayden, Car coupling, M. L. Mathias, Car heater, G. W. Dismar, Car pusher, H. La Tourette, Car starter, W. Jasper, Card board, ornamental, Adams & Bett, Carriage, portable engine, C. M. Miller, Carriage seat lock, Hayward & Hays, Cartridge, A. B. Smith, Cartridge shells, varnishing, Pratt & Reynolds, Cast iron into steel, converting, C. W. Siemens, Casting metals, C. & E. H. Dusenbury, Centrifugal dryer, etc., J. Buchanan, Jr., Chair and work table, G. L. Rich, Cigar wrapper, W. Broseker, Clevis, Coonley & Buckius, Clock lockwork, J. W. Williams (r), Clothes drier, J. Kahn, Clutching device, H. Fuchs, Cocks and faucets, closing, Towle & Plass, Coffee mill, protector, etc., W. A. King, Coffee pot, R. L. Nelson, Coffee roaster, N. Metz, Coin detector, counterfeit, J. A. Thompson, Cointray, A. A. Hyde, Collar, standing, J. K. P. Pine, Cooling liquids, A. D. Puffer, Cork, or bung for cans, etc., T. Tully, Corn ball presser, C. E. Vankeuren, Corn drill, D. Kerschner, Corn planter, D. C. Bacon, Corn planter, H. Wagoner, Corn planter, hand, W. E. Seelye, Cornsheller, H. Neubert, Cotton press, C. J. Beasley, Cotton press, G. C. McKee, Cotton press, J. Templeton, Cotton seed planter, R. Ball, Crucibles, making plumbago, W. Smith (r), Culinary vessel, H. C. Milligan, Cultivator, fallow, J. Richardson, Dental plugger, K. L. Mills, Die for sucker rod joints, G. Douglas, Door handle and catch, W. C. Folant, Dynamo-electric machine, D. F. J. Lontin, Eavetrough fastener, A. J. Gilbert, Egg carrier, W. J. H. Kappe, Electro-magnetic regulator, R. A. Hayes, Engine, high and low pressure, T. L. Jones (r), Envelope, R. C. Carter, Eyeglass, I. H. Johannes, Feathering paddle wheel, H. Williams, Feed water heater, B. Eynon, Felly, W. A. Wharton, Fence post, J. R. Pemey, Fence post tip, D. C. Morris, Fence wire barbed, O. O. Kittleton, Fence wire, barbed, J. McNeill, Flat iron heater, S. B. Dinsmore, Flux, composition, C. F. Secor, Friction clutch, M. Rumely, Furnace grate, B. Hershey, Furnaces, supplying air to, W. Halsted, Gas making, illuminating, J. Absterdam, Gas, making illuminating, J. Rigby (r), Gas retorts, raking, T. F. Rowland (r), Gas retorts, charging, T. F. Rowland (r), Gear wheels, making, J. Comly (r), Gimlets and twist drills, J. C. Richardson, Ginger snaps, making, Bell & Hills, Glass pipe coupling, H. P. Humphrey, Glass shades, etc., making, J. Bourne, Governor, J. W. Collet, Governor, stop motion, L. Skinner, Grain binder, Hodges & Blim, Grain binder, C. B. Withington, Grain elevator, floating, C. W. Mills (r), Grain separator, N. Kibler, Grain separator, E. F. Osborne, Grate bar, E. Stroh, Grinding machine, G. A. Knowlton, Hammers, die for, Kip & Rieckel, Harrow, E. T. Bousfield, Harvester, O. N. Skaaraas, Harvester reel, E. L. Phipps, Hay elevator, J. & P. Lux, Hay elevator and conveyer, J. R. Moran, Hay for fuel, winding, E. Harding, Hinge for boxes, etc., A. F. Gerald, Hoe, O. H. Hicks, Hoisting machine, D. H. Merritt, Horse blanket, J. C. Ayres, Horse collar, H. W. & C. F. Whitney, Horse hay fork, P. Grant, Horseshoe, C. W. Atkinson, Horseshoe nail plates, beveling, J. M. Laughlin, Horseshoe nails making, J. M. Laughlin, Horseshoe nails, making, G. L. Hall, Hose bridge, J. Taylor, Hose coupling, A. E. Rich, Hydrocarbon furnace, B. Hershey, Ice tool, J. Crawford, Injector, J. Proeger, Inkstands, filling and emptying, I. M. Fisher, Insulated wire, H. Redding, Ironing table, G. W. Hook, Ironing table, T. Libby, Knife scourer, P. Hanersperger, Knife scouring pan, Cassel & Zint, Knob latch, W. A. Barlow, Knobs, to shanks, attaching, W. A. Barlow, Knobs to spindles, attaching, W. D. May, Labeling machine, Knoch & Salomon, Lamp, W. A. Butler, Lamp, S. S. Newton, Lamp bracket, Sherwin & Hoople, Lamps, center, Sherwin & Hoople, Lamp for hydrocarbon oils, etc., D. McCarty, Lamp, night, H. W. Huntington, Lamp or chandelier, oil, J. F. Lauth, Lampscreen holder, J. E. Hubbell, Lampshade holder, H. L. Ives, Lard cooler, W. P. Harvey.

Table listing inventions such as Last, C. E. Cree, Lathe chuck, F. Armstrong, Lead furnace bottom, T. Bisch, Leather goods, stamping, L. H. Urner, Level, T. H. Burk, Lightning rod, L. D. Vermilya, Lock for sliding doors, W. C. Rogers, Lock, master key, F. C. Yanda, Locking latch, H. A. Chase, Meat tenderer, V. Lapham, Millstones, etc., balancing, C. E. Benade, Moulding machine, J. B. McCune, Mosquito net frame, J. F. Volle, Nail plate feeder, W. Koplin, Nut lock, T. Vernon, Oil stone holder, G. W. Dudley, Packing, piston, W. Rankin, Paint composition, S. B. Fisher, Paper bag machine, C. A. Nixon, Paper barrel machine, F. N. Davis, Paper boxes, L. P. Heath, Paper perforating, R. T. Smith, Parlorskate, H. L. True, Pencil sharpener, Roache & Redding, Pianoforte action, upright, F. Frickinger, Pictures, etc., preserving, L. T. Luther, Pile driver, steam, T. T. Loomis (r), Pitman rod, B. E. Carpenter, Plaiting machine, T. Hagerty, Plow, J. Preston, Plow, R. B. Thomson, Plow, clearing attachment, J. F. Dock, Plow mould boards, C. Blair, Plows, corn guard for, Murphy & Bramell, Plowshares, making, C. H. Thompson, Portraits, incasing pocket, J. R. Applegate, Press metal drawing, O. Smith, Projectile, D. Kennedy, Railway switch, S. H. Finch, Railways, clamp for rope, W. Eppelsheimer, Register and punch, N. A. Ransom, Rein holder, Hall & Richardson, Rod coupling, W. C. McClintock, Rolling blanks for rod joints, G. Douglass, Rolling rings, and cylinders, R. A. Carter, Rope clamp, Caier & Powell, Rope clamp, H. T. Smith, Rope making machine, L. E. Higby, Rowlock, T. S. Poppelwell, Safe, provision, E. Webb, Sash balance, Kolb & Osberghaus, Sash fastener, W. T. Doremus, Sash fastener, H. Jones, Sash fastener, W. E. Sparks, Sash holder, R. Holcroft, Sawtooth, insertible, T. S. Disston, School desk, Cogger & June, Scythe snath fastening, M. Smith, Sewing machine motor, Artley, Berg, & Dieterlea, Sewing machines, button holes, E. Moreau, Shaft coupling, G. A. Chapman, Sheet metal elbow, N. I. Rothan, Shingle, metal, Locher & Knispel, Sicklegrinder, H. S. Stevens, Silk, etc., dressing, C. Corron, Skirt, J. Mark, Skirt supporter, W. W. Towson, Slate, F. W. Mallett, Slate washer, R. De Haven, Smoking pipe, B. A. Jonasson, Snap hook, Nash & Kempshall, Soap composition, Baxter & Horrocks, Spark arrester, E. M. Johnson, Stamp, perforating, G. F. Almy, Station indicator, J. H. Herzog, Steam and air brake, Taylor & McCamish, Steam boiler, drop tube, C. K. Heath, Steam boilers, fire box, B. Hershey, Steam engine governor, S. A. West, Steam radiator, G. W. Blake, Stop cock locking case, H. C. Meyer & Co. (r), Stove, looking, E. P. Morong, Stove, heating, E. Stewart, Stove oil, H. P. Malone, Stovepipe wall thimble, C. Streit, Sugar boiling pan, etc., W. Clough, Table leaf support, W. F. Daly, Telegraph, dial, R. J. Sheehy, Telegraph multiple, G. Smith, Telegraphy, automatic, J. W. Brown, Thill coupling, T. J. Hubbell, Time globe, I. P. Juvet, Tire heating apparatus, S. G. Reed (r), Tobacco pipe, J. Davis, Tool holder, T. Strobridge, Towel rack and wall protector, E. Pullan, Traveling bag, safety, H. Collins, Treadle, W. B. Floyd, Truck, brick yard, E. Remillard, Truck, garbage, J. O. A. Bennett, Trucks, etc., gripping attachment, Thomas et al., Valve, Mann & Owens, Valve, automatic check, O. Collier, Valve, balance slide, T. M. Nagle, Valve, steam pump, N. W. Wheeler, Vapor burner, F. A. Lyman, Vehicle, side bar spring, J. F. Bridget, Ventilator, G. R. Moore, Ventilator, kitchen, J. A. Leeper, Ventilator, railway car, S. Darling, Vessels, relieving stranded, H. F. Knapp, Wagon brake lock, S. H. Miller, Wagon seat spring, B. F. Wells, Weed destroyer, J. A. Lees, Well tubing anchor, etc., Wanner & Yonkers, Windmill, D. Nysewander, Windmill, E. Stata, Window blind, J. Miller, Window mirror, P. W. Ralfs, Window screen, R. Calhoun, Wood oil for glue, H. Thaulow, Wringer, L. Sternberger.

DESIGNS PATENTED. 9,873.—CORSET.—M. Adler, New Haven, Conn. 9,874 to 9,876.—CARPETS.—A. Baye, London, England. 9,877.—DISHS.—E. Boote, New York city. 9,878.—TYPES.—J. M. Conner, Greenville, N. J. 9,879.—STOVES.—R. A. Culter et al, Peoria, Ill. 9,880.—CARPETS.—E. Daniels, Paris, France. 9,881.—MOTTO.—J. W. Fleischmann, Williamsburg, N. Y. 9,882.—HANGES.—F. T. Fracker et al, New Britain, Conn. 9,883 to 9,886.—NECKLACE.—G. F. Gleason, Newark, N. J. 9,887.—CHAIRS, ETC.—H. F. Goodwin, Sheboygan, Wis. 9,888.—CHAIR FRAME.—A. G. Hofstatter, New York city. 9,889.—OIL CLOTHS.—J. Hutchinson, Newark, N. J. 9,890.—STOVES.—O. B. Keeley, Spring City, Pa. 9,891.—PIPE.—J. F. Starr, Jr., Camden, N. J.