

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

Portable and Stationary Engines; Boilers of all kinds; 45 Cordlandt St., N. Y. Erie City Iron Works, Erie, Pa.

Lubricene.—A Lubricating Material in the form of a Grease. One pound equal to two gallons of sperm oil. R. J. Chard, New York.

Situation Wanted by a Machinist and Engineer, experienced as foreman. Address Draughtsman, 547 Lafayette Ave., Brooklyn, N. Y.

Best Turbine Water Wheel, Alcott's, Mt. Holly, N. J.

Best Steam Pipe & Boiler Covering. P. Carey, Dayton, O. Foot Lathes, Fret Saws, &c., 90 pp. E. Brown, Lowell, Ms.

Sperm Oil, Pure. Wm. F. Nye, New Bedford, Mass.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

North's Lathe Dog. 347 N. 4th St., Philadelphia, Pa.

Kreider, Campbell & Co., 1030 Germantown Ave., Phila., Pa., contractors for mills for all kinds of grinding.

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

Boilers & Engines cheap. Lovegrove & Co., Phila., Pa.

Punching Presses, Drop Hammers, and Dies for working Metals, etc. The Stiles & Parker Press Co., Middle town, Conn.

Wanted.—A Combined Power Punch and Shears for light work. 209 West 33d street, N. Y.

Do your own Nickel and Silver Plating. Outfits, with Batteries and Solutions complete, \$5 and upwards. Union Silver Plating Co., Princeton, Ill.

Wanted.—Articles to Manufacture in the Hardware or Machinery line, on royalty or by contract. D. J. Miller, Mohawk, N. Y.

All kinds of Saws will cut Smooth and True by filing them with our New Machine, price \$2.50. Illustrated Circular free. E. Roth & Bro., New Oxford, Pa.

Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable; and easily worked. Tensile strength not less than 45,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Expectant Advertisers will serve their interests by consulting C. K. Hammett's Advertising Agency, 206 Broadway, N. Y.

Sets of Steel Stamp Figures, $\frac{1}{8}$ in. to $\frac{1}{4}$ in., \$1.00; Alphabets, \$3.00; warranted. G. M. York, Cleveland, O.

For Sale.—Root Safety Boiler, 17 Horse; good order; cheap. Inquire Swift Brothers, Millbrook, N. Y.

Extra Fine Taps and Dies for Jewelers, Dentists, and Machinists; in cases. Pratt & Whitney Co., Manufacturers, Hartford, Ct.

If Mr. T. R. S., of Query No. 12, page 410, date June 29, will send his name and address to Wm. S. Dean, Box 600, Hornellsville, N. Y., he can learn something very much to his advantage.

"The Best Mill in the World," for White Lead, Dry, Paste, or Mixed Paint, Printing Ink, Chocolate, Paris White, Shoe Blacking, etc., Flour, Meal, Feed, Drugs, Cork, etc. Charles Ross, Jr., Williamsburgh, N. Y.

Warranted best and cheapest Planers, Jointers, Universal Woodworkers, Band and Scroll Saws, etc., manufactured by Bentel, Margedant & Co., Hamilton, Ohio.

Patent Wood-working Machinery, Band Saws, Scroll Saws, Friezers, etc. Cordesman, Egan & Co., Cincinnati, O.

The only genuine Geiser Self-regulating Grain Separator. Address the Geiser Manuf. Co., Waynesboro' Franklin Co., Pa.

Manufacturers of Improved Goods who desire to build up a lucrative foreign trade, will do well to insert a well displayed advertisement in the SCIENTIFIC AMERICAN Export Edition. This paper has a very large foreign circulation.

Safety Linen Hose and Rubber Hose, all sizes, at reduced rates. Greene, Tweed & Co., 18 Park Place, N. Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing metals. E. Lyon & Co., 470 Grand St., N. Y.

Alcott's Turbine received the Centennial Medal.

Nickel Plating.—A white deposit guaranteed by using our material. Condit, Hanson & Van Winkle, Newark, N. J.

Cheap but Good. The "Roberts Engine," see cut in this paper, June 1st, 1878. Also horizontal and vertical engines and boilers. E. E. Roberts, 107 Liberty St., N. Y.

The Cameron Steam Pump mounted in Phosphor Bronze is an indestructible machine. See ad. back page.

Empire Gum Core Packing, Soap Stone Packing, in quantities to suit. Greene, Tweed & Co., 18 Park Place, N. Y.

Presses, Dies, and Tools for working Sheet Metals, etc. Fruit and other Can Tools. Bliss & Williams, Brooklyn, N. Y., and Paris Exposition, 1878.

The SCIENTIFIC AMERICAN Export Edition is published monthly, about the 15th of each month. Every number comprises most of the plates of the four preceding weekly numbers of the SCIENTIFIC AMERICAN, with other appropriate contents, business announcements, etc. It forms a large and splendid periodical of nearly one hundred quarto pages, each number illustrated with about one hundred engravings. It is a complete record of American progress in the arts.

Diamond Self-clamp Paper Cutter and Bookbinders' Machinery. Howard Iron Works, Buffalo, N. Y.

For Sale.—One Large Circular Saw Mill; will saw logs 75 feet long. Very Heavy Iron Frame. Sell Cheap. E. P. Bullard, 14 Dey street, New York.

Bound Volumes of the Scientific American.—I will sell bound volumes 4, 10, 11, 12, 13, 16, 28, and 32, New Series, for \$1 each, to be sent by express. Address John Edwards, P. O. Box 773, New York.

For Power & Economy, Alcott's Turbine, Mt. Holly, N. J. Dildine's Self-setting Cattle-trap Traps. Best out for Catching Mice, Rats, Rabbits, etc. Sample Trap by Mail. Agents Wanted. John Dildine, Milton, Pa.

Wanted.—A Steam Road Locomotive. Manufacturers send circulars to Derastus Spencer, Jr., Corinne, Utah.

Improved Wood-working Machinery made by Walker Bros., 73 and 75 Laurel St., Philadelphia, Pa.

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

For Heavy Punches, Shears, Boiler Shop Rolls, Radial Drills, etc., send to Hilles & Jones, Wilmington, Del.

Dead Pulleys, that stop the running of Loose Pulleys and Belts, taking the strain from Line Shaft when Machine is not in use. Taper Sleeve Pulley Works, Erie, Pa.

Pulverizing Mills for all hard substance and grinding purposes. Walker Bros. & Co., 23d and Wood St., Phila.

2d hand Planers, 7' x 30", \$300; 6' x 24", \$225; 5' x 24", \$200; so. cutt. b'k g'd Lathe, 9' x 28", \$300; A. C. Stebbins, Worcester, Mass.

J. C. Hoadley, Consulting Engineer and Mechanical and Scientific Expert, Lawrence, Mass.

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.

NEW BOOKS AND PUBLICATIONS.

THE RAILWAY BUILDER. A handbook for estimating the probable cost of American railway construction and equipment. By William J. Nicolls, C.E. Henry C. Baird & Co., Publishers, 810 Walnut st., Philadelphia. Price, postpaid, \$2.

A handy little work in pocket book form, containing information of a practical character derived from the author's experience and from various standard authorities. Clearly and concisely written, well illustrated, and in general a useful guide to the railway engineer.



(1) D. writes: In these times of base ball matches, will you please give your readers the rationale of the "curved ball," about which we hear so much? A. See SCIENTIFIC AMERICAN, No. 20, vol. 37, November 17, 1877.

(2) W. Y. asks: If I were to take two amalgamated zinc plates, each 6 inches square, and two copper plates, each 6 inches square, and place each pair in a separate earthen vessel containing diluted sulphuric acid, and connect the zinc of one pair with the copper of the other, would the battery thus made be strong enough to plate metals and make electrotypes? A. Yes.

(3) M. H. W. wishes to know if there is anything to keep animal liquid from stinking. A. Carbolic or salicylic acid.

(4) W. F. asks: Can you tell me what will dissolve zinc without evolution of gas? A. You may try a strong aqueous solution of ferric chloride or solution of potassium bichromate or permanganate mixed with strong solution of ammonium chloride (preferably hot) acidified with a few drops of nitric acid. Cupric chloride solution deposits copper in place of a portion of the zinc dissolved. Also by making the zinc plate (first superficially amalgamated with mercury) the anode of a couple in dilute sulphuric acid or strong aqueous solution of ammonium chloride, using a moderately active electric current from a separate battery, or by exposing the plate (in either of the liquids mentioned) as one of the positive plates of such a battery.

(5) S. E. asks: Can a fresh egg be preserved by coating it with any substance which will exclude the air? A. Yes, for a time. Gum arabic, shellac, and paraffin are used. The Germans apply linseed oil. See SCIENTIFIC AMERICAN, p. 75 (24), vol. 37, and SUPPLEMENT No. 65, p. 1030.

(6) O. W. S. asks: 1. What are the properties of the metal aluminum? Is it rigid or stiff metal? Will it resist strain tending to bend it? A. Yes. It has, when pure, about the hardness of silver and tensile strength of copper. 2. Is it brittle? A. It is not brittle. 3. Will it run freely when melted? A. It melts at about 1,300° Fah., rather slowly when pure, but flows easily and may be cast. 4. Is it solid, not porous, when cast? A. See pp. 798, 1213, 1337, and 1635, SCIENTIFIC AMERICAN SUPPLEMENT.

(7) C. T. R. asks: Is the carbon in the carbon telephone graphite, or some other form of carbon? A. It is lampblack collected from burning kerosene or other light hydrocarbon. It is compressed into a button under great pressure.

(8) J. H. asks (1) for a recipe for making birdlime. A. Boil the middle bark of the holly 7 or 8 hours in water, drain it, and lay it in heaps in the ground, covered with stones, for 2 or 3 weeks, till reduced to a mucilage. Beat this in a mortar, wash it in rain water, and knead it till free from extraneous matters. Put it into earthen pots, and in 4 or 5 days it will be fit for use. An inferior kind is made by boiling linseed oil for some hours until it becomes a viscid paste. 2. Give length of time it will remain fit for use when exposed to heat of sun. A. We do not know.

(9) R. C. B. asks for a recipe for exterminating red ants. A. Dissolve some camphor in a small quantity of methylic alcohol, precipitate it by addition of water, and project a little of the suspended camphor into their haunts. A very small quantity of carbolic acid used in a similar manner will answer as well or better—especially if the solution contains glycerin. Tobacco water and powdered borax are also said to be effectual.

(10) W. D. H. writes: I unfortunately spilt a solution of iodine (in alcohol) over the page of a valuable book. The paper composing the book is not glazed, but rather coarse. How am I to remove the iodine without injury to the book? A. Apply solution of pure sodium hyposulphite, and then strong ammonia water, by means of blotting paper; remove excess by pressing between sheets of bibulous paper moistened with water, and dry between clean watm (dry) blotting pads.

(11) D. F. writes: In drying white shirts in the drying room of a laundry we use the waste heat from the furnaces on which the ironers heat their smoothing irons, the furnaces being located on the floor below the drying room, and the hot air passes constantly from the furnaces through heat flues to the floor above. But there go up with the hot air minute particles of dust and ashes which oil the shirts. Can you suggest any way to overcome this difficulty? A. Place on your furnaces heating drums having a great number of air flues which are in communication with the external air and also with the drying room. Allow the products of combustion to pass around the air flues.

(12) S. R. S. asks: How long does it take benzene to be saturated with fat, and must it be heated to become so? Must it be distilled to be separated from the fat, or must the mixture be pressed? I have tried distillation, which resulted in the cork being expelled from the bottle, and as I had the bottle in a water bath no harm resulted. I am anxious to make the experiment, yet have no desire to risk an explosion with such a dangerous substance as benzene. A. Heat your heavy oil over a water or sand bath for some time, and you will doubtless recover the fatty matters. We would not advise you to risk the "distillation" of benzene in a corked bottle. For information respecting the construction of apparatus for distilling, etc., consult any elementary work on chemistry. Your druggist will perhaps loan you books. A strong solution of the dry fatty matters in benzene may be made at ordinary temperatures in ten minutes, if properly agitated together.

(13) J. H. M. asks: What kind of oil is used to thin printer's ink, so as to work on the stencils made by the electric pen? A. A little nut oil or a "varnish" prepared by igniting the boiling oil, and allowing it to blaze, while constantly stirred for a short time.

(14) H. S. T. asks: 1. Are anodes now made of pure nickel? A. The nickel plates sold as pure nickel contain small quantities of carbon, presumably as carbide of the metal. 2. In forming sulphate of nickel, will it do to use metal instead of oxide of nickel? A. Yes, but not very well; it would require the application of heat; the oxide is much cheaper. 3. How is an oxide of nickel formed? A. There are two oxides of nickel. The monoxide (NiO) is prepared by heating the nitrate to redness or by precipitating a soluble nickel salt with caustic alkali, and washing, drying, and igniting the apple green hydrated oxide. The sesquioxide (Ni₂O₃) is prepared by passing chlorine through water holding the hydrated monoxide in suspension. It is also produced by mixing a soluble salt of nickel with solution of bleaching powder (calcium hypochlorite). The former oxide is of most importance.

(15) D. R. writes: Will you please tell me of any compound that could be moulded to make an imitation of rubber (hard) or coral? A. Vulcanized fiber or celluloid has been used successfully. See p. 10, vol. 38, and pp. 147 and 204 (73), vol. 37, SCIENTIFIC AMERICAN.

(16) J. W. McM.—Telescopic specula are parabolic and not elliptical. We do not know that disks of speculum metal are in market. The constituents of speculum metal are copper 66.6 parts, tin 33.4 parts. For optical works, write to an industrial publisher.

(17) C. W. writes: Will you inform me as to the proportions of bisulphuret of carbon and chloride of sulphur used in vulcanizing rubber, by what is known as the cold process, and the manner of applying and time required? A. The caoutchouc is simply immersed for a short time in a mixture of 40 parts of carbon disulphide and one of sulphur chloride; then transferred to a room heated to 70° Fah., until the sulphide has evaporated, when it is boiled in a solution of 1 lb. of caustic soda and 2 gallons of water, and then thoroughly washed. Benzolene, the lighter product of the distillation of petroleum, has been used in place of carbon sulphide.

(18) C. H. M. writes: 1. We are taught in our works on physics that when an electrical current passes through a direct or right hand helix, which incloses a magnet, if the current flows from right to left it determines the poles of the magnet in a fixed direction relative to the flow of the current. If the current be reversed the poles will also be reversed. If a permanent magnet be surrounded by an insulated wire, and a current of electricity be passed through the wire in a direction contrary to the harmony of magnetic polarity and electrical currents, the effect is first to demagnetize the bar and then reverse its poles by remagnetizing it by induction, in a contrary direction to that which it possessed before the current began to flow. How can these facts be reconciled with the use of permanent magnets in the Bell telephone? A. The current induced in the helices is so slight that it is doubtful if this alone would affect the power of the magnet. The Bell telephone as now constructed has a soft iron core projecting from the end of a compound bar magnet for receiving the helix. This core serves as an armature to the magnet, and as a preventive of demagnetization. 2. How is gas carbon prepared to mould into different shapes, or made into pencils or sticks for use in galvanic batteries? A. They are made by calcining in an iron mould an intimate mixture of coke and bituminous coal, finely powdered and strongly compressed.

(19) E. M. B. asks for the name of any work in which he can find "spontaneous combustion" specifically treated. A. See article on the subject by Joseph Williams, SCIENTIFIC AMERICAN SUPPLEMENT, No. 32.

(20) W. A. writes: I am running 18 inch saws, and do what I will the boxes will heat. Until recently I ran them at a speed of 2,400 revolutions per minute. I slowed them down to 2,050, and still they seem to heat just as bad. I was using a poor class of Babbitt and thought that was it. I bought some of the best I could buy, and still they heat. A. Either your boxes are out of line or the mandrel is sprung or out of round, or the boxes are too short. We would recommend truing the mandrel in a lathe, and the use of longer boxes, which must be rigidly mounted.

(21) F. S. asks: Can you tell me how the liquid bronze is made that is sold in shoe stores for

bronzing shoes? A. It is made by dissolving aniline red in thin alcoholic shellac varnish. Add the aniline until you get the bronze effect.

(22) C. B. T. writes: Can you say anything about potato flour in your "Notes and Queries"? A. The potato flour used by confectioners and Hebrews is simply fine potato starch reduced to flour in a mill similar to that used for flouring wheat.

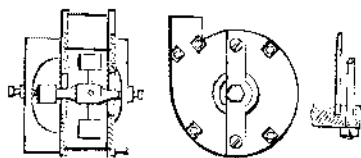
(23) "Nails" asks how to copper iron articles, such as nails, etc. A. Clean the iron by pickling it in dilute oil of vitriol and tumbling in a barrel, with sand if necessary; then bring them into contact with a strong aqueous solution of copper sulphate.

(24) A. M. H. asks: Do you know any good recipe for making fly paper that fastens them to the paper? Boiled linseed oil and sugar are the materials used, we believe.

(25) Y. O. asks: What kinds of paper and what process are used to manufacture changeable paper flowers, which change their color according to the atmosphere? A. Saturate the paper with a moderately concentrated solution of cobalt chloride in rain water.

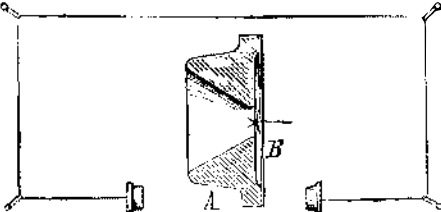
(26) M. A. D. writes: I am troubled with superfluous hair and I want to get rid of it. How can I do it? A. Böttger recommends the following: 1 part, by weight, pure crystallized sodium sulphhydrate, and 3 parts of fine purified chalk; rub well together, moisten with water, and apply a layer the thickness of a knife blade. It should be allowed to remain in contact with the flesh not more than two or three minutes to avoid injury to the skin. Depilatories of this kind destroy the vitality of the hair. We do not recommend their use. If the materials are impure the skin may be stained.

(27) C. M. B. asks: How can I construct a small pressure blower, suitable for a sand blast? A. Make two wooden side pieces of the form shown in the side elevation. Cut a groove in each to receive the sheet iron strip which forms the curved sides. Turn a wooden shaft. Insert metal bearing pieces in its ends. Bore four holes in the hub and insert four arms with fans attached. Support the shaft on pointed screws inserted in the cross pieces attached to the side pieces. Clamp the side pieces to the edges of the sheet iron by means of small bolts. We give dimensions below: Di-



ameter of case, 6 inches; thickness of case inside, $2\frac{1}{4}$ inches; size of opening in sides, $2\frac{1}{4}$ inches; size of fans, $1\frac{1}{2} \times 2$ inches; discharge opening, $1\frac{1}{2} \times 2\frac{1}{2}$. The size and proportions may be varied. A fan of this sort will answer for the sand blast or for a small forge, but if it is to be used continuously the shaft should be iron or steel and it should be run in well made boxes.

(28) P. B., W. B. P., and others.—A cheap and effective acoustic or thread telephone may be made by turning from wood a mouthpiece, A, and attaching to it a disk, B, of ferrotype plate. The mouthpiece should be $2\frac{1}{4}$ inches in its largest diameter, and should have an annular surface $\frac{1}{4}$ inch wide for receiving the disk, B, which is attached by means of sealing wax. The wax is first applied to the wood, and the disk is warmed and pressed against the mouthpiece. The disk is $2\frac{1}{4}$



inches in diameter. The portion left free to vibrate is $1\frac{1}{4}$ inch in diameter. The larger internal diameter of the mouthpiece is $1\frac{1}{4}$ inch, the smaller $\frac{1}{4}$ inch. There is a small hole in the center of the diaphragm for receiving the thread, which also passes through a small piece of soft rubber and is knotted. The telephone thread must be supported on small elastic bands which must be put under tension. The string must also be taut. By means of this arrangement sound may be conducted at any desired angle, the elastic rubber supports being arranged as shown at the corners of the engraving. Whispers and even breathing may be distinctly heard over a long distance. When talking loud the receiving instrument should be removed 2 inches from the ear.

(29) H. W. A. writes: In your issue of July 6, Mr. Edison describes the arrangement of a "free lever resting on the receiving diaphragm, which answers very well for calling purposes at telephone stations where there is comparatively but little noise." Can anything of the kind be applied to the Bell telephone? A. Something similar has been applied to the Bell telephone.

(30) E. I. asks: 1. What metal is used as a positive electrode in coating copper with iron? A. Iron. 2. What composition is used in making a mould from steel plate engravings for electrotyping? A. Gutta percha, wax, fusible metal, or plaster of Paris. Gutta percha is probably the best.

COMMUNICATIONS RECEIVED.

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

Motors. By D. E. P.
Steam Yacht. By G. F. S.
Potato Disease, etc. By T. C.
An Invention Wanted. By W. G. S.
The Use of Mechanism. By J. B. and T. B. McC.
Quantitative Psychology. By J. M. M.
What is the Sun composed of? By T. B. McC.

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

E. W. D.—Consists principally of orthoclase, quartz, and hornblende.—**E. A. H.**—No. 1 is chert or flint. It is not a quartz pseudomorph after wood, as supposed. No. 20 is anhydrite. No. 3 is a limestone somewhat resembling that used for lithographic purposes. No. 89 is calcite. No. 300. The fossil shell was too mutilated for classification. No. 11 is an impure limestone. No. 173 is orthoclase containing seams of muscovite. No. 214 is calcite colored with iron. No. 194. These fossils will be referred to hereafter. No. 83 is a specimen of an extinct genus of the family *Mollusca*, of which the genera *Avicula*, *Perna*, and *meleagrina* are representatives.—**W. P. E.** and **J. E. H.**—It is the pollen of the common white pine (*Pinus strobus*).—**S. S.**—It is principally ferrous sulphate and alum.—**A. M. K.**—It is iron sulphide and arsenide—mispickel.—**G. M. H.**—It is nodular iron pyrites.—**L. S. S.**—No. 1 is hornblende and quartz. No. 2 is hornblende schist, containing ferro-pyrite with a trace of nickel and arsenic.—**J. L. F.**—It is chalcedony—a variety of quartz.—**G. H. M.**—It contains iron sulphide and copper sulphide—chalcopyrite. The ore may be of some value.

HINTS TO CORRESPONDENTS.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Inquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

[OFFICIAL.]

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending May 21, 1878, 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. In ordering, please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city.

Amalgamator, Hobart & Steward	203,916
Animal trap, G. W. McMillan	204,064
Animal trap, S. Snell	204,102
Auger, well, J. T. Glass	204,025
Awning, J. Koenig	203,923
Bag holder, J. L. Conway	203,891
Balances, compensation, C. V. Woerd	203,976
Barrel, L. L. Hansen	203,824
Batting or wadding, folding cotton, W. Lewis	204,058
Bed bottom, M. Stansel	204,104
Beastead, invalid, J. Goodwin	204,026
Beehive, O. Colvin	203,890
Beehive, I. Parke	203,937
Beehive, G. S. Walton	204,115
Belt, endless carrying, T. M. Healey	203,825
Belt, electro-galvanic, E. E. Jacobsen	204,835
Belting rubber, H. R. Barber	203,990
Bending machine, sheet metal, W. T. Holland	204,043
Bending plumb's traps, E. A. Leland	203,842
Bird cage, E. Weissborn	203,970
Blackboard, H. W. Eastman	204,011
Blanks, arranging, DeKamp & Bradley	203,897
Blower, fan, R. Waskey	203,966
Boiler covering compound, G. C. Fowler	203,906
Boiler, steam, B. T. Babbitt	203,986
Bolt and nut, H. A. Harvey	204,036
Bolt heading machine, C. B. Allen	203,982
Boot and shoe burnishing machine, C. J. Aday (r)	8,246
Boots, manufacture of, Miller & Creighton	204,068
Bottle stopper, D. E. Stevens	204,105
Box fastener, O. Geier	203,907
Bracket fastening, L. Van Praag	203,964
Brake for elevators, C. H. Mitchell	204,069
Brake and halter, J. McKibben	203,929
Bronzing machine, J. O. Kurtzmann	203,841
Bungstave lock, J. Kirby	203,922
Button, D. B. Waite	204,114
Can, jacket, F. C. Wilson	204,119
Can or vessel for liquids, J. P. Adams	203,868
Candle, electric, L. R. Longworth	203,844
Candler, E. Norton (r)	8,249
Car coupling, A. Elliott	204,013
Car coupling, J. H. Hills	203,912
Car coupling, link guide for, A. M. Miller	203,846
Car heater, W. M. Jackson	203,968
Car, railway, R. L. & C. W. Dabney, Jr.	204,009
Car transfer apparatus, R. H. Ramsey	204,087
Cars, motor for street, J. F. Kelley	204,052
Carpet cleaning machine, J. Rae	203,853
Cartridge loading device, H. Watkeys	203,967
Cartridge package, J. W. Frazier	204,017
Cement, making hydraulic, C. F. Dunderdale (r)	8,237
Chair attachment, rocking, J. Zangerle	203,979
Chair, barber and dental, G. W. Archer	203,983
Checking apparatus, J. Casey	204,004
Cheese vat, Smith, Freeman & Burrell	203,952
Cheroot machine, A. & J. Marengo	203,926
Churn, L. Cutshaw	204,008
Churn motor, G. W. Jones	204,049
Churn motor, W. A. Morgan	204,071
Cigar box, S. H. Hewlett	204,040
Cigar tip cutter, G. Ohmer	204,074
Cigars, apparatus for bundling, W. A. Abbott	203,867
Cigarette for medical purposes, D. Wark	203,861
Clothes pounder, G. M. Smith	204,101
Coffee, etc., making extracts of, B. Schmitz	204,069
Coffee roaster, J. Miller	204,067
Column, fireproof, P. B. Wight	203,972
Condensing vessel, E. D. Bangs	203,873
Copperas, red colors from, W. Peterson	203,936
Cordage, exhibitor for, H. E. Richards	203,854
Corn shellers, cob elevator for, H. H. Eby	204,012
Corsets, manufacture of, A. Felthelmer (r)	8,244
Curtain roller and bracket, Buckley & Sawyer	204,001

Cutlery, table, E. Cady	204,002
Dental gold filling, B. G. & L. Kearsing	203,921
Dental tool, E. T. Starr	203,858
Derrick, wagon, J. D. Winters	203,974
Desk, school, J. P. Pies	204,082
Dough, preparing, M. Meinhold	204,065
Draught equalizer, M. A. Andrews	203,871
Drawer support, J. W. Dane	203,894
Dredger, vacuum, A. Crosby	203,892
Drying machine, G. N. Bliss	203,879
Earth closet, R. W. Riddle	203,943
Educational appliance, C. A. Bailey	203,888
Egg tester, C. L. Westerman	204,117
Electrical conductors, tip for, J. A. Nickerson	203,931
Elevator boot, Caldwell & Watson	203,887
Elevator, grain, O. D. Spalding	204,103
End gate, wagon, S. W. Perkins	204,079
Engine, steam, J. Baird	203,989
Engine, wind, L. Brayman	203,884
Engine, wind, J. Hollingsworth	204,044
Engraving block, G. C. Setchell	203,856
Exercising machine, W. H. Willcox	203,973
Fare register, J. Bluemel	203,881
Fence post, Caneby & Leach	204,003
Fence wire, W. C. Payne	203,938
Filter, drive well point, M. J. Eich	203,900
Fireescape, J. M. Lescale	204,057
Flower vase, F. Ratcliff	203,939
Fly trap, D. S. Kilder	204,053
Fork, horse hay, J. H. Harter	204,035
Fountain, drinking, J. Reid	203,941
Fruit basket, A. P. Gibson	204,023
Fruit box, A. P. Gibson	204,022
Funnel, self tapping can, A. W. P. Ladd	203,924
Furnace for desulphurizing pre. C. Olsted	204,075
Furnace, heating, D. L. Jaques	203,836
Gas apparatus, H. D. Fitch	204,016
Gas apparatus, J. Hanlon	203,909
Gate, A. B. Clayton	204,005
Glass, ornamenting, Cochum & Hermann	203,838
Glove, corn husking, C. M. Townsend	203,959
Glucose, manufacturing, N. Pigeon	203,935
Grain drier, P. Provost	203,933
Grain masher, L. A. De Lime	203,819
Grain separator, T. Barnes	203,874
Grain separator, C. Wood	203,864
Graining machine, G. Pelstring	204,078
Halter, Puller & Warren	204,084
Harness attachment, T. B. Hand	203,823
Harness, metal loop for, D. A. Johnson	203,919
Hatchway, elevator, J. A. Marker	204,062
Hay tedder, S. Perry	204,080
Heel and sole trimming machine, J. H. Busell (r)	8,229
Hinge, J. A. House	204,045
Hinge, W. S. Mains	204,061
Hoop machine, G. B. Selden	203,949
Hop picking machine, H. H. Hatheway	203,910
Horse collar, metallic, J. C. Smith	203,950
Hot air, utilizing, S. C. Salisbury	204,094
Hub attaching device, J. C. Hendry	203,911
Hydrocarbon generator, etc., C. Holland	203,828
Hydrocarbon generator and lighter, C. Holland	203,832
Hydrocarbon vapor generator, etc., C. Holland	203,826, 203,827, 203,829, 203,830
Hydrocarbons, extracting, W. Adamson	203,980
Indicator for steam engines, pressure, J. Rae	204,086
Indicator, station, S. W. Colton	203,889
Inkstand, F. Klingspor, Jr.	204,054
Iron, etc., melting and treating, G. W. Swett	203,957
Ironing table, A. T. Gale	204,019
Knapack, H. C. Merriam	204,063
Knife, hay, D. L. Garver	204,020
Knife, paring, J. M. Wilhelm	203,862
Labels, etc., machine for counting, C. E. Sawyer	204,027
Ladder, fire escape, J. J. Lucas	204,059
Lamp, B. B. Schneider (r)	8,250
Lamp, D. Whiteford	203,971
Last blocks, trimming, J. C. Kingston	203,840
Lathe for turning masts, etc., H. Kean	203,920
Lead cutter, Phillippo & Owen	203,850
Leaf turner, Vincent & McMillan	203,962
Leather, etc., coloring and sizing, E. Andrews	203,810
Letter sheet and envelope, C. L. Riker	203,825
Lock, J. Klinzing	204,055
Lock for doors, extension, J. Moore	204,070
Lock, sash, G. B. Sarchet	204,026
Lock, seal, E. J. Brooks	203,956
Loom, H. D. Davis	203,895
Lubricant, C. Johnston	203,839
Lubricator, vehicle axle, L. Espenschied	203,821
Lumber-drying apparatus, R. P. Johnson (r)	8,240
Milk compound, C. C. Wainwright	203,965
Milk, vessel for setting, J. W. Powers	203,852
Mill, grinding, J. Mills	203,930
Mill, grinding, A. N. Wolf	204,121
Millstones, device for leveling, etc., J. T. Beckwith	203,878
Moccasin, J. G. Pitts	203,851
Mouldings, machine for veneering, J. A. Dayton	203,896
Needle wrapper, B. M. Thomas	203,958
Netting, machine for making, W. J. Squire	203,857
Newspaper wrapping, etc., machine, P. A. Chaifant	203,888
Nut lock, R. Ely	204,014
Oils, extracting, Adamson & Simonin	203,981
Ore separator, P. Plant	204,083
Ore washer, C. O. Bagley	203,872
Organ stop action, G. R. Ellis	203,901
Organs, tremolo attachment for, J. H. Potter	203,932
Overshoes, attachment to rubber, J. W. Baker	203,813
Painting canvas, machine for, W. Levin	203,843
Paper and other fabrics, pasting, J. Callier	203,886
Paper box, G. A. Dunn	203,899
Paper cutting machines, drum for, W. E. Hudson	203,833
Paper felt and other fabrics, finishing, W. Seranton	204,100
Paper or cloth, finishing surfaces of, C. E. Sawyer	204,098
Paper pulp from wood, manufacture, W. R. Patrick	204,077
Paper pulp, preparing wood fiber for, J. C. McIntyre	203,928
Paper weight and copy holder, D. Zimmer	203,866
Pen holder, J. Hoffman	204,041
Pen, writing, L. B. Bertram (r)	8,242
Piano forte, C. F. T. Steinway	204,108
Piano forte action, C. F. T. Steinway	204,107
Piano forte aggraffa, C. F. T. Steinway	204,109
Piano forte, grand, C. F. T. Steinway	204,106
Piano fortes, capodastro frame, C. F. T. Steinway	204,111
Piano fortes, sounding board, C. F. T. Steinway	204,110
Pin, brooch, J. Jenkins	204,047
Pipe, cement and asphaltum, M. Allen	204,069
Pipe joint, water, F. P. Hallberg	204,023
Planing machine, J. B. D. Leavitt	204,056
Planter, corn, G. W. Brown	203,997
Planter, corn, D. & D. F. Luse (r)	8,245
Planter, corn, A. & M. Runstetter	204,093
Planter, cotton, W. S. Turner	203,960
Planter, seed, W. C. Smith	203,951
Plow stock, I. J. Saunders	203,948
Plow, sulky, J. B. Fisher	203,908
Plow, sulky, W. C. Rogers	204,001
Press, baling, J. R. Blossom	203,890
Press, shingle, R. A. Stahn	203,955
Propellers, bearing for screw, J. Baird	203,875
Pump, J. S. Seal	203,814
Pump, T. Dowling (r)	8,243

Pump for oil wells, steam, H. W. Faucett	204,015
Railway crossing, J. H. Sparkes	203,953
Railway, portable, N. W. Condict, Jr.	204,007
Railway track, portable, N. W. Condict, Jr.	204,006
Rake, hay, A. Rigby	204,090
Refrigerating milk wagons, P. T. Weir	203,969
Rice hulling machine, W. C. Howard	203,917
Rivet, M. Bray	203,815
Rivets, machine for inserting, T. Boardman	203,882
Rudder for canal boats, J. Supple	203,859
Saddle, harness, Standish & Bailey	203,854
Salve, J. G. Muller	203,848
Sash fastener, J. M. Keech	204,051
Sash, window, I. T. Dyer	203,820
Saw grinding machine, S. Bevan	203,993
Saw mill carriage, H. Groves	203,908
Scales, weighing, F. Fairbanks	203,902
Scoop, A. Burton	203,855
Screw cutting die, Grant, Sawyer & Gardner	204,028
Screw cutting die, G. R. Stetson	203,956
Screw machine, metal, C. D. Rogers	203,946
Screw threads, die for cutting, M. C. Johnson	204,048
Sewing machine, J. L. Follett	203,904
Sewing machine tuck creaser, I. M. Rose (r)	8,236
Shafts, bearing for, D. Hyde	204,046
Ships, construction of, J. Rees	203,940
Shirt, P. B. Pickens	204,081
Shoe tip, J. W. Hyatt	203,834
Shovel, fire A. Bardell	203,991
Shutter bow and fastener, T. B. Rogers, Jr.	203,945
Slate cleaner, reservoir, A. W. Overbaugh (r)	8,241
Soap, A. H. West	204,116
Sower, fertilizer, C. F. Johnson, Jr. (r)	8,247
Speed recorder, mechanism for, W. W. Wythe	203,865
Spinning machinery bearings, F. J. Habbeth	204,085
Spring, wagon, W. L. Williams	203,863
Square, dressmakers', J. F. Wingate	204,120
Stamp, hand, B. B. Hill	203,915
Stamp, hand canceling, B. T. Hill	203,914
Stamp, rubber pocket, S. W. Garrison	204,021
Stencil plate, A. C. Barnes, Jr.	203,992
Stone polishing machine, Pitkin & Dougherty	203,934
Stove, camp, C. P. Vollbrecht	203,963
Stove, cooking, D. Stuart	204,112
Stove or lamp, oil, E. Blackman	203,994
Stoves, milk, G. W. Robertson	203,944
Strainer, self, H. More	203,847
Street sweeping machine, H. W. Richardson	203,942
Stud, shirt or sleeve, Salmon & Delavere	204,095
Suspensory bandage, S. E. G. Rawson	204,058
Syringe, flexible, M. Mattson (r)	8,238
Tablets, cover for holding, H. Willson	204,118
Tanks, man hole cover for oil, W. H. Brock	203,817
Tanks, manhole cover for petroleum, W. H. Brock	203,816
Tassel, W. Officer	204,073
Tea case, J. A. Anderson	203,870
Telephone, speaking, W. Gillett	204,024
Telephone, speaking, E. Gray	204,027
Telephone, speaking, J. J. McTigue (r)	8,248
Tempering & lubricating, composition for, J. Park	204,076
Tiles, machine for making, etc., A. H. Austin	203,811
Time detector, watchman's, J. C. Marvil	204,063
Tobacco, device for marking plug, H. C. Holbrook	204,042
Tobacco germ, J. Woods	203,978
Tongue and thill support for vehicles, O. P. Tripp	204,113
Toy bank, D. J. MacLean	203,927
Track cleaner, W. T. Gruntler	204,081
Track cleaner, G. Royal	204,092
Trading pit, R. S. Jennings	203,837
Tree protector, T. Doak	203,898
Trunk fixture, C. A. Taylor	203,860
Trunk, sectional, F. Van Sieten	203,961
Truss, M. M. Macdonald	204,060
Twine holder, J. Hill	203,913
Underdrain, W. Henning	204,038
Valve for hydrants, etc., P. H. Donahoe	204,010
Valve, puppet, H. F. Frisbie	204,018
Valve, steam, J. Saunders	203,947
Vegetable cutter, J. L. Boyle	203,883
Vehicle, side spring, A. Wood	203,977
Velocipede, S. P. Watt	203,968
Wagons, netting for unloading, J. D. Winters	203,975
Wash bench, C. Barlow	203,877
Wash boiler, J. J. Hall	204,034
Washing machine, C. & A. W. Guyer	204,032
Washing machine, Hess & Newton	204,039
Wastetrap, D. Healy	204,037
Watch, D. A. A. Buck	204,000
Watch escapement, D. A. A. Buck	203,999
Watch plate, D. A. A. Buck	203,998
Water gate or stop valve, A. C. Austin	203,985
Water meter, oscillating, A. C. Austin	203,812
Water meter, piston, H. L. Arnold	203,984
Watermeter, piston, J. Barnes	203,876
Water wheel gate, J. S. Ladow	204,050
Wheel and axle, car, D. M. Cummings	203,893
Whipsocket and rein holder, H. W. Neal	204,072
Windlass, wire cable, J. P. Manton	203,845
Wire coiling machine, C. E. Green	204,030
Wool washing machine, W. H. Bradley	203,995
Wrench, carriage, G. W. Remington	204,089
Wrench, pipe, D. Fisher	203,822
Wringing machine, I. Copeland	203,818
Zinc, treating ores of, E. A. Parnell	203,849

TRADE MARKS.

Burnishing ink, J. Henry Dwyer.....	6,117, 6,118
Cigars, C. Claudius.....	6,096
Cigars, J. D. Loomis.....	6,099, 6,100, 6,101
Cigars, cigarettes, etc., McCoy & Co.....	6,102
Cigars, W. Simpson.....	6,126
Chemical preparations, New York Chemical Works.....	6,093
Chewing and smoking tobacco, Frishmuth Bro. & Co.....	6,119
Clocks, H. J. Davies.....	6,116
Coloring butter, Wells, Richardson & Co.....	6,129
Drugs and chemicals, W. S. Powell.....	6,110
Dry goods, The Edgelyne Manufacturing Co.....	6,127
Edge tools, The Collins Company.....	6,111, 6,112
Flour, G. B. Woodman.....	6,130
Gunpowder, Miami Powder Company.....	6,094
Hams, Troth Brothers.....	6,095
Leather, R. Woolley & Sons.....	6,128
Lubricating oil or compound, G. Binns, Jr.....	6,104
Medicinal preparation, Caswell, Hazard & Co.....	6,097
Medicinal preparation, H. H. de Petterren.....	6,096
Medicinal preparation, Relief Manufacturing Co.....	6,103
Medicinal preparation, C. R. Burrage.....	6,107
Medicinal preparation, Atkins, Hertel & Co.....	6,114
Medicinal preparation, T. S. Bradford.....	6,115
Medicinal preparations, W. H. Whitney.....	6,106
Medicinal tonic, R. Van Buskirk.....	6,113
Mustard, spices, etc., W. J. Fell.....	6,091
Needles, J. Thornton & Co.....	6,105
Nursing bottles, Hagerty Brothers & Co.....	6,121
Plug chewing tobacco, P. McNamara & Co.....	6,108
Plug chewing tobacco, Wilson & McCallay.....	6,123
Remedies for coughs, colds, etc., A. C. Simpson.....	6,125
Roasted and ground coffee, etc., Burns & Byram.....	6,108
Sarsaparilla extracts, R. F. George.....	6,120
Watches, Lake Shore Watch Company.....	6,122
Whisky, C. F. O'Donnell.....	6,124