

TO INVENTORS.

An experience of more than thirty years, and the preparation of not less than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. In addition to our facilities for preparing drawings and specifications quickly, the applicant can rest assured that his case will be filed in the Patent Office without delay. Every application, in which the fees have been paid, is sent complete—including the model—to the Patent Office the same day the papers are signed at our office, or received by mail, so there is no delay in filing the case, a complaint we often hear from other sources. Another advantage to the inventor in securing his patent through the Scientific American Patent Agency, it insures a special notice of the invention in the SCIENTIFIC AMERICAN, which publication often opens negotiations for the sale of the patent or manufacture of the article. A synopsis of the patent laws in foreign countries may be found on another page, and persons contemplating the securing of patents abroad are invited to write to this office for prices, which have been reduced in accordance with the times, and our perfected facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN.

1857-1879.

OFFICE OF

R. J. Chard, Manufacturer of Oils, &c., 134 MAIDEN LANE, NEW YORK.

Dear Sir:—The premises occupied by us for so many years having become too limited for our business, we have removed to No. 6 Burling Slip (within a block of the old stand), where we shall be pleased to meet our old customers. Thanking you for past favors, and trusting, with increased facilities, to merit a continuance of the same, we remain,

Your obedient servant, R. J. CHARD.

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.

The best results are obtained by the Imp. Eureka Turbine Wheel and Barber's Pat. Pulverizing Mills. Send for descriptive pamphlets to Barber & Son, Allentown, Pa.

Valves and Hydrants, warranted to give perfect satisfaction. Chapman Valve Manuf. Co., Boston, Mass.

For Punches, Patent Bending-Rolls, Radial Drills, and Angle Iron Shears, Hillis & Jones, Wilmington, Del.

The Asbestos Roofing is the only reliable substitute for tin, it costs only one-half as much, is fully as durable, and can be easily applied by any one. H. W. Johns Mfg. Company are the sole manufacturers.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. The Railroad Gazette, 73 Broadway, New York.

Magnets, Insulated Wire, etc., for experiments. Catalogue free. Goodnow & Wightman, 176 Washington St., Boston, Mass.

For Second-hand Engine Lathes, apply to Witherby, Rugg & Richardson, Worcester, Mass.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

A. H. Downer's Improved Boiler Liquid removes scale without injury, thereby saving fuel and increasing power. 17 Peck Slip, New York.

Acme Lathes.—Swing, 7 in.; turn, 19 in. long; back geared; screw cutting. Send 3 cent stamp for circular and price, to W. Donaldson, southwest corner Smith and Augusta, Cincinnati, Ohio.

Shaw's Mercury Gauges, 5 to 50,000 lbs.; accurate, reliable, and durable. T. Shaw, 915 Ridge Ave., Phila., Pa.

The Twiss Automatic Engine; Also Vertical and Yacht Engines. N. W. Twiss, New Haven, Conn.

Wanted—An energetic party with capital, to publish and introduce a small book (copyrighted), which will sell in every town in the country. Address, with reference, J. W. S., Lock Box 1973, Phila., Pa., P. O.

New Pamphlet of "Burnham's Standard Turbine Wheel" sent free by N. F. Burnham, York, Pa.

17 and 20 in. Gibed Rest Screw Lathes. Geo. S. Lincoln & Co., Hartford, Conn.

Sheet Metal Presses, Ferracute Co., Bridgeton, N. J.

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

Eagle Anvils, 9 cents per pound. Fully warranted. Clipper Injector. J. D. Lynde, Philadelphia, Pa.

A Cupola works best with forced blast from a Baker Blower. Wilbraham Bros., 2318 Frankford Ave., Phila.

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

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works, Drinker St., Philadelphia, Pa.

The Ornamental Penman's, Engraver's, Sign Writer's, and Stonecutter's Pocketbook of Alphabets; 32 plates; 20 cts; mail free. E. & F. N. Spon, 446 Broome St., N. Y.

Linen Hose.—Sizes: 1 1/2 in., 20c.; 2 in., 25c.; 2 1/2 in., 30c. per foot, subject to large discount. For price lists of all sizes, also rubber lined linen hose, address Eureka Fire Hose Company, No. 13 Barclay St., New York.

Dead Stroke Power Hammers; cheapest and best for general forging and die work; 500 in use. P. S. Justice, of Philadelphia.

Forsyth & Co., Manchester, N. H., and 213 Centre St., New York. Specialties.—Bolt Forging Machines, Power Hammers, Combined Hand Fire Engines and Hose Carriages, new and 2nd hand machinery. Send stamp for illustrated catalogues, stating just what you want.

Partner Wanted.—A party with limited capital.—Address Des Moines Linseed Oil Works, Des Moines, Iowa. American Watch Tool Co., Waltham, Mass. Lathes for Optical Instrument Makers.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

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

Needle Pointed Iron, Brass, and Steel Wire for all purposes. W. Crabb, Newark, N. J.

The Lathes, Planers, Drills, and other Tools, new and second-hand, of the Wood & Light Machine Company, Worcester, are being sold out very low by the George Place Machinery Agency, 121 Chambers St., New York.

Twenty-five per cent saved by use of H. W. Johns' Asbestos Palm. 87 Maiden Lane, New York.

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

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.

Portland Cement—Roman & Keene's, for walks, cisterns, foundations, stables, cellars, bridges, reservoirs, breweries, etc. Remit 25 cents postage stamps for Practical Treatise on Cements. S. L. Merchant & Co., 53 Broadway, New York.

For Sale.—7 foot bed Putnam Planer, \$350. A. A. Pool & Co., Newark, N. J.

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.

C. M. Flint, Fitchburg, Mass., Mfr. of Saw Mills and Dogs, Shingle and Clapboard Machines. Circulars.

The best Friction Clutch Pulley and Friction Hoisting Machinery in the world, to be seen with power applied, 85 and 97 Liberty St., New York. D. Frisbie & Co., New Haven, Conn.

Wanted—A Machine for Cutting a Hide into a Continuous Strip preparatory to running it through the tubes for sewing machine belts. Address Edmund Hill, 531 Jefferson St., Philadelphia, Pa.

The 1879 Pennsylvania Lawn Mower.—Light draught and easily adjusted. Machines warranted. See illustrated editorial, Sci. Am., No. 14. Lloyd, Supplee & Walton, Philadelphia, Pa.

Renshaw's Ratchet (short spindle) uses taper and square shank drills. Pratt & Whitney Co., Hartford, Ct.

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Pittsburgh Steel Casting Company, Pittsburgh, Pa.

Wood-working Machinery, Waymouth Lathes. Specialty, Warwell Patent Saw Bench; it has no equal. Improved Patent Planers; Elevators; Dowel Machines. Rollstone Machine Company, Fitchburg, Mass.

The new "Otto" Silent Gas Engine is simple in construction, easy of management, and the cheapest motor known for intermittent work. Schleicher, Schumm & Co., Philadelphia, Pa.

Dead Pulleys that stop the running of loose pulleys and their belts, controlled from any point. Send for catalogue. Taper Sleeve Pulley Works, Erie, Pa.

Pulverizing Mills for all hard substances and grinding purposes. Walker Bros. & Co., 234 and Wood St., Phila., Pa.

The new fragrant Vanity Fair Cigarettes. New combinations of rare Old Perique and Virginia.

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.



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

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 do not appear after a reasonable time should repeat them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) G. E. M. asks: Can you tell me how the fine lines of a micrometer, used in measuring microscopical objects, are ruled? A. By means of a very accurate and expensive machine called a dividing engine.

(2) P. J. W. asks: 1. What size battery will produce an electro-magnet of 50 lbs. lifting power? A. Use four or six cells of Bunsen. 2. Is there any means of estimating the attractive power of an electro-magnet at any given distance from its poles, the power at the pole being known? A. Magnetic attractions and repulsions are inversely as the squares of the distances.

(3) W. A. B. asks: 1. How can I procure the powered silver you mention in your issue of March 22, used in the Right telephone? Will very fine silver filings do? A. We do not know that it is in the market; you can make it by grinding silver leaf with honey on a marble slab, afterward carefully removing the honey by repeated washings. 2. Are the wires connected the same in this telephone as in the carbon telephone? A. One wire is connected with the spring; the other to the metal plunger attached to the diaphragm.

(4) L. O. B. asks: 1. Does it make any difference which binding post of a Bell telephone is connected to the zinc pole of a battery? If it does how must it be connected? I want to experiment with a microphone. A. No. 2. Will one cell of a Watson battery be sufficient to operate a call bell, on a line 1 mile long? A. No; use four.

(5) G. R. D. asks: 1. What kind of paper is used to produce the stencil with the mechanical pen? A. Any thin paper, of smooth, firm texture. 2. How are copies taken after the stencil is made? A. By stretching the stencil in a frame, placing it in contact with the paper to receive the copy, and passing over it a roller charged with stencil ink.

(6) A. B. & B. ask: 1. How big a wire rope will it require, stretched over a span of forty feet, to sustain a load of one ton or 2,000 lbs? A. 7/8 to 1 inch diameter. 2. How much will such a rope deflect in center, when stretched moderately tight, and what means are employed to get such a rope stretched tight enough? A. 3/4 feet. Consult Stahl's "Power by Wire Ropes."

(7) A. B. P. asks: 1. In making small magnets must I use fine or coarse wire? Tell why telegraph sounders are made with very fine wire, and magnets made to break the currents in shocking machines are coarse. A. The size of wire required for a magnet will depend altogether on the purpose for which the magnet is intended. The resistance of the wire is proportional to its size. If the magnet is used on a line of small resistance, the wire may be larger than when the resistance is great. Consult a good work on electricity. 2. How to make carbon for batteries. A. See SCIENTIFIC AMERICAN SUPPLEMENTS, Nos. 157, 158, and 159.

(8) P. J. asks: 1. In constructing an induction coil would hard wood or bone answer instead of vulcanite for the cylinder for commutator? Also for the tray in the "Simple Electric Light," described in SUPPLEMENT No. 182? A. Yes, in either case; but it should be filled with paraffine. 2. Will silver answer in place of platinum for point of screw and contact piece on the spring of the vibrating armature? If not, why? A. No; it will burn out too easily. 3. What is "tea paper," and where can I get it? A. The thin white paper used by grocers.

(9) S. W. writes: I am trying to plate steel knives and forks with tin. Please tell me what will cause the tin to flow smooth and appear white when finished. A. Clean the metal by scouring with moist pumice stone powder, and rinse in clean hot water, which will cause it to dry quickly. Then dip it in the melted tin covered with rosin, removing it frequently to rub with a brush of clean hemp. Then transfer for a short time to a pot of very hot tallow, free from salt, on removal from which tap smartly to remove list; cool, and clean with sawdust.

(10) D. B. B.—Please give a recipe for acid bath and process for sharpening old files in such a bath. A. The files must be thoroughly cleansed in warm water containing a small quantity of potash, which readily removes all the grease and dirt. After they are thus cleansed they must be washed with warm water and dried by artificial heat. Next place 1 pint of warm water in a wooden vessel and put in as many files as the water will cover, then add 2 oz. blue vitriol (sulphate of copper), finely pulverized, and 2 oz. borax, well mixed, taking care to turn the files over so that each may come in contact with the mixture. To the above mixture now add 7 oz. sulphuric acid and 1/4 oz. cider vinegar, which will cause the files to assume a red appearance at first, but they will in a short time resume their natural color. Then remove them, wash in cold water, and dry by artificial heat. When dry, sponge with olive oil, wrap in porous paper, and lay aside for use.

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

C. M. M.—It is chiefly composed of iron pyrites (fool's gold)—of no value.—S. P.—The bead contains iron and copper—no silver.—H. B. It is an impure potter's clay. Properly washed it might be worth about a dollar per ton at the pottery.—E. F. A.—It is clay slate. It does not contain an appreciable quantity of gold or silver.—W. R. C.—It is a brown hematite (iron ore) of some value.

COMMUNICATIONS RECEIVED.

On Pigeon House. By H. R. On Squaring the Circle. By R. R. P. On Squaring the Circle. By C. M. G. On Ice Caves. By A. L. R. On Life and Electricity. By T. B. M. On Grain Binding Material. By N. C. T. On Sewer Gas. By D. W.

[OFFICIAL.]

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending April 1, 1879, 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.

Table listing inventions and their patent numbers, including items like Adjustable bracket, Advertiser, street lamp, Albumen for the production of moulded articles, etc.

Table listing inventions and their patent numbers, including items like Car coupling, Car starter, Car starter, S. Graham, Car street, W. P. Hansell, Carbureter, air and gas, Card clothing, Carriage door sash frame, Carriage top, F. A. Presko, Carriage, J. E. Tyler, Carriage loader, C. A. R. Dimon, Caster sewing machine, J. O. Sloan, Chain, log or bull, R. J. Millen, Cheese vats, milk agitator, M. P. Jackson, Chests, construction of, G. V. Luce, Cigar stand, J. Grzybowski, Cistern, drain, T. Houston, Clock pendulum clutch, E. Davies, Clothes line support, W. W. Glehill, Clothes pounder, C. F. K. Wilson, Cock, water and steam, W. H. Hoyt, Coin counter, H. Clark, Coin wrapper, G. Rettig, Column, F. H. Smith, Cooker and steamer, T. Lee, Corn dropper and marker, J. A. & J. J. Stephenson, Crane, mail bag, H. M. Hall, Cultivator fencer, A. & M. Simmons, Cultivator, wheel, A. Sanders, Curtain fixture, G. C. Mathers, Dam, D. Tufts, Dental engine, H. Laurence, Dental plate, W. D. Holbrook, Desk and work table, writing, E. Emanuel, Direct acting engine, W. F. Garrison, Discharge pipe plug, wash basin, etc., J. S. Gilbert, Dish heater and holder, S. R. Jarvis, Ditching machine, Grant & McClelland, Dyeing aniline black, H. Kinsbourg, Egg carrier, J. L. Stevens, Egg lifter, B. W. Nelson, Feed water heater, Goodwin & Joyce, Fence, J. R. Elliott, Fence, A. G. Powell, Fence, D. Wright, Fence, iron, I. L. Sherman, Fiber, animal, J. A. Southmayd, Fiber separator, J. A. Southmayd, File, letter, J. F. Tapley, Filter, J. Grant, Firearm, breech-loading, C. A. King, Firearm, magazine, A. Burgess, Fire kindler, J. McShane, Fireproof box for papers, etc., N. Fowler, Forging hammers, D. Mayole, Fur articles, S. D. Castle, Furs, treating, S. D. Castle, Furnace, E. W. & C. W. Blair, Gas burner, M. B. & C. G. Dyott, Gas lighter, electric, W. H. H. Whiting, Gas meter, wet, G. Lizars, Gas regulator, S. F. Teach, Glass furnace, D. Agnew, Gold beater, J. H. Cooper, Grain, apparatus for removing germs and fuzz from, Potts & Parson, Grain binder, F. W. Randall, Grain separator, W. S. Reeder, Grain separators, straw carrier for, W. S. Reeder, Grate bar, J. Ashcroft, Grave or tomb, J. H. Thorp, Grinding mill, millings, J. Mills, Guano and seed distributor, J. Scoggin, Gun, magazine, A. Burgess, Harness, gag runner for, W. M. Blain, Harvester grinder, R. P. Clarke, Hat, wire brim, L. T. Smith, Hay rake, horse, A. W. Mathis, Heating pot, H. J. Nelson, Heel shave, H. A. Lothrop, Heel trimmer, J. H. Busell, Horse binder, I. R. Armstrong, Horse power, P. K. Dederick, Horseshoe weight, J. Robinson, Hot air engine, H. W. Sherrill, Hot air furnace, W. J. Towne, Hydraulic engine, L. K. Fuller, Hydraulic engine, J. Talley, Infusions, making, R. U. Etzensberger, Inlaying metallic scroll ornaments in hard rubber and allied gums, M. Smith, Joint for solid and tubular connections, C. H. Jackson, Knit vest or jacket for female wear, J. Cave, Knitting machine, E. Tiffany, Ladders, portable platform for fire and other, M. Cronin, Lamp, C. F. Spencer, Lantern, railway signal, D. W. F. De Grange, Lasting machine, device for applying power from a rotating shaft to a, Woodward & Brock, Latch, closet, W. E. Sparks, Levees, protecting, J. Johnson, Liniment, S. C. Buchanan, Log roller, E. Tarrant, Loom temple, Porter & Clark, Lounge, folding, O. Stechhan, Machinery motor, J. Williams et al., Meat, preserving raw, A. A. Libby, Mechanical motor, A. G. Kiler, Metals, working cast malleable, E. Wheeler, Millstone pick, R. J. Wheatly, Millstones, ventilating, G. Helfert, Naphtha burner, U. P. Smith, Nozzle, noise-quieting steam, T. Shaw, Odor destroyer, B. J. Tayanman, Ore separating jigger, W. H. Plumb, Ores in their natural situation, process and apparatus for melting, C. M. T. Du Motay, Ore reducer, J. Seanor, Packing, piston, E. B. Colby, Packing spring, piston, J. Sadler, Padlock, W. C. McGill, Padlock, Wirth & Wichert, Paper bags, making, Nugent & Burns, Paper perforator, W. Koch, Pedal mechanism, W. R. McDonald, Peg rasper, W. B. Arnold, Pelts, finishing, S. D. Castle, Pencil, L. De Faber, Pianoforte action, G. O. V. Roedern, Pitman connection, A. D. Love, Planters, check rower for corn, L. B. Berrien, Plow, C. V. Dyer, Plow gang, L. M. Kelly, Printing press perforator, J. A. Carruth, Printing press sheet deliverer, S. D. Tucker, Pump, double-acting, W. Rodda, Pump, force, W. H. Kaey, Pump, hydraulic, W. Foster