

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.

TO THE CONSTANT CURRENT CURE COMPANY, 207 Main St., Buffalo, N. Y.

SIRS: Your Constant Current Electric Generator, which I have used for several weeks, has entirely cured me of rheumatism, and has proved extremely beneficial in other ways. With it I have counteracted the debilitating effects of overwork and warm weather, and have been invigorated and imbued with fresh vitality. Three of my friends, to whom I loaned my generator, have each ordered one from you. W. R. WARREN, 45, 47, and 49 William St., N. Y.

For Sale.—A complete set of Patterns, Flasks, and Core Arbors for making Cast Iron Flanged Pipe, Elbows, Tees, and Greenhouse Fittings. Will be sold low to clean out a branch of a business. Address B, Box 233, New York.

For Sale.—9 in. x 9 in. Propeller Engine and Boiler, Shaft, Wheel, Pipes, etc. W. J. Sanderson, Syracuse, N. Y. Cheap engines, Boilers, Pipe, etc., for sale. See adv. of Logan Machine Works on page 263 this issue.

A pair of 15 x 24 Engines, good as new, for sale cheap, as they must be removed. J. C. Todd, 10 Barclay St., N. Y.

Pays well on small investment. — Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusement. 116 page illustrated catalogue free. McAlister, Manufacturing Optician, 49 Nassau St., N. Y.

Superintendent wanted.—A man competent to superintend a works employing about 300 hands in building machinery and tools, and in manufacturing goods for a regular trade. None but a first-class man in all respects need apply. Address B, Box 233, New York.

Constant Current Electric Generator. Price, \$3. Constant Current Cure Company, 207 Main St., Buffalo, N. Y. Send for circular. See advertisement, p. 253.

Clark & Heald Machine Co. See adv., p. 206.

Ajax Metals for Locomotive Boxes, Journal Bearings, etc. Sold in ingots or castings. See adv., p. 236.

New Combined Milling and Gear Cutting Machines, large range. C. A. Condit & Co., Makers, Philadelphia, Pa.

A valuable article on the Treatment of Acute Rheumatism, by Alfred Stillé, M.D., will be found in SCIENTIFIC AMERICAN SUPPLEMENT, No. 289. Anything from the pen of this eminent and experienced physician is interesting and instructive.

New Method of Graining, etc. J. J. Callow, Cleveland, O. Foot Lathes, Fret Saws, &c. 90 pp. E. Brown, Lowell, Mass.

"How to Keep Boilers Clean," and other valuable information for steam users and engineers. Book of sixty-four pages, published by Jas. F. Hotchkiss, 24 John St., New York, mailed free to any address.

Alden Crushers, Westinghouse Mach. Co., Pittsburg, Pa.

Supplement Catalogue.—Persons in pursuit of information on any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. THE SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York. Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties.

Cope & Maxwell Mfg. Co.'s Pump adv., page 234.

Punching Presses & Shears for Metal-workers, Power Drill Presses \$25 upward. Power & Foot Lathes. Low Prices. Peerless Lunch & Shear Co., 115 S. Liberty St., N. Y.

Pure Oak Leather Belting. C. W. Army & Son, Manufacturers Philadelphia. Correspondence solicited.

Presses & Dies, Ferracute Mach. Co., Bridgeton, N. J.

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

Wood Working Machinery of Improved Design and Workmanship. Corlesman, Egan & Co., Cincinnati, O. Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro. 294 Broadway, New York.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

National Steel Tube Cleaner for boiler tubes. Adjustable durable. Chalmers-Pence Co., 10 Cortlandt St., N. Y.

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, & Son Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting. Wm. F. Forrepaugh, Jr. & Bros., 531 Jefferson St., Philadelphia, Pa.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, etc. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y.

C. B. Rogers & Co., Norwich, Conn. Wood Working Machinery of every kind. See adv., page 206.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's adv., p. 221. Safety Boilers. See Harrison Boiler Works adv., p. 222.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 221.

Rollstone Mac. Co.'s Wood Working Mach'y adv., p. 233. The Sweetland Chuck. See illus. adv., p. 233.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Skinner's Chuck, Universal, and Eccentric. See p. 236. For Machinists' Tools, see Whitcomb's adv., p. 238.

The American Electric Co. and Proprietors and Manufacturers of the Thomson Houston System of Electric Lighting of the Arc Style. New Britain, Conn. See Bentel, Margedant & Co.'s adv., page 254

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

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. DuBois, 24 Columbia St., New York.

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

Telegraph, Telephone, Elec. Light Supplies. See p. 253. Elevators, Freight and Passenger, Shafting, Pulleys and Hangers. L. S. Graves & Son, Rochester, N. Y.

Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa. Gould & Eberhardt's Machinists' Tools. See adv., p. 222.

The Medart Pat. Wrought Rim Pulley. See adv., p. 253.

For Heavy Punches, etc., see illustrated advertisement of Hilles & Jones, on page 254.

Centrifugal Pumps, 100 to 35,000 gals. per min. See p. 253.

Barrel, Key, Hoghead, Stave Mach'y. See adv. p. 254.

Draughtsman's Sensitive Paper. T. H. McCollin, Phila., Pa.

Lathes, Planers, Drills, with modern improvements. The Pratt & Whitney Co., Hartford, Conn.

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

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, Send for catalogue to Rowley & Herance, Williamsport, Pa.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher-Schumm & Co., Philadelphia, Pa. Send for circular.

Electric Lights.—Thomson Houston System of the Arc type. Estimates given and contracts made. 631 Arch, Phil. Common Sense Dry Kiln. A adapted to drying all of material where kiln, etc., drying houses are used. See p. 254. 4 to 40 H. P. Steam Engines. See adv. p. 254.

The Porter-Allen High Speed Steam Engine. Southwork Foundry & Mach. Co., 430 Washington Av., Phil. Pa.



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. If not then published, they may conclude that, for good reasons, the Editor declines 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 give me a recipe for making black ink that will flow freely, be durable, and brilliant jet black at time of writing? There are plenty of inks that turn black. I want an ink that writes black and stays black. A. Try the following: add to a pint good iron gall ink from ten to fifteen drops of nitric acid, and heat over the water bath until reduced about one-fifth in volume, then add six drachms of pyrogallic acid and half an ounce of neutralized indigo-sulphate (paste). See other receipts for black inks in SUPPLEMENT, No. 157.

(2) A. W. asks: What are the expansive properties of air compared with steam? Suppose a vessel filled with air, say at 30 lb. pressure, we reduce the space occupied by the air to one-half, would the pressure be just doubled, or what would the pressure then be per square inch? A. Air follows the same law as steam. Reducing the volume one-half doubles the pressure within a small fraction, if the temperature remains unchanged. 2. How are air guns made? A. You will find a description of air guns in "Appletons' Dictionary of Machines, etc.," also in "Appletons' Dictionary of Applied Mechanics."

(3) O. R. M. asks: What kind of paper is used in making paper canoes, and how is it cemented together? A. Sheets of stout manila passed through a hot bath of aqueous solution of zinc chloride (at 75° B.), pressed strongly together and then soaked in dilute aqueous soda solution containing a small amount of glycerin, cohere to form a strong, stiff, waterproof board admirably adapted to the construction of small boats. Single sheets of paper passed quickly through the zinc chloride bath, pressed and washed and dried, are waterproof, and may be otherwise joined to form waterproof boards by any suitable cement.

(4) J. M. B. asks: How can I make indelible ink of good quality for marking on linen? (A) Add caustic alkali to a saturated aqueous solution of cuprous chloride until no further precipitate forms; allow the precipitate to settle, draw off the supernatant liquid with a siphon, and dissolve the hydrated copper oxide in the smallest possible quantity of ammonia. It may be mixed with about six per cent of gum dextrine for use. Before washing pass a hot iron over the writing. (2) Asphaltum, 1 part; oil of turpentine, 4 parts; dissolve and temper with printer's ink. Best used with a stamp. See other recipes on this page.

(5) G. A. H. inquires how to make a durable whitewash for outbuildings. A. Slake half a bushel good lime in boiling water in a covered vessel, and strain it through a fine sieve; add a peck of salt dissolved in a small quantity of hot water, three pounds of rice boiled with water to a thin paste, one pound of Spanish whiting, one pound of glue softened by soaking in water and then dissolved over a water bath, and five gallons of hot water. Agitate, cover from dust, and allow to stand several days. Apply hot. Slaked lime or hydraulic cement mixed with skimmed milk makes a cheap and durable paint for outdoor work.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending September 20, 1881. AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

A printed copy of the specification and drawing of any patent in the annexed list, also of any patent issued since 1866, will be furnished from this office for 25 cents. In ordering please state the number and date of the patent desired and remit to Munn & Co., 37 Park Row, New York city. We also furnish copies of patents granted prior to 1866; but at increased cost, as the specifications not being printed, must be copied by hand.

Table listing inventions with patent numbers and dates. Includes items like Addressing machine, Air cooling apparatus, Amalgamator, Animal trap, Arbors for pinions, Ashes garbage, etc., receptacle, Axle box, Axle lubricator, Axle, vehicle, J. Howell, Bag fastener, Bag holder, Bag holder, Baking powder safe and mixer, Bale tie, Baling press, Bar, Barley fork, Bearing, adjustable, Bed, invalid, Bed lounge, Beehive, Belt, electric, Belt guide, automatic, Board, Boiler furnace, Book clasp, Boot and shoe buffing machine, Boot straps, device for fastening on, Bottle stopper, medicine, Bottling machine, Box, See Axle box, Cuff box, Paper packing box, Dredge box, Toy box, Boxes, manufacture of, Bracelet, W. Byron, Brake, See Car brake, Brewing, M. Mueller, Brewing, clarifying apparatus for, Welz & Rittner, Brick for gas retorts, J. Flannery, Brick, making lime, J. Reese, Brush, G. Gruber, Buckle and strap fastener, J. Hudson, Burglar alarm, H. A. Holloman, Burglar alarm, electric, H. C. Roome, Burglar alarm, electrical, H. C. Roome, Burner, See Lamp burner, Vapor burner, Button, Bramer & Little, Car brake, B. F. Stewart, Car brake, Widdifield & Button, Car, cattle, F. B. Sheble, Car coupling, G. Butler (r), Car coupling, J. Geery, Car coupling, I. W. Keithley, Car draw bar, railway, J. Neill, Car, railway, T. Luce, Carbureter, N. D. Morey, Carpet sweeper, C. M. Clark, Carriage body, H. W. Titus, Carriage, child's, E. W. Burton, Carriage, child's, A. Shoeninger, Carriage, child's, O. Unzicker, Carriage top, T. S. Burnett, Carriage wheel, W. T. Dole, Carriage shells, arranging, G. L. Sanford, Cartridge wafer, F. G. Farnham, Centrifugal machines, construction of, E. Langen, Chair, See Railway chair, Cigar receptacle for attachment to billiard and other tables, E. A. Rice, Clamp, See Screw clamp, Clasp, See Book clasp, Claw bar, A. A. Strom, Closet, See Water closet, Clothes pounder, Myers & Smith, Clothes rack, W. J. McCullen, Clutch mechanism, H. Coker, Coffee hulling and polishing machine, C. E. Whitman, Commode, Ellis & Laughlin, Cooler, See Milk cooler, Corn in the manufacture of starch, glucose, and other products therefrom, treating, A. Behr, Corn in the manufacture of starch, glucose, and other products therefrom, apparatus for treating, A. Behr, Corn sheller, J. S. Crowell, Corn sheller, L. Gillet, Cotton press, P. J. Mealen, Coupling, See Car coupling, Shaft coupling, Thill coupling, Cradle, A. H. Oradway, Crushing and pulverizing mill for coal, etc., J. G. McAuley, Cuff box, I. P. Turner, Cut-off valve gear, R. Hardie, Cutter, See Fell cutter, Straw cutter, Lace cutter, Thrashing machine band cutter, Dip pipe, G. A. McIlhenny, Drain pipe connection and plug for baths, etc., W. Ricketts, Dredge box, L. V. Husk, Drier, See Fruit drier, Drill planter and guano distributor, combined, W. M. Watkins, Easel, wire, A. M. Ernsberger, Electric cable, P. B. Delany, Electric machine, dynamo, C. J. Van De Poole, Electrical conductors, subterranean conduit for, S. D. Strohm, Elevator, See Pneumatic elevator, Tobacco elevator, Engine, See Paper pulp engine, Excavator and embanking machine, J. G. Dawes, Extractor, See Stamp extractor, Fanning mill, J. W. Johnson, Faucet, J. M. Peck, Feed rack, T. Hendrick, Feeding apparatus, calf, M. G. Marsillot, Fell cutter and trimmer, D. H. Coles, Fellies, method of and machine for boring, J. R. Locke, Fence, portable, J. W. Veley, Fence post, S. Heaton, File, bil. F. H. Cutler, File, check, H. V. Sanford, Filtration, G. F. Meyer, Fire alarm, automatic, J. H. Wood, Firearm, breech-loading, W. Mason, Firearm, magazine, E. Whitney, Firearm, revolving, W. Mason, Firearm, revolving, D. Smith, Firearms, trigger for double-barreled, W. Mason, Fish trap, A. Duval, Fork, See Barley fork, Frame, See Net frame, Fruit barrel or crate, C. E. Bartram, Fruit drier, D. Britton, Fruit drier, C. B. Burnash, Furnace, See Boiler furnace, Ore furnace, Heating furnace, Furnace feeding device, R. W. Drew, Furnaces, feeding fuel to puddling and other, C. Gearing, Gas heater, N. E. Chase, Gas retort, F. Egner, Gem settings, tool for making, C. I. Loveren, Governor, engine, W. Sneadson, Governor, steam engine, L. W. Andrews, Grain drier, steam, H. Cutler, Grain header, C. Theander, Grain separator, J. Root, Grate, fire, R. G. Christ, Grate raker, E. D. Merrick, Grates, fire back for mantel, Tressler & Loomis, Gun stock, H. W. White, Guns, cartridge feeder for machine, L. F. Bruce, Hame staple and tug clip, A. Kearful, Handle, See Wood working tool handle, Hanger, See Pipe supporting hanger, Harness, G. W. Blake, Harvesting machine, D. W. Entrikin, Hay and grain unloader, A. G. Crow, Hay rake and press, J. H. McConnell, Head rest, H. Y. Miller, Heat, warmth reservoir for emitting, A. Nieske, Heater, See Gas heater, Heating apparatus, gas, C. M. Lungren, Heating furnace, G. R. Brown, Hoe, F. J. Fischer, Holder, See Bag holder, Sash holder, Match waste holder, Thimble holder, Holophote for lighting dwellings, W. Wheeler, Hoop pointing machine, C. M. Clancy, Horse power, J. T. Howe, Horseshoe, Schlossstein & Warringer, Hydraulic press, J. H. McGowan, Indicator, See Low water indicator, Injector, feed water, J. Loftus, Knitting machine, W. Esty, Lace cutter, H. L. Chapman, Ladder, E. Row, Lamp, G. Chappel, Lamp burner and wick therefor, W. Painter, Lamp, electric, T. L. Dennis, Lamp, electric, H. S. Maxim, Lamp, electric, W. L. Voelker, Lamp, railway signal, C. H. Dascomb, Lantern astral, F. H. Bailey, Lathing and furring, metal, D. W. Lloyd, Leathering chamfering machine, Gurney & Piper, Letters for signs, raised, W. Kraus, Lighting dwellings and other structures, apparatus for, W. Wheeler, Lighting dwellings or other structures, apparatus for, W. Wheeler, Lock, See Nut lock, Locomotive, R. Hardie, Low water indicator for steam boilers, V. Trainor, Lubricator, See Axle lubricator, Lubricator, J. V. J. Renchard (r), Man hole and hand hole stopper, D. Sullivan, Mangle, W. Lewis, Mutch waste holder, J. P. Edwards, Middlings purifiers, roller mills, etc., automatic feeder for, C. E. Sage, Milk cooler, C. C. Haynes, Mill, See Crushing and pulverizing mill, Fanning mill, Ore crushing mill, Roller mill, Windmill, Moistening jet for factories, J. Beggs, Monkey wrench, G. T. Pinagin, Mortising doors for locks, machine for, T. N. Andrews, Necktie shield, W. W. Fichtenberg, Net frame, mosquito, A. M. Douglas, Nut lock, H. C. Behr, Oranges and other fruit, apparatus for sizing, H. B. Stevens, Ore crushing mill, H. M. Cornell, Ore furnace, O. Hofmann, Ore separating jig, A. F. Wendt, Oven, J. H. Irwin, Oyster opener, A. Ward, Paper cutting machine, E. Partington, Paper drying apparatus, H. F. Case, Paper, manufacture of embossed lace, C. Lang, Paper packing box, F. M. Leek, Paper pulp engine, J. R. Abbe, Pavement, concrete, J. J. Schillinger, Permutation locks, angle bar for, J. L. Hall, Pianoforte action, Hebard & Given, Piano tuning pin, F. E. King, Pillow sham, C. L. Work, Pin, See Piano tuning pin, Pins, safety catch for, G. W. Washburn, Pipe, See Dip pipe, Pipe supporting hanger, W. Kane, Planter, cotton seed, C. Marsh, Platform spring, S. W. Cately, Plow point, C. Anderson, Plow point, R. C. Tucker, Plows, sulky carriage for, Ward & Washburn, Pneumatic elevator and grain separator, combined, L. O. Stevens, Pocketbooks, etc., fastener for, L. Strauss, Post, See Fence post, Power, See Horse power, Press, See Mangle press, Cotton press, Hydrostatic press, Punching press, Printers' galleys, foot lock for, W. J. Adams, Printing and other surfaces, producing, J. J. Sachs, Printing machine, R. J. Johnston, Printing presses, paper folding attachment for, T. C. Dexter, Propellers, elevating and depressing, R. L. Stevens, Pump, P. E. Jay, Pump, J. A. Pease, Pump, vacuum, F. Winhausen,