

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.

Portable Railroad Sugar Mills, Engines and Boilers. Atlantic Steam Engine Works, Brooklyn, N. Y.

Brass or Iron Gears; Models. G. B. Grant, Boston.

Self-Balanced Slide Valve. Wanted, a party to build and introduce engines with self-balanced valve. Monopoly to party. For particulars, address K. G. Bishop, Chetopa, Kan.

Draw'g Insts. & Mat. Woolman, 116 Fulton St., N. Y.

Wanted—to correspond with parties who will make and sell new Steam Engine Governor on royalty. Address S. Whitney, Wheeler, Ala.

The Best Invention for Butter Shippers. "Byram's Patent Refrigerating Butter Carrier." Send for circular. S. D. Byram, Liberty, Ind.

For Sale.—48 in. x 12 ft. Planer, in good order, price \$700. E. P. Bullard, 14 Dey St., New York.

Gear Cutlery Attachment for Lathes, Fine Tools, Lace Leather Cutter, Belting, etc. Jackson & Tyler, Baltimore.

The greatest success ever attained in the production of materials for structural purposes has been achieved by the H. W. Johns Manufacturing Co., 87 Maiden Lane, New York, in the production of their Asbestos Liquid Paints, which are not only in use upon the finest and largest structures in this country, among others the Metropolitan Elevated Railroad, the U. S. Capitol at Washington, etc., but are also rapidly taking the place of all others for dwellings, on account of their superior durability and beauty, which render them the best and most economical paints in use.

Wanted for cash.—A 2d hand Engine Lathe, 36 in. swing, to turn 16 ft. Moltz & Bro., Williamsport, Pa.

Wanted—The Agency for a good Washing Machine; also other patented articles. Address Bragdon Bros., 16 Federal St., Allegheny, Pa.

For Sale.—Sole right, patterns, engravings, and tools, all sizes, ready to manuf. Steam Heating Apparatus. Send for illustrations. Kafer & De Lacy, Trenton, N. J.

For Sale Cheap.—Two Amateur Sham Engines. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.

Patent For Sale.—Solid Die Rivet Making Machine. G. A. Gray, Johnston Building, Cincinnati, O.

Experimental Machinery and Patent Office Models. Cheap at W. Gardam & Son, 112 John St., New York.

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

Seam Excavators. J. Souther & Co., 12 P. O. Sq. Boston.

All makes and sizes of Steam Hammers bored out. L. B. Flanders Machine Works, Philadelphia, Pa.

The Secret Key to Health.—The Science of Life, or Self-Preservation, 300 pages. Price, only \$1. Contains fifty valuable prescriptions, either one of which is worth more than ten times the price of the book. Illustrated sample sent on receipt of 6 cents for postage. Address Dr. W. H. Parker, 4 Bulfinch St., Boston, Mass.

The Baker Blower runs the largest sand blast in the world. Wilbraham Bros., 2313 Frankford Ave., Phila., Pa.

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

Forsyth & Co., Manchester, N. H., & 213 Center St., N. Y. Bolt Forging Machines, Power Hammers, Comb'd Hand Fire Eng. & Hose Carriages, New & 2d hand Machinery. Send stamp for illus. cat. State just what you want.

Wright's Patent Steam Engine, with automatic cut-off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

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

H. Prentiss & Co., 14 Dey St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn.

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

Linen Hose.—Sizes: 1 1/2 in., 20c.; 2 in., 25c.; 2 1/2 in., 29c. 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.

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

Eclipse Portable Engine. See illustrated adv., p. 189.

Bradley's cushioned helve hammers. See illus. ad. p. 206.

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

Band Saws a specialty. F. H. Clement, Rochester, N. Y.

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

Yacht Engines. F. C. & A. E. Rowland, N. Haven, Ct.

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

Noise-quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

Stave, Barrel, Keg, and Hoghead Machinery a specialty, by E. & B. Holmes, Buffalo, 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.

New 3/4 foot Boring and Turning Mill for sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

A well equipped Machine Shop desire to manufacture special machinery. Address T. H. Muller, care of P. O. Box 532, New York.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. of Porter Mfg. Co., page 206.

Walrus Leather and Bull Neck for Polishing all Metals. Greene, Tweed & Co., 18 Park Place, New York.

Oak Tanned Leather Belting, Rubber Belting, Cotton Belting, Polishing Belts. Greene Tweed & Co., N. York. Pays well on small investments; Magic Lanterns and Stereopticons of all kinds and prices; views illustrating every subject for public exhibition and parlor entertainments. Send stamp for 80 page Illustrated Catalogue. Centennial medal. McAllister, 49 Nassau St., New York.

Cooper Manufacturing Company, Mt. Vernon, Ohio, Manuf's of Stationary, Portable, and Traction Engines, Saw Mills, Grist Mills, Mill Machinery, etc. Engineers and Contractors. Circular free.

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

Elevators, Freight and Passenger, Shafting, Pulleys, and Hangers. L. S. Graves & Son, Rochester, N. Y.

Cut Gears for Models, etc. (list free). Models, working machinery, experimental work, tools, etc., to order. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.

Holly System of Water Supply and Fire Protection for Cities and Villages. See advertisement in SCIENTIFIC AMERICAN of this week.

Self-feeding Upright Hand Drilling Machines of superior construction. Pratt & Whitney Co., Hartford, Ct.

Deoxidized Bronze. Patent for machine and engine journals. Philadelphia Smelting Co., Phila., Pa.

Improved Steel Castings; stiff and durable; as soft and easily worked as wroughtiron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburg Steel Casting Company, Pittsburg, Pa.

Steam and Gas Fitters' Tools a specialty. Send for circulars. D. Saunders' Sons, Yonkers, N. Y.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever.

For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

NEW BOOKS AND PUBLICATIONS.

ON THE USE OF THE BAROMETER ON SURVEYS AND RECONNOISSANCES. By Lieut. Col. R. S. Williamson. Washington: Government Printing Office.

A compendium (without plates) of Lieut. Col. Williamson's paper on the barometer, professional papers of the Corps of Engineers, No. 15, which puts this useful manual in a form convenient for field use.

A PRACTICAL TREATISE ON LIGHTNING CONDUCTORS. By H. W. Spang. Philadelphia. 12mo, paper, pp. 44.

Advocates Mr. Spang's system of non-insulated lightning conductors, instead of the ordinary insulated lightning rods.

THE ILLUSTRATED SYDNEY NEWS.

The Illustrated Sydney News has sent out a special invitation issue, designed to attract visitors to the International Exhibition at Sydney. It is an exceedingly creditable bit of enterprise, the numerous and excellent illustrations making a particularly good impression. There are given besides a four column leader on the Exhibition, descriptions of the buildings and grounds, and a large amount of information as to the climate, geography, population, and products of the colony.

SPONS' ENCYCLOPEDIA OF THE INDUSTRIAL ARTS, MANUFACTURES, AND COMMERCIAL PRODUCTS. Edited by G. G. Andre. F. G. S. New York: E. & F. N. Spon, 30 parts, each 75 cents.

Parts 5 and 6 of this Encyclopedia complete the article on potash, and add soda, alloys, alum, alumina, arsenic, asbestos, asphalt, assaying, atomic weights, baryta, and beverages, the last including aerated waters and beer.



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) W. E. M. writes: I am proprietor of a meat market at this place, also a subscriber for your paper. Last night, when going in my cooler, I noticed that a quarter of beef killed the day before gave forth a phosphorescent light, also blood that had dropped to the floor when spread over quite a surface lit the room so that I could distinguish objects for five feet. Can you explain this phenomenon? A. Many organic as well as inorganic substances exhibit the phenomenon of phosphorescence under certain circumstances. The cause is not definitely understood. Consult Phipson's "Phosphorescence in Minerals, Plants, and Animals;" also Becquerel's "La Lumiere, ses Causes et ses Effets." See article on p. 199, Vol. 40, SCIENTIFIC AMERICAN.

(2) A. W. P. asks: 1. Is there an instrument or anything that a man can use to find gold or silver coin that has been hidden underground? If so, please inform me where one can be obtained. A. A pick and shovel answer a good purpose. 2. I have a small engine, cylinder 5x10, makes 200 revolutions per minute: how much lead must I give the cut off valve—it cuts off at full stroke? I use 60 lb. of steam and the engine will pound. The pump piston is made fast to cross head. A. You should give the cut off valve at least 1-16 inch lead, and you may increase it, provided it does not reopen before the main valve closes.

(3) E. R. asks: 1. How does a vacuum rate as an insulator of electricity? A. Electricity cannot pass through a perfect vacuum. 2. What is the best metal to use for 3/4 inch pipe to contain cold drinking water, as cheap as is consistent with regard to health? A. Iron. 3. Are the contributions that you weekly announce under head of "Communications Received" all printed in the AMERICAN, or are part printed in the SUPPLEMENT? A. Some are published in the SCIENTIFIC AMERICAN, some in the SUPPLEMENT, and some not at all.

(4) E. S. asks for the surest method of silver plating large quantities of steel knives. The silver peels. I have no trouble with other metals. My solution deposits beautifully, but in burnishing comes up very blue. What is the cause? A. Your trouble is doubtless due to imperfectly cleansing the work or putting it in the bath before closing the circuit. Clean with hot potash or soda, and with dilute sulphuric acid and pumice stone or fine clean sand if necessary. The whitening bath should not be too strong, and should be worked with an extra cell or two.

(5) E. S. N. asks whether the black oxide of manganese will answer to mix with copper and tin to make the manganese bronze, mention of which was made in a late number of the SCIENTIFIC AMERICAN. I find the metallic manganese is too expensive (costing some \$290 per lb.) I find manganese classed among the metals difficult to fuse. Will the oxide melt at the temperature of molten copper? A. Yes; reduce the oxide to an impalpable powder (120 mesh), mix it with an excess of powdered charcoal, and add the mixture gradually to the copper. Under these circumstances the latter will take up the small quantities of the manganese reduced by the carbon.

(6) E. A. E. asks: 1. In the freezing of 25 lb. of water at 60° Fah., how much heat must be given off? A. Sufficient to raise about 22 lb. of water from the freezing to the boiling point. 2. What quantity of crushed ice and salt, mixed in the proportion to produce the greatest cold, will, in passing to the fluid condition, absorb this quantity of heat? A. In practice from 50 to 70 lb. of a mixture of 2 parts ice and one of salt would ordinarily suffice to cool the water to the freezing point.

(7) B. A. asks: Which is strongest or preferable for general work, a pulley (from 18 to 60 or more inches diameter) with curved or straight arms, and why? A. Formerly pulleys were cast with curved arms, with the idea that they would produce less shrinkage strain, as upon cooling they would yield or spring to the pressure, but the art of proportioning and casting pulleys has been so improved that we think the curved have little or no advantage over the straight arms.

(8) E. F. M. would like to know (1) if ships of medium size are propelled with screw propellers of four blades. A. Yes, from 8 to 14 feet diameter. 2. What size and how long are the blades? A. The length of the blades is the radius of the propeller, less the radius of the hub. 3. What width? A. From 20 to 30 inches. 4. At what angle do they strike the water? A. Generally from 55 to 70 degrees. 5. How wide a space of water would be displaced if turned without any forward or backward movement of the vessel? A. They are assumed to displace a column equal to their own diameter.

(9) O. T. G. writes: 1. In steam engine with 7 inch cylinder, 10 inch stroke, what should be proper dimensions of area of induction ports in square inches? A. 5/8 inch x 4 1/2 inches. 2. Area of eduction ports in square inches? A. 1 inch x 4 1/2 inches. 3. Inside diameter of steam pipes? A. 2 1/2 inches diameter. 4. What number of revolutions should such engines make with 50 lb. pressure in cylinder. A. It depends upon the amount of work it has; the speed of an engine is generally determined by the character of the work or machinery to be driven. 5. Please give rules for calculating the above. A. The above will give about the usual proportions for engines of this class. There are no rules for proportions applicable to all kinds of engines.

(10) D. & C. ask: 1. Can you tell us of a better way to smooth spokes, as they come from the lathe, than the sand belt? A. No. 2. We have trouble in getting the ground glass to adhere to the ducking belts. If there is no better way than to use the belts, is there a better cement than common glue for fastening the glass or emery to the belts? A. Apply a rather thick coating of good tough glue to your belt; heat the sand to 200° and press the belt into it. This method allows the sand to become deeply embedded in the glue. 3. How can we season oak hubs without their cracking, and the quickest way? We want to season them in three months, if possible. A. They are sometimes seasoned quickly by steaming, but this method cannot be recommended. Dry the ends superficially, and apply a coat of raw linseed oil.

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

T. L. F. & Co.—No. 1. A compact limestone resembling that from the celebrated Solenhofen mines, used extensively for lithographic purposes. No. 2. Quartz. No. 3. Impure crystallized lime carbonate. No. 4. A variety of calcite. No. 5. A fine marble. No. 6. Semi-crystalline impure limestone.—C. A. B.—The clay will probably make excellent bricks, but contains too much iron oxide, lime carbonates, silica, etc., to be useful for pottery.—J. W. K.—It is a rich magnetite—magnetic oxide of iron. A valuable ore of iron if free from phosphorus.—S. B. M.—The sample of resinous substance appears to be of vegetable origin. A larger sample would be requisite to properly classify it.—E. C. W.—Galena—sulphide of lead. It probably carries traces of silver. To ascertain the value would require an assay.—A. L. F.—Flint containing crystals of feldspar. 2. Similar to No. 1. 3. Feldspar rock with crystals of hornblende. 4. Similar to No. 1. 5. Conglomerate.—T. B. M.—Feldspar, of little commercial value.

COMMUNICATIONS RECEIVED.

On the Aurora. By C. P. L. On the Amia Calva. By J. S. On the Columbus Clock. By N. C. R. Crank Motion. By W. A. D.

INDEX OF INVENTIONS FOR WHICH Letters Patent of the United States were Granted in the Week Ending September 2, 1879, AND EACH BEARING THAT DATE. [Those marked (r) are reissued patents.]

Table listing inventions and their patent numbers, including Alloy for jewelry, W. W. Hubbell; Alloy metal for metric silver coin and silver ware, W. W. Hubbell; Alumina, making sulphate of, F. Laur (r); Axle, carriage, H. Killam; Axles, device for cutting and screw threading, metallic wagon, C. S. Adams; Ball ears to sheet metal vessels, attaching, G. W. Knapp; Barrel trussing machine, M. L. Deering; Bed bottom, spring, J. I. Wheeler; Bed, cushion, and like stuffings and carpet linings, treating, W. M. Blakeman, Jr.; Bed stuffing composition, W. M. Blakeman, Jr.; Bedstead, adjustable cot, Howe & Perry; Bedstead, wardrobe, M. Dupre; Beehive, M. Wright; Bell, electric call, G. L. Anders; Billiard cue, A. Fitzgerald; Boiler furnace, J. C. McNeill; Bolting screen or sieve, Forney & Bange; Boot and shoe shank stiffener, G. L. Talbot; Boot and shoe uppers, lasting, G. W. Copeland; Bottle stopper, A. F. Parkhurst; Bretzel machine, C. H. Appel; Brick, E. L. Schieffelin; Bridge gate, draw, F. C. Beck; Bronzing machine, D. Heston; Brush fountain, M. J. Sunderland; Bung bushing, W. Johnson; Butter, tempering, Bacher & McKinnis; Butter tub, E. R. Jones; Butter worker and printer, W. Weaver; Button, sleeve, W. Bourke; Button, sleeve and collar, R. M. Tripp; Calculator, G. Fuller; Calendar, J. E. Heath; Cant hook, A. Sanford; Carcoupling, N. F. Brent; Car coupling, A. W. Cain; Car coupling, T. A. Palm; Car coupling buffer head, J. T. Wilson; Car, postal, C. R. Harrison; Car starter, Gibson & Sealey; Cars, continuous brake for railway, R. D. Sanders; Cars, manufacture of king bolt plates for railway, J. T. Wilson; Carbureter, W. M. Jackson; Carbureting machine, air, E. Savill; Carpet lining, H. A. Stearns; Cartridge, L. A. Merriam; Caster, I. Leonard; Caster, L. Morgan (r); Castings, device for cooling, H. Wiard et al.; Celluloid, drying, J. B. Edson; Celluloid lining for ice pitchers, M. C. Leferts; Celluloid tubes to taper or other forms, reducing, W. B. Carpenter; Chain, detachable link for drive, L. W. Stockwell; Chain, drive, L. W. Stockwell; Chain links, die for welding, J. F. Busey; Chain, ornamental, C. F. Heckmann; Check book, bank, H. H. Norrington; Chimney, fireproof, H. Schreier; Churn, Minot & Rhoades; Churn motor, E. C. Rice; Churn power mechanism, M. J. Barrow; Clamp, S. Konz; Clay dissolver and washer, J. S. Estlin; Clocks, back action for striking movements of, W. D. Davies; Cloth register, A. Harrison; Clothes frame, A. Moore; Coin holder and deliverer, J. W. Meaker; Coop and crate, chicken, G. J. Cook; Corn receiver, N. Edwards; Corn sheller, W. A. Stone; Cotton and hay press, G. Cooper; Cotton cleaner, M. S. Hasie; Cribbage board, C. W. Le Count; Cultivating machine, C. E. Sackett; Cultivator J. J. Deal; Cultivator, C. E. Sackett; Cultivator, I. Utter; Curtain fixture, C. A. Kellogg; Curtain fixture, A. F. Temple; Damper and case, stove pipe, A. C. Norcross; Dead centers, device for overcoming the, J. W. Mullins; Dental engine, E. T. Starr; Dental plugger, A. M. Denham; Dental use, ribbon gold spoon for, H. Morrison; Desk and sewing machine cabinet, combination writing, J. W. Hosford; Distance instruments, altitude attachment for, R. W. Burton; Draught equalizer, D. P. Hershberger; Drawer, B. A. Armstrong; Drill sharpener, T. J. Williamson; Drying apparatus, E. Henderson; Eave trough hanger, J. R. Baker; Egg package, folding, W. E. King; Electric light apparatus, C. F. Brush; Electric lighting device, C. F. Brush; Electric machine, dynamo, Houston & Thomson; Faucet, W. C. Coddington; Faucet, D. A. Dyer; Faucet and corkscrew, bottle, W. E. Lant; Faucet attachment, J. P. Gruber; Faucet holder, safety, H. Hunziker; Feathers, imitation, M. Grodzensky; Fence, barbed, J. & W. M. Brinkerhoff; Fence, barbed, H. R. Burroughs; Fence, farm, A. R. Sprout; Feeder, H. C. Kring; File, bill, J. Bell; Firearm chamber former, C. O. Wood; Fishing line reel, E. C. Vom Hofe; Fuel, liquid, Smith & Munsell; Furnace bridge wall, J. Mailer; Furnace grate, A. Desgouttes; Gas apparatus, T. G. Springer; Gas retorts, etc., furnace for, G. Liegel; Gate, A. H. Allison; Gate, W. E. Deu Pree; Gate, B. H. Hickok; Glass moulds, preparing, H. Feurhake.