

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 publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

Vertical & Yacht Engines. T. P. Pemberton, 276 Water St., N. Y.

Brick Presses for Fire and Red Brick manufactured at 309 S. Fifth St., Phila., Pa. S. P. Miller & Son.

The great advantage of the genuine Asbestos Coverings for Steam Pipes, Boilers, etc., over any other forms of non-conducting coverings, aside from their superior effectiveness, is that they are manufactured in convenient form ready for use, and can be easily applied without the aid of skilled labor. The H. W. Johns Mfg Co., 87 Maiden Lane, N. Y., are the sole manufacturers.

Having bought the Forsythe Scale Works here, we offer our present manufactory, with 25 H. P. engine and boiler, for sale. This property is well situated for manufacturing, only three blocks from depot. Will be sold low. Waukegan, Ill., is 35 miles north of Chicago. Full description sent on application. Powell & Douglas, M'rs Pumps and Windmills, Waukegan, Ill.

For Sale cheap.—Williams' Standard Switch Board and District Hook Bells for Telephone Exchange. Address Exchange, Burlington, Vermont.

Practical Founder or Machinist, with some capital, desirous of going West. Box S, Helena, Montana, T.

Wanted—A pair of Hoisting Engines, cylinders 6 x 9 or thereby; new or second-hand, in good condition. Carnegie & Co., Larimer, Pa.

For Sale.—A small Iron Planer. W. W. Oliver, Buffalo, N. Y.

Wanted—The address of 40,000 Sawyers and Lumbermen for a copy of Emerson's Hand Book of Saws. New edition 1880. Over 100 illustrations and pages of valuable information. Emerson, Smith & Co., Beaver Falls, Pa.

Spokes and Rims, white oak and hickory, best quality to any pattern, and Hammer Handles of best hickory. John Fitz, Martinsburg, West Va.

Patent for Walter's Method of Carpeting Stairs, illustrated in this number, for sale cheap.

Wanted—Scrap Iron, car lots. Box 502, Pittsburg, Pa. For the best Stave, Barrel, Keg, and Hoghead Machinery, address H. A. Crossley, Cleveland, Ohio.

For Iron Gas Pipe, see adv. on inside page.

Sidewheel Yacht Engines, boats drawing 6 to 10 in. water, in pairs. Ad. T. & K., Owego, Tioga Co., N. Y.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, corners, borders, etc., sent on receipt of \$2. Palm & Fechteler, 403 Broadway, New York city.

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

National Steel Tube Cleaner for boiler tubes. Adjustable, durable. Chalmers-Spence Co., 40 John St., N. Y.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 126.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Pottsville, Pa. See p. 125.

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

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

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, Pittsburg, Pa., for lithograph, etc.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y. Bradley's cushioned helve hammers. See illus. ad. p. 110.

Forsyth & Co., Manchester, N. H., & 213 Centre 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.

Electrical Indicators for giving signal notice of extremes of pressure or temperature. Costs only \$20. Attached to any instrument. T. Shaw, 915 Ridge Ave. Phila.

Instruction in Steam and Mechanical Engineering. A thorough practical education, and a desirable situation as soon as competent, can be obtained at the National Institute of Steam Engineering, Bridgeport, Conn. For particulars, send for pamphlet.

Hydraulic Jacks, Presses and Pumps. Polishing and Buffing Machinery. Patent Punches, Shears, etc. E. Lyon & Co., 470 Grand St., New York.

Steam Engine for sale very low. See advertisement on another page.

Portable Forges, \$12. Roberts, 107 Liberty St., N. Y. For Mill Mach'y & Mill Furnishing, see illus. ad. p. 141.

Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

Eclipse Portable Engine. See illustrated adv., p. 94. Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Large knife work a specialty. Also manufacturers of Solomon's Parallel Vise. Taylor, Stiles & Co., Riegelsville, N. J.

The Twiss Automatic Cut-off; also Vertical and Yacht Engines. N. W. Twiss, New Haven, Conn.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y.

New Inventions examined and tested. Designs and improvements. Reports for investors. Recipes and information on all industrial processes. Benjamin's Sci. Expert Office, 37 Park Row, New York.

Ice Machines selected. Information on all kinds. Benjamin's Sci. Expert Office, 37 Park Row, New York.

Chase's Pipe Cutting & Threading Machine. Send for circular. Chase Machine Co., 120 Front St., New York.

Diamond Planers. J. Dickinson, 64 Nassau St., N. Y. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Eagle Anvils, 9 cents per pound. Fully warranted. Cylinders, all sizes, bored out in present positions. L. B. Flanders Machine Works, Philadelphia, Pa.

For Wood-Working Machinery, see illus. adv. p. 156. Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus'd adv. p. 62.

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

The Horton Lathe Chucks; prices reduced 25 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn. \$275 Horizontal Engine, 20 H. P. See page 156.

Emery Wheels of all kinds, and Machines at reduced prices. Lehigh Valley Emery Wheel Co., Weissport, Pa.

Pat. Steam Hoisting Mach'y. See illus. adv., p. 158. Hydraulic Cylinders, Wheels, and Pinions, Machinery Castings; all kinds; strong and durable; and easily worked. Tensile strength not less than 65,000 lbs. to square in. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

Drop Hammers, Die Sinking Machines, Punching and Shearing Presses. Pratt & Whitney Co., Hartford, Ct.

Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery, send for catalogue to Rowley & Hermance, 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.

Elevators.—Stokes & Parrish, Phila., Pa. See p. 158. Improved Solid Emery Wheels and Machinery, Automatic Knife Grinders, Portable Chuck Jaws. Important, that users should have prices of these first class goods. Address Amer. Twist Drill Co., Woonsocket, R.I.

NEW BOOKS AND PUBLICATIONS.

THE AMERICAN ANTIQUARIAN. A Quarterly Journal devoted to Early American History, Ethnology, and Archaeology. Edited by Rev. Stephen D. Peet. Chicago: Jameson & Morse. Vol. II., No. 2.

A very creditable and thoroughly scientific periodical, doing good work in a field of real importance.

THE ANTIQUARY. A Magazine devoted to the Study of the Past. Edited by Edward Walford, M.A. New York: J. W. Bouton. No. 1, Vol. I.

A thoroughly English magazine likely to delight the dilettante gatherer of antiquated trifles, devoted chiefly to historical and biographical matters pertaining to the British islands and the British people.

HOW TO LEARN SHORTHAND. By Arthur M. Baker. New York: S. R. Wells & Co. Paper, pp. 43.

Claims to be an improvement upon Taylor's system of shorthand, and to be the simplest, most practical, and the best adapted system of shorthand for reporting. There are probably not more than twenty systems before the public that are better.

THE REFUTATION OF DARWINISM AND THE CONVERSE THEORY OF DEVELOPMENT. By T. Warren O'Neill. Philadelphia: J. B. Lippincott & Co.

Another illustration of the faculty with which the theory of evolution can be overturned by those who have but a second hand knowledge (and little at that) of the facts of natural history. As a constructive theorist Mr. O'Neill is as fearless as he is in the work of destroying Darwinism; but we do not apprehend that naturalists will be greatly influenced by his views.

THE SUGAR BEET: INCLUDING A HISTORY OF THE BEET SUGAR INDUSTRY IN EUROPE. By Lewis C. Ware. Illustrated. Philadelphia: Henry Carey Baird & Co. 8vo, cloth, pp. 323. Price \$4.

In addition to a detailed account of the varieties, qualities, cultivation, feeding value, etc., of the sugar beet as developed in Europe, this thoroughly practical treatise reviews at considerable length the history, present condition, and future prospects of the beet sugar industry in this country. The author is confident that before long the \$80,000,000 annual tribute we pay to foreign countries for sugar will be kept at home, and that the sugar beet will be one of the chief means for enabling the people of the United States to produce all the sugar they require.

SIXTH QUARTERLY REPORT OF THE PENNSYLVANIA BOARD OF AGRICULTURE. Harrisburg: Lane S. Hart, State Printer.

Contains a report of the fall meeting of the Pennsylvania Board of Agriculture; reports of the past year's crops in comparison with the yield of the year before; the condition of growing crops and of farm stock; prices of farm products, etc. Also a useful paper on the lung plague among cattle, and other information of use to Pennsylvania farmers.

THE MICROSCOPE IN MEDICINE. By Lionel S. Beale. Philadelphia: Lindsay & Blakiston. 8vo. pp. 539. Price \$7.50.

This is the fourth edition of Professor Beale's well known treatise much enlarged. Most of the 500 illustrations have been drawn on wood by the author. The index, which contains over 2,000 references, fairly indicates the encyclopedic character of the work. It is somewhat remarkable that an edition for American use should not have contained some American names and addresses in the list of "microscope makers and others useful to microscopical observers."

THE COMPEND OF TAKIGRAPHY. By D. P. Lindsley. New York: D. Kimball. 12mo, paper, pp. 34.

Contains a summary of the principles of the simple style of takigraphy, a system of shorthand writing which deservedly ranks among the best.



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) C. H. B. asks how to color glue. A. Use any of the soluble coal tar aniline dyes.

(2) E. S. asks: 1. Could you suggest a clear transparent and quickly drying varnish to preserve sphymographic tracings on mica slides? A. Try the following: Gum juniper, 2 drachms 8 grains; gum frankincense, 1 drachm 10 grains; alcohol, 4 ounces. Filter through paper, and use the clear solutions. 2. Give a method by which the tracings could be transferred to a record book. A. We know of nothing better than a solar print.

(3) W. H. C. asks for the best acid or mixture for scouring and polishing copper. A. Solution of oxalic acid is commonly employed. Finish with whiting.

(4) C. R. writes: We are using the condensed water from exhaust steam in the boiler, and find that the grease in it makes the boiler foam. Would coal oil cut the grease and precipitate it so that we could blow it off? If not, what do you suggest? A. Try a small quantity of lime (caustic) and use the blow-out. Petroleum would be of little use.

(5) I. G. B. asks the name of the very bright star now to be seen near the horizon about due south. Please state all that will be of any interest. A. It is Sirius, the dog star. It is estimated that it gives us four times as much light as any other star visible in our latitude. It was for a long time supposed that Sirius had a companion, but it was not actually seen until February 1862, when the younger Mr. Clark, of the firm of Alvan Clark & Sons, the well known telescope makers, turning upon the star the eighteen inch glass then just completed for the Chicago Observatory, saw it. The satellite was discovered exactly in the predicted direction for that time, though the discoverer was not aware of this fact at the time.

(6) A. B. asks how to make emery belts for polishing spokes and other wood work. A. Take emery or sharp sand, spread it out on an iron plate heated to about 200° Fah. Apply to your straps or belts a rather thin coating of strong glue, then press it upon the heated emery or sand. Either leather or cotton webbing may be used for the belt.

(7) B. J. R. asks: How is carbon tracing or copying paper used for duplicating writing in pencil prepared? A. Rub into a suitable tissue a mixture of 6 parts of lard, 1 part of beeswax, and sufficient fine lamp black to give it a good color. The mixture should be warm and should not be applied to excess.

(8) J. H. P. asks where to find a full explanation of the theory that the top of a carriage wheel moves faster than the bottom when the carriage is moving. A. P. 394, Vol. 39, SCIENTIFIC AMERICAN.

(9) A. S. G. writes: Tell J. B. R. (No. 40, in No. 8) that I have had exactly the same experience as he, with four Watson cells, and, after charging it to every cause but the right one, removed the trouble by taking out the zincs and cleaning them with a stiff brush. I know this is contrary to directions, so much the worse for them.

(10) G. L. B. asks: What is the ratio of increase of resistance to that of speed, to an object drawn through water? A. Nearly as the square of the velocity; at high velocities not quite so much, as the friction does not increase as the square of the velocity.

(11) W. J. P. writes: In your issue of February 28, in "Notes and Queries," No. 10, W. E. K. asks how to take a large coal oil spot out of a carpet. If it is of any value, I give you my experience: A kerosene lamp was carelessly dropped in the center of my parlor carpet. I drew the tacks nearest to it and drew out the paper under the spot and put in four thicknesses of newspaper. I then strewed over the spot common whiting to the depth of about half an inch, which I covered with a large paper to prevent tracking, etc. I left it a week, and then scraped up the whiting and raising the carpet a few inches from the floor I whipped it with a light switch to start the whiting, after which the spot was carefully swept. The oil had disappeared. This was four years ago, and no brighter spot is on the carpet than the place so treated.

(12) A. M. M. asks: 1. Will any kind of battery answer for silver or gold plating? If not, which is best? A. For light work the Smee battery is generally used. For heavy work use a carbon battery with electro-poin fluid in the porous cell. 2. How are solutions prepared for silver and gold plating? A. For silver bath, see p. 27 (2), Vol. 41, SCIENTIFIC AMERICAN, for gilding bath, see SUPPLEMENT, 160. 3. Can an electric lamp be operated with a battery? A. Yes, but not economically. It will take 50 cells of Bunsen battery to get a fair light. Better use a machine.

(13) J. G. S. asks: 1. What wire is it necessary to use between stations using the telephone described in No. 142, SCIENTIFIC AMERICAN SUPPLEMENT—that is, size; material, copper, or iron? A. Use No. 9 galvanized iron wire. 2. Is there any simpler calls than those described in SCIENTIFIC AMERICAN SUPPLEMENT in No. 162? A. A single stroke electric bell is the simplest call.

(14) P. T. writes: One party claims that anchor ice runs at night and whatever it touches it clings to. An opposite party claims that it does not run at night, but freezes on the bottom, and rises and runs when the sun warms the water sufficient to loosen from the bottom. Which is right? A. The latter.

(15) M. P. B. writes: 1. Suppose a perfectly round wheel to be rolling on a perfectly smooth surface, is the part of the wheel which touches the surface on which it is rolling at rest for the instant? A. Yes. 2. Does a cane gun come under the head of concealed weapons? If so why? A. Yes, because the weapon is concealed or disguised. 3. Does the piston rod of an engine come to rest at the end of each stroke before beginning the next? A. Yes.

(16) D. O. asks: 1. Is an engine with cylinder 2 1/2 inches diameter by 5 inches stroke with 100 lb. steam powerful enough to drive a propeller 20 inches diameter with 36 inches pitch? A. Yes. 2. What speed may I expect with boat 22 feet long and 5 feet wide, of good model? A. With plenty of boiler, 8 miles per hour.

(17) E. S. asks: 1. Is it necessary that a locomotive engine have two cylinders. If so, why? A. Yes, so that the engines can be started from any position. 2. What size engine used as a locomotive will it require to draw 12 cars weighing 800 a piece up a grade 4 feet per 100, that is, not allowing for slipping of the drive wheels on the rails? A. Your data is quite insufficient; you do not give size of driving wheels, pressure of steam, or speed.

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

B.—Hematite and chalcopyrite.—W. K.—Not emery, but garnet in quartz.

COMMUNICATIONS RECEIVED.

- On Experiments in Magnetism. By H. E. E.
On Activity on Jupiter's Disk. By I. S.
On Russian System of Shop Instruction. By W. F. D.
On a Curious Dust Formation. By B. N.
On Copper Nails. By J. A. B.
On the Force and Heat of Light. By C. B. M.

[OFFICIAL.]

INDEX OF INVENTIONS

FOR WHICH

Letters Patent of the United States were

Granted in the Week Ending

February 10, 1880,

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, or any patent issued since 1867, 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 Alcoholic spirits, Amalgamator spindles, Animal trap, Bag holder, Baling press, Ballot box, Bed bottom, Bed spring, Bell electric call, Bell hanger, Belt galvanic, Belt tightener, Berth, Binding, Blacking box, Bolt and rivet machine, Book, memorandum, Books, cards, and paper, Boot and shoe, Bottle stopper, Bottle stopper and fastener, Bottle stopper fastener, Brake shoe, Bretzel machine, Brick, etc., Bridge, wooden truss, Buckboard, Burglar alarm and door bell, Button and button fastening.

Buttons, stud, etc., I. N. Capron..... 224,386
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