

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 "Finger Annunciator," and all other elect. apparatus, by the Finger Annunciator Co., 73 Cornhill, Boston.

Lubricants, Gear Grease, Cylinder and Machinery Oils. R. J. Chard, 6 Burling Slip, New York.

Wanted—A Foreman of experience, capable of running a Jobbing Machine Shop employing forty men. Address, with reference, W. C. & Co., P. O. Box 6, Chicago, Ill.

Improved Machinery for Waxing Paper for Sale, including an established trade. Price reasonable, profits good. For particulars, address Z. W., P. O. Box 778, New York City.

[From the Jackson (Miss.) Clarion.]

Mr. C. H. Manship, of Jackson, one of the best painters in that State, and a gentleman of great intelligence and worth, says, in reference to H. W. Johns' Asbestos Liquid Paints: "I have tested them fully, and am prepared to say that the paints, which are of all colors and shades, are not only the cheapest, but the best I have used in my experience as a painter for the past fifty years."

Skinner & Wood, Erie, Pa., Portable and Stationary Engines, are full of orders, and withdraw their illustrated advertisement. Send for their new circulars.

Carbon Plates. 48 Railroad Ave., Jersey City, N. J.

Recipes and Information on all Industrial Processes. Park Benjamin's Expert Office, 49 & 50 Astor House, N.Y.

Purves' Automatic Boiler Cleaner for removing impurities from the water in steam boilers, and keeping them cleaned and free from scale. Send for circular to Joseph T. James, No. 11 Franklin St., Chicago, Ill.

R. R. Hind, inventor of the new steam boiler described on page 358, current volume, may be addressed until July 16, 1880, in care of W. H. Crossman & Co., 118 Chambers St., New York.

Manufacturers of machines to cleanly remove hulls and germs from well soaked corn without injuring the rest, please address, with description and price, D. R. Garden, Room 22, Cooper's Union, New York City.

Asbestos Board on Chimneys prevents their heat from affecting the temperature of rooms through which they pass. Asbestos Pat. Fiber Co., lim., 194 Broadway, N. Y.

Air Compressors. Clayton Steam Pump Works, Brooklyn, N. Y.

Wilson's Business Directory, second edition, and Wilson's Co-partnership Directory for 1880-81, are now ready. Price, \$3 each. All orders addressed to the Trow City Directory Company, No. 11 University Place, New York, promptly attended to.

\$5 to \$20. A County Right. A Clothes Line Fastener. Sample by mail, 20 cents. J. A. Worley, Cleveland, O.

Air Compressors, Blowing Engines, Steam Pumping Machinery, Hydraulic Presses. Philadelphia Hydraulic Works, Philadelphia, Pa.

Sweetland & Co., 126 Union St., New Haven, Conn., manufacture the Sweetland Combination Chuck.

Power, Foot, & Hand Presses for Metal Workers. Moderate prices. Peerless Punch & Shear Co., 53 Dey St., N. Y.

The Brown Automatic Cut-off Engine; unexcelled for workmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

Corrugated Traction Tire for Portable Engines, etc. Sole manufacturers, H. Lloyd, Son & Co., Pittsburg, Pa.

For the best Stave, Barrel, Keg, and Hoghead Machinery, address H. A. Crossley, Cleveland, Ohio.

Collection of Ornaments.—A book containing over 1,000 different designs, such as crests, coats of arms, vignettes, scrolls, borders, etc., sent on receipt of \$2. Palm & Fechteler, 408 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.

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

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

Steel Figures, \$1; Letters, \$3 a set. York & S., Clev., O.

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.

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. 365.

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.

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

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.

Forsyth & Co., Manchester, N. H., & 207 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.

For Alcott's Improved Turbine, see adv. p. 234.

Burgess' Non-conductor for Heated Surfaces; easily applied, efficient, and inexpensive. Applicable to plain or curved surfaces, pipes, elbows, and valves. See p. 284.

Eclipse Portable Engine. See illustrated adv., p. 349. Telephones repaired, parts of same for sale. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

4 to 40 H. P. Steam Engines. See adv. p. 348. For best low price Planer and Machinery, 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 Schielicher. Schumm & Co., Philadelphia, Pa. Send for circular.

Blake "Lion and Eagle" Imp'd Crusher. See p. 365.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 365. Totten & Co., Pittsburg.

Silent Injector, Blower, and Exhauster. See adv. p. 364.

Horizontal Steam Engines and Boilers of best construction. Atlantic Steam Engine Works, Brooklyn, N. Y.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'rs, 23d St., above Race, Phila., Pa.

Peck's Patent Drop Press. See adv., page 364.

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10,000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free.

Brass & Copper in sheets, wire & blanks. See ad. p. 365.

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

For Superior Steam Heat. Appar., see adv., page 365.

We will purchase or manufacture on royalty, Stationers' Articles of real merit. A. C. Farley & Co., Phila., Pa.

Valve Refitting Machine. See adv., page 364.

Cut Gears for Models, etc. Models, working machinery, experimental work, manufacturing, etc., to order. D. Gilbert & Son, 212 Chester St., Phila., Pa.

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

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 366.

The best Truss ever used. Send for descriptive circular to N. Y. Elastic Truss Co., 683 Broadway, New York.

Inventors' Institute, Cooper Union. A permanent exhibition of inventions. Prospectus on application. 733 Broadway, N. Y.

Improved Work Holder for Lathes, Gear Cutting, Attachments for Lathes, Tyson Vase Engine, Small Steam Motor. No boiler, no danger. Send for new catalogue, 1880. Jackson & Tyler, Baltimore.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 365.

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.

New Economizer Portable Engine. See illus. adv. p. 365.

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, 78 Broadway, New York.

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

Hand Fire Engines, Lift and Force Pumps, for fire and all other purposes. Address Rumsey & Co., Seneca Falls, N. Y., and 93 Liberty St., N. Y. city, U. S. A.

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

NEW BOOKS AND PUBLICATIONS

HUBBARD'S RIGHT HAND RECORD AND NEWS-PAPER DIRECTORY, 1880. New Haven: H. P. Hubbard. Price \$1.50.

The favorable opinion of Hubbard's Right Hand Record, expressed by us last year, is equally justified by this year's issue. It gives a complete list of all the newspapers published in America, and all the leading newspapers of the world. The names are arranged in alphabetical order under the towns of each State (also alphabetically arranged), with population of town, circulation of paper, blank spaces for advertising records, etc. Business men cannot fail to find it right handy as well as useful.

Notes & Queries

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) D. J. F. writes: I would like to get a book by which I could get the correct way of getting at the lead and lap and cushion of steam engines, and what cushion and what lead are required of engines of different sizes and speeds; likewise some information of compound engines and their handling; in fact a book of plain questions and answers which any man can see into. A. Consult "Roper's Land and Marine Engines," "Ed-

wards' Catechism of the Marine Engine," "Forney's Catechism of the Locomotive."

(2) G. R. C. writes: Referring to "Notes and Queries," No. 15 (May 1), we do not understand what is meant by T=latent and sensible heat. A. T=sum of latent and sensible heat—sensible heat of steam at the pressure of the atmosphere is 212°, and the latent heat 65°, sum=277°. 2. With water at 50° and steam 690 lb., what percentage of fuel is saved by using water at 100°, also at 150°? A. You can have no water at 50°. With steam pressure at 60 lb. pressure, it will be about 30%.

(3) J. N. H. asks: Does electricity pass between two points more easily in air than in a vacuum? A. More easily in air than in a high vacuum, as it is possible to create a vacuum so perfect that a spark will not pass at all. The spark passes more easily through rarefied air than through air at the ordinary density.

(4) E. L. F.—A good common black ink is prepared as follows: Dissolve 15 parts extract of logwood in 900 parts of water, allow to deposit, heat to boiling, and add 4 parts crystallized sodium carbonate. Dissolve in 100 parts of water 1 part of yellow potassium chromate, and add this drop by drop, with constant stirring, to the logwood solution. After standing for a few hours the ink will have assumed a full bluish-black color.

(5) J. M. asks: 1. Do you know of any solution with which to moisten tissue paper in order that a press copy may be taken from writing which has already been once copied, or from writing too old to copy from ordinary water moisture, and which will not discolor the paper? A. Try a weak solution of tannic acid. 2. In looking over my back numbers of SCIENTIFIC AMERICAN I found a receipt in No. 11, Vol. 35, page 171, query 8, which I tried, but without success; it also colored the paper green. Or is there any ink from which two press copies may be taken with an interval of about a week or ten days between the copies? A. A strong aqueous solution of aniline blue, violet, or black (soluble nigrosine) will answer your requirements very well.

(6) H. O. asks: What are the exact proportions of sulphur, lampblack, and niter in gunpowder? A. English war powder—niter 75 parts, sulphur 10, charcoal 15. French war powder—niter 75 parts, sulphur 12½, charcoal 12½. Sporting powder—niter 76.9 parts, sulphur 9.6, charcoal 13.5. Blasting powder—niter 62, sulphur 20, charcoal 18.

(7) T. R. M. writes: I have a large wooden cask for holding maple sap. What could I paint it with on the inside, to prevent the sap from penetrating the wood and souring, that would not injure the sap? A. Have you tried melted resin colophony?

(8) E. K. writes: I have a good deal of copper plating to do. The solution I have, I succeeded so far of obtaining a nice bright copper color, but it will not keep. After I washed it off with warm water and exposed to the air for half an hour it turned into a rusty brown. My solution consists of Schwefelsaures Kupfer dissolved in water with some sulphuric acid. How can I make the right kind of solution for such purpose? A. Use a saturated aqueous solution of copper sulphate (blue vitriol). Clean the work thoroughly by boiling in strong soda solution, pickling in dilute sulphuric acid, and scouring with clean sand, if necessary. If the work is iron use a strong battery at first.

(9) R. A. P. asks (1) for a certain and yet safe exterminator for roaches or croton bugs. A. Powdered borax does very well if properly used. Inject it, by means of a small bellows, into all the crevices and holes.

(10) F. C. R. asks: 1. Why are rotary engines not used for all the purposes of an engine? A. Because it is almost impossible to keep them tight under the conditions of constant use, and it is difficult to arrange them to work expansively to the desired extent. 2. Is there any method of reversing a rotary engine? If so, where can I find information regarding it? A. There is no difficulty in reversing them. You can find description in almost any history of the steam engine and in the back numbers of the SCIENTIFIC AMERICAN.

(11) F. G. N. writes: 1. I am building a light paddling canoe, according to the descriptions contained in the SCIENTIFIC AMERICAN SUPPLEMENT, Vol. ix., No. 219, page 3484, and do not understand how to make the watertight bulkheads. A friend told me that the sides in which the slats are made are curved by steam. Explain the building of the watertight bulkheads in your valuable paper, and if curved by steam, please tell me how it is done. A. Make the bulkheads of rubber cloth or cotton canvas painted, closely nailed around the edges. The sides are steamed in an ordinary steam box and bent to shape and fastened on a proper form and left to dry on the form.

(12) L. V. A. asks for a remedy for removing freckles and tan from the face. A. The following has been recommended: Sulpho-carbolate of zinc 2 parts, pure glycerine 25 parts, rose water 25 parts, alcohol 5 parts. Apply twice daily for a half hour.

(13) N. L. writes: I am building a small horizontal double cylinder steam engine, two and a half inch bore and four inch stroke, what is its power? A. At 260 revolutions per minute, 2½ horse power. 2. How large a fly wheel will it require? A. About 16 or 18 inches diameter. 3. What is the number of threads to the inch in machine taps standard from ½ inch to 4 inches? A.

Table with 2 columns: Diameter in inches and Threads per inch. Values range from ¼ inch diameter to 4 inch diameter.

4. Do you think the iron mercury flasks would be strong enough to run the above engine? Where can I buy them? A. Yes, you can generally obtain them from druggists.

(14) W. L. H. asks: How much lead of the valve should the valve of a 100 horse power engine have, and what is the rule for giving a valve the required amount of lead? A. Probably about three-sixteenths inch. There is no rule; it depends upon pressure of steam, size and form of opening, and the velocity of the engine.

(15) A. M. asks: Is steam applied successfully to plowing? A. It has been in England, but we believe not in this country.

(16) E. W. S. asks for directions for making paste such as is used for making paper matrices for newspaper stereotyping. Would like to have directions for making the back and face paste. A. Starch and fine glue, equal parts; soften the glue by digestion over night in cold water; then dissolve it in enough hot water to make a thin size; boil the starch in water to form a clear paste; add this to the glue and stir together; thin with hot water when necessary; warm before using.

(17) W. S. H. asks: 1. How long should work be left in the nickel bath for a good deposit, if everything be in good working order? The bath is composed of sulphate of nickel and ammonia. A. About twenty minutes is usually allowed, but with a weaker battery several hours may be allowed and better work will result. 2. What should cause the work to turn out black and rough? A. The battery used is much too strong; use a more moderate current. 3. Is there any work printed on nickel plating? I have the SCIENTIFIC AMERICAN from Vol. 32, and all the SUPPLEMENTS, but do not find much in them about it. A. You will find a good article on this subject on p. 209, Vol. 33, SCIENTIFIC AMERICAN.

(18) C. H. J. asks how much a rod of common round iron, one inch in diameter, fifteen to eighteen feet long, will support on a steady strain. A. If of good iron, 3,800 lb. safely.

(19) G. W. F. asks: For what purpose is ground or powdered mica used? A. It has been used in loading some kinds of paper, in the preparation of paints and bronze powders, in connection with nitroglycerine for certain explosives, as well as in toys. It makes an excellent fertilizer in soils deficient in alkalis.

(20) M. M. L. writes: I have a small steam yacht, 28 feet over all, 8 feet beam, propelled by a 4 fluke 28 inch diameter screw; the engine is an ordinary upright link motion. Everything works very nicely except the valve to the engine, which wants facing. How shall I face it in good shape? A. If you have not access to a good planing machine, you must face it by hand, with file and scraping tool.

(21) H. S. H. asks which has the most power, 2 cylinders 8x10, connected to one shaft with an 8 foot driver or fly wheel, or one cylinder 10x18, with an 8 foot fly wheel—both to run 125 revolutions per minute. A. 10x18 inch, making the same number of revolutions per minute.

(22) E. D. F. writes: I have very nearly completed a small upright steam engine, diameter of cylinder 3½ inches, stroke 6 inches, which I intend to run at 300 revolutions per minute. I have put on a balance wheel, 24 inches diameter, and will belt from a 12 inch pulley. How much power ought I to obtain from such an engine with 50 lb. of steam? A. Two horse power nearly.

(23) G. H. P. asks: What size boiler will it require for 1½ inch cylinder, and what should be the length of stroke? A. The stroke may be three inches to four inches; the boiler should have eight to ten feet heating surface.

(24) W. O. T. asks (1) the proper width and thickness for the packing ring of an engine, 1½ inch bore and 3 inch stroke. A. 3-16 to ¼ inch thick and ¼ inch wide. 2. Would the ring be better made of brass than cast iron? A. No. 3. Why are two rings used on large engines? A. To have one set break joints with the other, so as to prevent leakage and to give greater elasticity.

(25) S. B. M. asks: 1. Is the forked top on a lightning rod any better than a straight one, both being made of the same metal (copper)? A. A forked top is generally considered best. 2. I have a 30 inch wood saw, with a 150 lb. balance wheel on end of saw mandrel; saw makes about 500 revolutions to one of the horse power. I cannot get power enough in sawing large wood. Some claim it would run better without balance wheel; but I think the driving pulley is not large enough. What is the trouble? A. Keep on your balance wheel, and use two horses if one has not sufficient power. 3. Would a boiler, 10 inches diameter, 20 inches long, be sufficient to run a 1x2 engine about 45 revolutions per minute—boiler to set in a stove same as a teakettle? A. Yes. 4. Would copper, such as stove boilers are made of, be heavy enough for the boiler, and what pressure would it stand? A. Use copper three times as thick as that used in stove boilers.

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

L. L. L.—1. Labradorite and hornblende. 2. Same as No. 1, but with more of the hornblende and also orthoclase. 3. Garnetiferous sandstone with hornblende. 4. Hornblende rock.—T. W. G.—Pyrrhotine containing a small quantity of arsenic and antimony. It cannot be called an ore. It is of very little economic value.—D. C. K.—It is a fine silicious stone, probably of infusorial origin. It might be useful for polishing purposes if obtainable in powder or blocks free from coarse impurities.—A.—It is not a meteorite, but a fragment of altered hornblende rock, not valuable.—W. R. L.—It is galena—sulphide of lead, carrying a trace of silver.—G. I. L.—Metallic antimony.—E. G. T.—Mica schist of little value.—O. A. S.—Manganiferous clay iron stone.

COMMUNICATIONS RECEIVED.

On Gum Elastic. By A. T. Chemical Apparatus. By J. E. On Edison's Light. By D. F. On Quartz Crystals. By W. E. H.