

**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.

Telephones repaired, and parts of same for sale. Address P. O. Box 205, Jersey City, N. J.

Book Cover Protector. (See this paper of March 1.) Sales 25,000 first month. Patent for sale, or can be made on royalty. Address Way & Rankin, 62 Fulton Street, Brooklyn, N. Y.

Atmospheric Hammers, for sale, two, very cheap. Hill, Clarke & Co., Boston, Mass.

Improved Dynamo-Electric Machines for Electroplaters and Stereotypers. Price \$75 for 150 gallon machine. Equal to the best, at half cost of the cheapest. J. H. Bunnell, Electrician, 112 Liberty St., New York.

Linen Hose.—All sizes, with or without couplers, in any quantity. Greene, Tweed & Co., 18 Park Pl., N. Y.

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.

For Screw Cutting Engine Lathes of 14, 15, 18, and 22 in. Swing. Address Star Tool Co., Providence, R. I.

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

Lincoln's Milling Machines; 17 and 20 in. Screw Lathes. Phoenix Iron Works, Hartford, Conn.

Boilers ready for shipment. For a good Boiler send to Hilles & Jones, Wilmington, Del.

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

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.

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

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

Bradley's cushioned helve hammers. See illus. ad. p. 29.

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

Improved Blind Staples. B. C. Davis, Binghamton, N. Y.

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

Vertical Burr Mill. C. K. Bullock, Phila., Pa.

Eclipse Portable Engine. See illustrated adv., p. 414.

Eagle Anvils, 9 cents per pound. Fully warranted.

Diamond Saws. J. Dickinson, 64 Nassau 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.

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.

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

The best Friction Clutch Pulley and Friction Hoisting Machinery in the world, to be seen with power applied, 95 and 97 Liberty St., New York. D. Frisbie & Co., New Haven, Conn.

No gum! No grit! No acid! Anti-Corrosive Cylinder Oil is the best in the world, and the first and only oil that perfectly lubricates a railroad locomotive cylinder, doing it with half the quantity required of best lard or tallow, giving increased power and less wear to machinery, with entire freedom from gum, stain, or corrosion of any sort, and it is equally superior for all steam cylinders or heavy work where body or cooling qualities are indispensable. A fair trial insures its continued use. Address E. H. Kellogg, sole manufacturer, 17 Cedar St., New York.

Wanted, the address of parties who manufacture steel tubing; also iron tubes. Address L. F. Standish & Co., New Haven, Conn.

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

Type Writer, \$45. W. Main, Piermont, N. Y.

Makers of Engines, Lathes, Jig Saws, etc., for amateur use, send circulars to 300 York Ave., Phila., Pa.

Steam Engines, Automatic and Slide Valve; also Boilers. Woodbury, Booth & Pryor, Rochester, N. Y. See illustrated advertisement, page 29.

Tight and Stock Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus'd adv. p. 30.

Best Turkey Emery in bbls., kegs, and cases. Special rates for large quantities. Greene, Tweed & Co., 18 Park Place, New York.

For Sale—Light draught stern wheel Steamboat, 25 ft. long; cheap. Haase Bros., Oak Park, Ill.

Factory Fire Hose.—A large lot good Cotton Hose for sale cheap. W. F. Corne, Agent, 117 High St., Boston.

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

The advertisement of The Aultman & Taylor Company, which attracted so much attention last week, will appear again in the next issue.

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.

The American Watch Tool Company, Waltham, Mass., can cut standard Taps and Screws from 1-100 of inch diameter upward, of any required pitch.

The immense Printing Establishment of Messrs. Harper & Bro. is now being painted with H. W. Johns' Asbestos Liquid Paint.

Sawyer's Own Book, Illustrated. Over 100 pages of valuable information. How to straighten saws, etc. Sent free by mail to any part of the world. Send your full address to Emerson, Smith & Co., Beaver Falls, Pa.

Pattern Makers can get Metallic Pattern Letters to letter patterns, of H. W. Knight, Seneca Falls, N. Y.

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

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

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

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

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

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.

Pulverizing Mills for all hard substances and grinding purposes. Walker Bros. & Co., 23d & Wood St., Phila., Pa.

**NEW BOOKS AND PUBLICATIONS.**

LEFFEL'S WATERWHEEL BOOK. Springfield, Ohio: James Leffel & Co. 1879-1880.

The James Leffel turbine water wheel may fairly be accounted one of the great prime movers of American mechanical industry, there being over 8,000 of them in successful use, giving nearly 500,000 horse power. One recently built for a mining company runs under a head of 300 feet, the highest head thus far utilized in this country. The descriptive book in hand is a new and improved edition, handsomely printed and full of information of use to owners of water powers of every description.

ILLUSTRATED MANUAL OF THE BOOKWALTER ENGINE. Springfield: James Leffel & Co.

The manual of the Bookwalter Engine is more pronouncedly a descriptive price list. It is worth consulting by any one contemplating the purchase of a small portable engine and boiler.



**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) S. T. C. asks (1) for directions for making a good ice box. A. Make the box and cover with hollow walls, which may be simply filled with air. The cover should fit well, and the box should be lined throughout with zinc. 2. Which makes the best of the following: Three thicknesses of good board or two thicknesses of board filled in with charcoal? A. The latter.

(2) L. 6 H. asks: Is it possible to well metallize by galvanoplasty, a large piece of clay or terra cotta work, such as a bust, natural size, or a group or statuette, and if so please let us know if there is a more efficient way to prepare it than the use of plumbago? A. It is difficult to impart a uniformly adherent coating of metal on such ware. A good method is to coat the ware with a varnish composed of shellac 6 parts, borax 1 part, boiling water q. s. to form a thick sirup. When this is nearly dry it is thickly and uniformly coated with a metallic bronze powder and thoroughly dried to about 110° Fah., before suspending in the "striking" bath. It is essential that the first film be thrown on expeditiously. After plating the articles may be placed for a short time in water heated to about 200° Fah.

(3) G. A. H. asks: 1. Will the gravity battery keep best on an open or on a closed circuit? A. The closed circuit is best. 2. Will tin on one side of the copper spirals make any difference? A. There should be no tin on the copper. You may remove the tin by heating the copper red hot and plunging it into water.

(4) H. H. C. asks: 1. Can two or more of the electric machines described in No. 161, SCIENTIFIC AMERICAN SUPPLEMENT, be worked together to advantage by foot power? A. No, it is not an easy matter to drive a single one. 2. Should the wires of the first connect with the magnet of the second? A. The wires might be connected in this way, but it would be better to make a single machine of double the size.

(5) C. B. B. asks: 1. How can I polish silver woods? A. Take rather thick alcoholic shellac varnish 2 parts, boiled linseed oil 1 part, shake well together before using. Apply with a rubber and rub

briskly until the varnish is hard and bright. 2. Could not a boat only large enough to carry one person be run by clockwork, and if not, why? A. Yes, but it would economize power by applying it directly to the propelling mechanism. 3. I intend making a barometer; how can I make the scale and have it correct? A. The barometer scale is simply a scale of inches, divided into tenths.

(6) H. R. M. asks the process by which the gloss is produced upon photographs, and whether the same process can be employed with what is termed heliotypes or artotypes, as published in some of the illustrated papers of New York, and if not, explain the means employed; also please state the difference between the two latter named terms. How can art or heliotype be mounted on cardboard suitable for albums? A. For albumen prints the warmed burnishing press used by photographers is all that is required, we believe. A rather weak solution of white wax in absolute alcohol is sometimes used as well for artotype or heliotype as for ordinary solar prints. It is simply sponged over the mounted print, which is then passed through the warm burnishing press, by which the fine gloss is imparted. Solution of bleached shellac in alcohol (1 to 10) is also occasionally used. Good starch paste is very generally used for mounting. For a description of heliotype processes consult Vogel's "Chemistry of Light and Photography." The artotype process so-called was patented by Johann B. Obernette, of Munich, in 1878 (208-14). It consists in forming first on a transparent or non-transparent plate a coating or film of albumen and soluble glass, and adding to this the sensitive film. The first coating is composed of: albumen 7 parts, soluble glass 3, water 8. The second or sensitizing bath is composed of: gelatine 50 grammes, fish glue (isinglass) 50, ammonium bichromate 15, water 1 liter. Filter for use.

(7) O. E. P. writes: In your issue of June 21, "Notes and Queries," (30), D. J. W. asks for a receipt for blue writing ink. I make it by dissolving the common preparation sold in every grocery, known as "Sawyer's washing blue," in clear water. It dissolves instantly, does not give much trouble by thickening, and never fades. Any desired shade may be had by varying the quantity of water. I have used it for measure lines on mechanical drawings made 10 years ago, and it is as bright now as when put on.

(8) O. A. R. asks: 1. Has there ever been an invention made to work two telegraph instruments at once on the same line? A. Yes, and it is common to transmit four messages simultaneously over a single wire. 2. How can I take the rust off the brass of an instrument? A. You should remove it with fine emery paper or crocus cloth or paper. 3. How many jars will it take to run telegraph line with a loop of 1,800 feet wire—900 each way, size of wire No. 18, soft iron? A. It depends altogether on the resistance of your instruments. No. 18 wire is too small; use No. 10.

(9) C. A. V. asks if gutta percha and India rubber can be dissolved and mixed by boiling together in any liquid. A. Caoutchouc and gutta percha are both quite soluble in naphtha, benzole, and carbon disulphide. The latter, when mixed with about six per cent of absolute alcohol, is one of the best solvents. The solution is performed in the cold (best in the open air), as it would not be safe or economical to heat these volatile and inflammable liquids. Exposed to the air the solutions soon evaporate, leaving the gums in their original condition.

(10) B. M. asks how many Tom Thumb batteries, made in the manner described on page 101 of the SCIENTIFIC AMERICAN Reference Book, would it take to raise 1/2 inch of No. 40 platinum wire to a red heat. A. About forty.

(11) W. W. B. asks: What can I use to remove rust from small watch pinions that will not cause the pinion to rust after applying? A. Soften with oil and apply a little emery flour.

(12) S. T. asks (1) if water becomes purified by freezing. A. Water is purified from most contaminating substances by crystallizing (freezing). 2. Will it purify itself by running a few miles? A. It depends very much upon the nature of the soil or bed; over a gravelly bed, usually yes.

(13) W. J. R. writes: In your answer to query No. 36, to "Student," page 380, current volume, June 14, you say his engine 8x12 in. is "badly proportioned" to produce the power estimated by him, namely "100 lb. pressure, 100 revolutions—245 horse power." Will you please state why? A. Because of the loss at every stroke by the clearance and waste spaces.

(14) B. P. C. writes: I am running an engine of about 6 horse power, 8 inches stroke, driving wheel 30 inches, makes 200 revolutions per minute, belted to a 48 inch wheel on shaft which makes 130 revolutions per minute. Am about to change to an engine of 12 horse power, 12 inches stroke, with driving wheel of 48 inches. What size wheel do I want on shaft, and what number of revolutions of engine, to produce the same result, namely, 130 revolutions of shaft? A. If you run your new engine 130 revolutions per minute you need not change your wheel; as you have equal diameter on both shafts, the driven shaft will run same speed as the engine.

(15) "Medicus" asks: When water and other bodies are freezing, heat is given out, and when water or the same bodies are thawing, cold is given out. Some of our elementary text books upon natural philosophy teach this. Is it true, and what is the *modus operandi*? A. Condensation is accompanied by an elimination of heat; liquefaction by an absorption of heat (from surrounding bodies). Consult Professor Tyndall's "Heat as a Mode of Motion."

(16) W. M. writes: In nearly all works referring to the computation of indicated horse power of steam engines from indicator cards of the same, the rule for finding the mean effective pressure during any stroke of piston assumes that the back pressure during that stroke is shown on the same card as shows the initial pressure. Should not the pressure on the opposite side of piston be obtained for the opposite card, and

the mean effective pressure computed therefrom? A. Yes.

(17) W. H. M. asks: 1. Is it necessary to level an engine (portable) both ways, across and parallel with the valve seat? A. No, the necessity for leveling is that the heating surfaces of the boiler may be properly covered. 2. In lining up a cylinder of a portable engine, where the slides are attached to the front cylinder head, how would you line it up—line the slides or the other parts first? A. Line everything by the center line of the cylinder in one direction, and by center of shaft in the other. 3. Would it be necessary to have front cover upon the cylinder and then stretch line? A. No.

(18) J. G. writes: F proposes to put a windmill wheel on an ordinary hand car and gear it from said wheel, and contents it will propel the car against the wind, size of wheel optional. Opposition say no. Please decide. A. F is right, if he uses properly proportioned gearing, but the speed will be low.

(19) G. A. D. asks for the process of making lime water. A. Agitate an ounce of pure caustic lime in a pint bottle nearly filled with water, and after the lime has subsided decant the clear supernatant liquid. It must be kept in well stoppered bottles.

(20) J. R. L. asks: What is the best way to get water up a hill 28 feet rise and 60 feet distant? If suction pump, what size? We want water to supply steam engine on top of hill. A. You can use a pump driven by your steam engine, or if you have a sufficient reservoir on top of the hill, a pump driven by a windmill. Size of pump depends upon the quantity of water you wish to raise.

(21) J. D. M. asks how to test water to ascertain if there is lead in it. A. Evaporate a sample of the water nearly to dryness, and mix the remainder with a small quantity of sulphureted hydrogen water (hydro-sulphuric acid). The formation of a precipitate or of a dark precipitate or cloud indicates lead. 2. To find out whether there is any decaying substance in my well? A. Treat one sample of the water with a cold saturated solution of tannic acid, another with enough dilute solution of potassium permanganate to produce a faint color; if a slight gelatinous precipitate forms in the first, even after 24 hours' standing, or if the latter quickly loses the color imparted by the permanganate, the water should not be used.

(22) A. M. writes: It is stated that in a boiler (with all the flues and crown sheet covered with water) where the fire is direct and intense the water assumes a spheroidal form and is not in contact with the plates at all. It is said that the master mechanic of some Eastern railroad had proved it by inserting a small pipe in the smoke arch end of a locomotive until it reached the flue sheet of the fire box, and nothing issued but blue steam, and he got no water until he drew it away from the fluesheet for half an inch, and in another case a pipe was introduced through the top of return flue boiler until within three eighths of an inch of the bottom sheet, and upon opening the cock a small quantity of water (that had stood in the pipe) came forth and then nothing but steam, nor did he get any more water until he removed the lower end of the pipe three quarters of an inch from the bottom of the boiler. It does not look likely. What is your opinion on the matter? A. This is a point that must be determined by the temperature of the fire and the conducting power of the metal. That the water can be driven from the metal surface has been frequently shown, but it does not occur under the ordinary conditions of a steam boiler, except when so badly designed that there is no proper circulation. In a locomotive boiler too small for its work and forced by a sharp jet the repulsion may occur.

(23) F. W. B. asks: 1. Would an engine 3x1 1/2 (three by one and a half) inches be large enough to run a boat fifteen feet long by thirty inches in width? How large a boiler would it require? A. Yes, at a moderate speed. 2. Would a boiler made of No. 17 copper, with 4 1/2-inch flues, made on the vertical plan, furnish sufficient steam? A. No. 3. Which is preferable for running on creeks and other shallow places, a screw or paddle wheel? A. For so small boats a screw running partly out of water.

(24) F. T. asks: Should any kind of oil be used on belts for elevators or driving machinery: if so, what kind? A. Neat's foot oil.

(25) G. O. L. D. writes: I have some soft rubber and "gold rags," containing gold leaf. By what process can I get the gold out of the rubber and rags? A. Incinerate on a hot iron plate, mix with about 2-3 its weight of a mixture of equal parts salt and carbonate of soda, and submit to a white heat in a Hessian crucible for about twenty minutes, adding a small quantity of niter occasionally; cool in the crucible—the button will be found at the bottom.

(26) T. H. K. writes that he has discovered that smoking coffee will cure consumption. [The active alkaloid (caffeine) in coffee suffers more or less complete decomposition under the circumstances, but the products yielded have little or no therapeutic value in this connection, as far as known. Smoking coffee berries will not cure pulmonary consumption, though it would doubtless prove a comparatively harmless if not pleasant substitute for tobacco.]

(27) C. H. M. asks: Why are not electro-magnetic machines used instead of galvanic batteries for telegraphing purposes? Can they not be so used? A. They are largely used for private lines.

(28) E. K. asks how to coat whitening and give it a gold color so that it can be burnished and leave some parts matt or dead gold color? A. Coat with gold size, and when this is nearly dry, apply gold leaf or a suitable brown powder.

(29) E. H. asks for a recipe for removing the gloss imparted to fine diagonal cloths after they are slightly worn. A. The glossiness cannot be permanently removed, since it is due to the loss of the nap. It may be temporarily remedied by the use of a little ammonia water.