

**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.

Wanted—The address of Manufacturers of Friction Clutches. Address Washington Ice Company, 79 Clark St., Chicago, Ill.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dujeon, 24 Columbia St., New York. Patent Steam Cranes. See illus. adv., page 158.

Wanted—An offer to furnish Paper Tape for printing telegraph instruments in large quantities. Apply by letter to Wm. H. Deane, 196 Fifteenth St., B'klyn, N. Y.

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.

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

The Baker Blower runs the largest sand blast in the world. Wilbraham Bros., 2318 Frankford Ave., Phila., Pa.

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

Wanted.—A first-class Machinist or Millwright familiar with hard wood working machinery; one who has had charge of men preferred. Give age, nativity, and experience. Address, with reference, Cincinnati Co-operative Company, Cincinnati, O.

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

Inexhaustible Beds of Kaolin or Clay.—Wanted experienced pottery men to take an interest in the white, pink, and yellow kaolin beds. Digging and shipping on cars will cost 50 cents per ton. M. J. Dobschutz, Belleville, Ill., Agent.

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 Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

Steam Yacht for sale. G. F. Sheard, Waltham, Mass.

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

\$300 Vertical Engine, 25 H. P. See illus. adv., p. 158.

Eclipse Portable Engine. See illustrated adv., p. 157.

Bradley's cushioned helve hammers. See illus. ad. p. 142.

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

Sheet Metal Presses, Ferracite Co., Brigetown, N. J.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Vocom & 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 8 1/2 foot Boring and Turning Mill for sale cheap. A first class tool. Hilles & Jones, Wilmington, Del.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. of Porter Mfg. Co., page 78.

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.

Fuller & Stillman, Chemical Engineers and Assayers, 40 Broadway, New York.

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

The genuine Asbestos Roofing forms the lightest and most economical roof in use. It can be easily applied by any one. H. W. Johns M'fg Co., 87 Maiden Lane, New York, sole manufacturers.

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.

Vertical and Horizontal Engines M'fd by Naeig & Bro., Allentown, Pa.

Renshaw's Ratchet (short spindle) uses taper and square shank drills. 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 wrought iron; tensile strength not less than 65,000 lbs. to sq. in. Circulars free. Pittsburgh Steel Casting Company, Pittsburg, Pa.

The new "Otto" Silent Gas Engine is simple in construction, easy of management, and the cheapest motor known for intermittent work. Schleicher, Schumm & Co., Philadelphia, Pa.

Machines for cutting and threading wrought iron pipe a specialty. D. Saunders' Sons, Yonkers, N. Y.

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

**NEW BOOKS AND PUBLICATIONS.**

SCIENTIFIC HORSESHOEING. By William Russell, Cincinnati; Robert Clarke & Co. 8vo, pp. 144. Price \$1.00.

An unpretending yet superior treatise on this important art, embodying the results of over 40 years of study and intelligent practical working as a horseshoer and manufacturer of horse shoes for general and special use. The anatomy, functions, and proper management of the horse's foot are described in a plain, straightforward manner, with fifty engravings showing the hoof in health and disease, normal and special forms of shoes, and kindred matters of value to farriers and horse owners.

INTEMPERANCE THE GREAT SOURCE OF CRIME. By A. B. Richmond, Esq. Meadville, Pa.; H. M. Richmond. Price \$1.50.

These "Leaves from the Diary of an Old Lawyer," as the sub-title describes them, embody an uncommonly cogent argument against the license system. The stories are well told and free from rant. Indeed its manly tone and temperate style are somewhat exceptional in "temperance" literature.

THE SILK GOODS OF AMERICA. By Wm. C. Wyckoff. New York: D. Van Nostrand.

There is no industry that is rising more steadily or more deservedly in popular favor than American silk manufacture. Mr. Wyckoff's brief account of the recent improvements and advances of this art in the United States is well calculated to help on the good work by showing the conditions which have determined the superiority of American silk goods. In addition to a dozen chapters on the manufacture and special characteristics of the several sorts of silk goods, the volume contains the Seventh Annual Report of the Silk Association of America, summarizing the progress made during the past year, and a directory of American silk manufacturers and dealers, and raw silk importers and brokers.

JOURNAL OF THE CINCINNATI SOCIETY OF NATURAL HISTORY. April, 1879.

With the present number, this excellent periodical—the organ of one of our most energetic natural history societies—enters upon its second volume. Its contents, as usual, are of great scientific interest, especially prominence being given, as in former numbers, to the subject of silurian paleontology. Professor A. G. Wetherby remarks at some length on the genus *pteroocrinus*; Mr. E. O. Ulrich describes three new genera and twenty-eight new species of fossils from the lower silurian at Cincinnati; Mr. S. A. Miller remarks upon the *Kaskaskia* group, and describes four new species of fossils from Pulaski county, Ky.; and Mr. Joseph F. James gives a catalogue of plants growing in the vicinity of Cincinnati. The latter is rendered doubly valuable from the fact of its containing a reproduction of Lea's list of Cincinnati fungi, which has been long out of print. Considering the number of botanists in the United States who have entered, or are entering, upon the study of mycology, the Cincinnati Society would be doing a great service to science if it would supplement this bare list of fungi by a reprint of the descriptions of new species as given by Mr. Berkeley in the now inaccessible Lea catalogue. We know of but a single copy of the latter rare pamphlet in New York city, and that is buried in a volume with other papers, where it would never be found by a student unless by accident.



**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. B. C. asks: Is there anything that will remove tincture of iron from clothes? A. Try pure hydrochloric acid diluted with its own volume of water, and rinse with plenty of water afterwards and then with a small quantity of dilute ammonia water.

(2) A. D. E. asks: Do you consider crude petroleum of any benefit in keeping a boiler clean where hard water is used? If good to use, how often and in what quantities and in what manner should it be used? A. In moderate quantity, and when properly used, petroleum has been found useful in preventing the formation of hard incrustations in boilers. See p. 18, current volume, SCIENTIFIC AMERICAN.

(3) S. W. O. asks (1) if there is anything better than camphor for preserving insects, butterflies, and moths. I have been using camphor for three years, and it is collecting on the insects so fast that in another three years they will be white with it. A. See p. 11 (40), Vol. 38, SCIENTIFIC AMERICAN. 2. The brass part of my microscope has become rusty; how can I get it off? A. Remove the lacquer with caustic soda, clean with emery flour, and relacquer. 3. What is the best cement for mending a large china fruit bowl which is broken across the middle? A. Use one of the receipts given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(4) G. C. R. writes: I desire to cement in a brass frame a glass tube through which kerosene oil flows. Can you inform me of a cement which can be used for the purpose, which is impervious to the oil, and which is not affected by it? A. Borax, 1 part; shellac, 4 parts; boiling water, sufficient to form a thin paste. Thicken with whiting and use hot. A small quantity of glue is sometimes added.

(5) C. M. D. asks (1) for a method of separating the copper from the settlings of a gravity battery, I wish to obtain the copper pure. A. Wash the copper in hot water and fuse it in a blacklead crucible. 2. Please give directions for making an electric light suitable to light a room 12x15, and the best battery for the purpose and number of cells needed. A. Use a battery of 30 bichromate cells. There are a number of suitable regulator lamps in the market.

(6) J. H. M. asks (1) how washing bluing (powdered) is prepared. A. There are several wash blues in the market: soluble Prussian blue, aniline blue, ultramarine, and neutralized sulphindigotic acid. See p. 969, No. 61, SCIENTIFIC AMERICAN SUPPLEMENT. 2. How is stove polish made in cakes? A. The best stove blacking consists of pure graphite or plumbago, reduced to a fine powder and rendered cohesive by strong pressure while moist.

(7) J. H. H. asks (1) whether a Holtz electric machine can be used instead of the induction coil in repeating the experiments of Professor Crookes given in SUPPLEMENT No. 189. A. Yes, but the electric discharges are less frequent and less controllable than where the induction coil is used. 2. How large a coil will be necessary for the experiments on a small scale; that is, not before an audience, but in a laboratory? A. A coil that yields from 1 to 1 1/2 inch spark. 3. Is the Sprengel pump figured in Ganot's Physics, eighth English edition, capable of forming a vacuum of the exhaustion required, or are there better methods of creating a vacuum? A. The Sprengel pump, or some modification of it, will produce as perfect a vacuum as can be made.

(8) K. P. M. writes: I have a well and spring water, and analyzed them according to instructions from SCIENTIFIC AMERICAN, and found in the well water a strong trace of chloride of sodium, in fact it turned milky, and it lost its color under permanganate test. The spring water has no trace of chlorides; it keeps its color under permanganate test, but there is considerable sediment in the bottom. Now, is the spring water fit to use? A. Probably, but we cannot judge fairly from your statements.

(9) W. F. J. asks what is applejack, and how is it made. A. A high spirit made chiefly from cider by distillation. A brandy made from apples.

(10) F. F. S. asks how to remove plaster stains from a cherry and maplewood floor. The floor was covered with dry sand, but the mortar from plaster dropped on it struck through. A. Try rubbing the spot with a little dilute hydrochloric acid. Dry thoroughly and oil.

(11) G. W. M. writes: 1. I notice that some of the leather I have used for valves and plungers for wooden pumps, in a year or two grows hard and stiff. What kind of leather should I use that will remain soft and pliable? A. Leather thoroughly saturated with lard oil will retain its flexibility indefinitely under the circumstances. 2. Is there anything not poisonous with which tin pipe may be coated inside that will prevent its rusting for six or eight years? Would soluble glass answer the purpose? A. Try a platinum varnish. Soluble glass will not answer.

(12) C. M. asks how the beautiful blue black color on the guards and heelplates of some guns, particularly those of Colt and Parker, is obtained. We have tried pulverized charcoal and heated sand, but the color is either blue with a reddish cast or a light green. Can it not be done with sulphur somehow? A. It is done by first heating the articles until they become blue and then gray, and then allowing them to cool; they are afterward heated until they again become blue.

(13) T. McD. asks if copper wire (for an induction coil) can be insulated as perfectly by long strips of silk as by the usual way, the silk to be about 1/4 inch wide and any number of feet long, and to be put on lengthways of course. A. This method of insulation is not practicable, as the ribbon would take a great deal of room and would be troublesome to apply. Better make an apparatus like that shown on p. 124, current volume of SCIENTIFIC AMERICAN, and cover your wire with thread.

(14) S. A. B. writes: 1. Of two similar iron vessels of same capacity, one containing compressed air to 300 lb. per square inch, and the second acting as boiler and generating steam to 75 lb. per square inch, which will explode with the most violent and disastrous results, and under what conditions? Which is the safer? A. Compressed air is safer; it does not scald. When a steam boiler explodes a portion of the water expands into steam, thereby greatly increasing the volume of steam. This accounts for the powerful effects of boiler explosions. 2. How long will the vessel containing compressed air (say capacity=3 cubic feet) supply 20 cubic inches of air at a uniform pressure of 50 lb. per square inch? A. We cannot answer this without knowing pressure of the compressed air. 3. What is the capacity and what pressure do compressed air vessels usually carry? A. Pressure 300 to 400 lb., capacity to suit purpose. 4. At what point in the cylinder will the piston be when engine is at half stroke, that is, crank at right angle with piston rod? A. Depends upon length of connecting rod.

(15) J. S. asks: What is the best way to kill insects, for collections, so that their legs will not contract? A. Dip them in turpentine or chloroform.

(16) H. B. writes: In your issue of 12th instant, page 24, 7th paragraph, speaking of the fossil bones of the moa Mr. Haas says: "The massive limbs, larger than those of the heaviest ox, had evidently been broken to extract the marrow." Query: Do birds have marrow in their bones? A. Some of the bones of birds have large marrowless spaces.

(17) G. L. asks how to make sand paper. A. Crush glass under a muller and sift it into about six sizes. Coat a good quality of manila paper with thin glue and dust the pulverized glass over it. Sometimes two coats of glue and glass are thus applied to the paper.

(18) J. S. B. asks (1) how to find out the quantity of water a pump will furnish, at 40 strokes per minute, in one hour, each stroke 0-22 gallon per stroke. A. 40 strokes per minute is 2,400 per hour, and 220e hundredths of a gallon per stroke, 2,400x0.22=528 gallons per hour. 2. I copy the 0-22 gallons per stroke from the circular advertising the pump. Does it signify 22-100 of a gallon? A. 0-22 gallon = 22-100 of a gallon.

(19) D. W. M. asks how to arrange an electric bell with a telegraph circuit so that when the circuit is broken it will close a local battery and ring the bell. A. Arrange a relay so that when the armature falls away from the magnet it will close the local circuit.

(20) A. B. P. asks (1) how a current of electricity is generated in the wire around a permanent magnet in the Bell telephone? A. The vibrations of the diaphragm in front of the magnet disturbs the normal condition of the magnet; any change of magnetism in this generates electrical currents in the surrounding helix. 2. Does the wire touch the magnet or membrane? A. No. 3. Is it necessary that the membrane be metal; would it not be better to make it out of thin sheet rubber, with a piece of metal glued to it in the center? A. It should be soft iron. 4. Does it weaken a permanent magnet to revolve an armature close to it? A. No. 5. Can I change the pole of the electro-magnet so that it will attract and then repel? I want to make an electric engine. A. Yes.

(21) C. A. P. writes: 1. We have put up a siphon in our mines to take out the water according to description on page 315, No. 20, Vol. 36 (25), SCIENTIFIC AMERICAN. The length of it is nearly 1,000 feet; about 800 feet runs through a tunnel on a grade of 6 inches to the 100 feet. Diameter of pipe 1 1/2 inch. We have three pet cocks tapped in the pipe at intervals of 150 feet in the tunnel to let out the air when we prime it. We have also an automatic air valve on the apex and a check valve in the suction end. After we started it, it would run all stream for a short time, then diminish gradually until it stopped altogether. We tried it several times with no better result. We then fastened a piece of an inch pipe on the discharge end and let it project through the side of a barrel sunk in the ground, so that there is 6 inches of water over the mouth of the pipe. It is running in a continual stream since we made the change, but it will not keep the water low enough in the mines at this rate. How can we remedy it? A. We infer from your description that the head upon the discharge opening or end is so great that, with the length of pipe and friction, the water cannot be supplied fast enough to keep your discharge opening full, probably if you use a 2 inch pipe and put to it a 1 1/2 in. discharge nozzle you will accomplish your object. 2. The pipe runs from the mouth of the tunnel down a slope on a grade of about 30 degrees; at the bottom the pipe discharges horizontally. Will it work any better by running the pipe on a trestle the same grade as in tunnel, that is, 6 inches to 100 feet, until it will be over the present discharging point, then run the pipe down near the ground so the discharge end will be perpendicular? A. We do not think this proposed change will benefit your present arrangement.

(22) C. T. M. writes: Some time ago, Vol. 37 p. 123 (17), you described a method of making vinegar. Will you please answer the following questions in the SCIENTIFIC AMERICAN? 1. If I use a vinegar barrel as a generator, how far apart should the holes in which the pack thread is inserted be? A. From 2 to 3 inches. 2. How many and what size glass air vents should be placed in the shelf? A. Use 8 3/4-inch tubes. 3. What sized air holes should those near the bottom be? A. From 1/2 to 1 inch. 4. How much of each of alcohol, water, and honey, are used for the mixture? A. 1 part 80 per cent alcohol, 4 to 6 parts of water, and 1-1000 of honey. 5. Please give a recipe for making a self shining liquid shoe polish? A. Soft water, 1 gallon; extract of logwood, 6 oz.; dissolve by aid of heat. Soft water, 1 gallon; borax, 6 oz.; shellac, 1 1/2 oz.; boil, stir, and add bichromate of potash, 3/4 oz., dissolved in 1/2 pint of water. Mix all together, warm, and add ammonia water, 3 oz. 6. Please give directions for making a galvanic battery, with directions for plating insects, etc., with gold, silver, etc. A. See p. 91 (10), Vol. 41, and pp. 47, 248, 341, and 380 (39), Vol. 35, SCIENTIFIC AMERICAN.

(23) J. A. C. asks (1) what will remove coal oil from a wool carpet without taking up the carpet. A. Moisten the spot with benzole, cover it with a piece of dry flannel, and pass a hot iron over it. Repeat with clean flannel if necessary. 2. How can I calculate the horse power of a stream, the cross section of stream and velocity being given, also head? Please state rule plainly as possible. A. It will depend upon the quantity of water you deliver at the outlet, and as this will determine the amount of head lost by friction, it becomes an important element in determining the available power. If there is no waste at the outlet, the head there would be equal to 22 feet, but it is evident that the more rapidly the water is drawn at the outlets, the greater must be the difference of head there and at the source, to overcome the friction through the pipe.

(24) J. H. M. asks if there can be made a steel blade or chisel one eighth of an inch thick driven by a wheel and crank which will penetrate a bar of iron without breaking. A. If we understand your query, yes; a power punch is an example.