

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.

Safety Boilers. See Harrison Boiler Works adv., p. 252. Gould & Eberhardt's Machinists' Tools. See adv., p. 252.

Wanted—Patents and Specialties to sell. Special advantages offered. S. M. Thompson, Providence, R. I. Van Bell's "Rye and Rock" has cured more colds and coughs than all other remedies.

Ladies who would combine beauty and comfort in dressing the feet, should use the German Corn Remover.

Fine Taps and Dies in Cases for Jewelers, Dentists, Amateurs. The Pratt & Whitney Co., Hartford, Conn.

Inventors sending a three cent stamp to Inventors' Institute, Cooper Union, New York city, will receive a copy of the Industrial News free.

There is no Cider Press now in use that produces such satisfactory results as Messrs. Boomer & Beschert's. It is built on scientific principles, and is indorsed by every one who has examined them. New York Office, 15 Park Row.

Capital wanted to manufacture a high speed, first-class Automatic Cut-off Engine. Patented, and indorsed by the highest mechanical authority. Address P. O. Box 1012, Batavia, N. Y.

Situation wanted in a manufacturing or business house by a young man of 22; good address and some business experience. References the very best. Address Lock Box 885, Providence, R. I.

Avoid the expense and evils attending the use of compounds in your boiler. Remove the sediment contained in feed water at small cost by Hotchkiss' Mechanical Boiler Cleaner. Circulars free. 84 John St., New York.

Good Machinists and Vice Hands wanted. Address Watertown Steam Engine Company, Watertown, N. Y.

Sufferers from corns will find sure relief in German Corn Remover. Sold by all druggists. 25 cts.

Rock Drill, with Hose and Portable Boiler. Machinery Exchange, 261 N. 3d St., Philadelphia, Pa.

Engines and Boilers: 16 x 48, 15 x 30, 13 x 30 inch Horizontal; 16 x 28 Upright Engines; 30, 40, and 60 H. P. Locomotive Boilers; 20 to 45 H. P. Horizontal Tubular Boilers. Second-hand, but guaranteed in good order. Full line second-hand Wood-working Machinery. Send for descriptive list. Belcher and Bagnall, 40 Cortland St., N. Y.

The Eureka Mower cuts a six foot swath easier than a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa.

Eclipse Fan Blower and Exhauster. See adv., p. 250.

The Newell Universal Mill Co., Office 7 Cortland St., New York, are manufacturers of the Newell Universal Grinder for crushing ores and grinding phosphates, bone, plaster, dyewoods, and all gummy and sticky substances. Circulars and prices forwarded upon request.

Blake "Lion and Eagle" Imp'd Crusher. See p. 221.

Ten Double-acting Presses, 8 single-acting Presses, 127 Foot Presses, for sale by The George Place Machinery Agency, 121 Chambers St., N. Y.

L. Martin & Co., manufacturers of Lampblack and Pulp Mortar-black, 236 Walnut St., Philadelphia, Pa.

Send to John D. Leveridge, 3 Cortland St., New York, for illustrated catalogue, mailed free, of all kinds of Scroll Saws and Supplies, Electric Lighters, Tyson's Steam Engines, Telephones, Novelties, etc.

Pure Oak Leather Belting. C. W. Army & Son, Manufacturers, Philadelphia. Correspondence solicited.

Jenkins' Patent Valves and Packing "The Standard." Jenkins Bros., Proprietors, 11 Dey St., New York.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Wood-Working Machinery of Improved Design and Workmanship. Cordesman, Egan & Co., Cincinnati, O.

The "1880" Lace Cutter by mail for 50 cts.; discount to the trade. Sterling Elliott, 362 Dover St., Boston, Mass.

Exports in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor House, New York.

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

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

Wren's Patent Grate Bar. See adv. page 237.

Power, Foot, and Hand Presses for Metal Workers. Lowest prices. Peerless Punch & Shear Co., 52 Dey St., N. Y.

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsburg, Pa.

Best Oak Tanned Leather Belting Wm. E. Forpaugh, Jr. & Bros., 381 Jefferson St., Philadelphia, Pa.

For Light Machinists' Tools, etc., see Reed's adv., p. 221.

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

4 to 40 H. P. Steam Engines. See adv. p. 221.

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

Rollstone Mac. Co.'s Wood Working Machinery adv. p. 337.

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

For Mill Mach'y & Mill Furnishing, see illus. adv. p. 237.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 205.

Peck's Patent Drop Press. See adv., page 236.

Clark Rubber Wheels adv. See page 236.

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

Long & Allstatter Co.'s Power Punch See adv., p. 220.

Saw Mill Machinery. Stearns Mfg. Co. See p. 237.

Presses, Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Biss, Brooklyn, N. Y.

Saunders' Pipe Cutting Threading Mach. See p. 237.

For Machinists' Tools, see Whitcomb's adv., p. 237.

Wiley & Russell M'fg Co. See adv., p. 204.

The American Electric Co., Proprs Mfrs of Thompson Houston System of Electric Lighting the Arc Type. See Bentel, Margendant & Co.'s adv., page 253.

Clark & Heald Machine Co. See adv., p. 206.

For the Cheapest Process of Manufacturing Bricks, see Chambers Bros. & Co.'s adv., page 254.

Cope & Maxwell M'fg Co.'s Pump adv., page 252.

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

50,000 Sawyers wanted. Your full address for Emerson's Hand Book of Saws (free). Over 100 illustrations and pages of valuable information. How to straighten saws, etc. Emerson, Smith & Co., Beaver Falls, Pa.

Peerless Colors—For coloring mortar. French, Richards & Co., 410 Callowhill St., Philadelphia, Pa.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's adv. p. 252. See Special Bolt Forging Machine Notice, page 268.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv. p. 258.

For the manufacture of metallic shells, cups, ferrules, blanks, and any and all kinds of small press and stamped work in copper, brass, zinc, iron, or tin, address C. J. Godfrey & Son, Union City, Conn. The manufacture of small warps, notions, and novelties in the above line, a specialty. See advertisement on page 253.

Akron Rubber Works, Akron, O., Manufacturers of Mechanical Rubber Goods.

Gear Wheels for Models (list free); Models, Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Philadelphia, Pa.

For Heavy Punches, etc., see illustrated advertisement of Little & Jones, on page 253.

Comb'd Punch & Shears; Universal Lathe Chucks. Lambertville Iron Works, Lambertville, N. J. See ad. p. 253.

Reed's Sectional Covering for steam surfaces; any one can apply it; can be removed and replaced without injury. J. A. Locke, & Son, 40 Cortland St., N. Y.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co., Box 423, Pottsville, Pa. See p. 252.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blin't Machinery, Send for catalogue to Rowley & Hernance, Williamsport, Pa.

Rowland's Vertical Engine. Wearing parts of steel. Broad bearings. F. C. & A. E. Rowland, 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.

Tyson Vase Engine, small motor, 1-33 H. P.; efficient and non-explosive; price \$50. See illus. adv., page 252.

Ore Breaker, Crusher, and Pulverizer. Smaller sizes run by horse power. See p. 252. Totten & Co., Pittsburg.

Use Vacuum Oil Co.'s Lubricating Oil, Rochester, N. Y.

For Thrashing Machines, Engines, and Horse Powers, see illus. adv. of G. Westinghouse & Co., page 253.

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) G. C. asks how to restore to its original brilliancy glass or crystal ware that has been stained by sea water. A. There are two ways to accomplish this: one is to slowly heat the glassware to low redness in a muffle or seggar furnace, and then let it cool down very slowly. It requires nice manipulation, and is expensive. The other is to polish the surface of the glass all over with a piece of chamois leather loaded with finest putty powder or rouge (free from grit) moistened with water. As the discoloration is merely superficial it usually yields readily to this treatment.

(2) S. Bros. ask: 1. What quantity of lime is taken to proportion of stearine (ordinary article) to produce stearate of lime? 2. What quantity or proportion of sulphuric acid to stearate of lime to produce stearic acid (the good quality of stearine harder than the ordinary and more glossy oil)? A. About 11 per cent pure caustic lime (equal 16 per cent hydrate) and about 2 parts acid to one of lime (theory requires 1.75). 2. What acid is most suitable to combine beef fat oil with caseine in the manufacture of cheese? A. No acid is necessary. (See page 175, current volume.) 3. What machinery is used in the refining of cotton seed oil? What is the best method to make this oil perfectly tasteless? A. A deep narrow wooden tub, provided with a stirring apparatus and pipe for injecting steam, and a wooden cylinder filled with coarsely granular animal charcoal for filtering. Heat the oil to about 120° Fah., by steam injection, and add for every 100 lb. 1/2 lb. bicromate of potassium dissolved in hot water; agitate violently, and add, first, 1 lb. strong hydrochloric acid, then gradually, 1/4 lb. sulphuric acid. Continue the agitation for half an hour, then add a volume of water about equal to that of the oil; agitate for a few minutes, and let rest to separate. Draw off the water, blow steam through the oil for about 15 minutes, then pass through the bone black filter slowly.

(3) J. H. asks: 1. What will keep glue in a liquid state continually without injuring its adhesiveness? A. Heat the pure glue solution for about 12 hours in a Papin's digester at 300° Fah. The glue will remain liquid on cooling. 2. What number SCIENTIFIC AMERICAN SUPPLEMENT has recipe for liquid glue for wood? A. See SUPPLEMENT, No. 158.

(4) E. E. P. asks: How do you cut, or how do you prepare isinglass to be used as a varnish? A. Isinglass—fish glue—dissolves in hot water or in hot dilute wine spirit. Mica—sometimes improperly called isinglass—cannot be dissolved so as to be used as a varnish.

(5) S. P. Co. write: We are desirous of obtaining the recipe for japanning castings a goods of our manufacture. We have used coal tar and also asphaltum, but it does not leave the gloss and finish which we notice on Eastern castings and malleables which come to this coast. We judge there is a preparation for japanning in which they dip the castings. A. The following is a common method. The work is simply coated with good drying linseed oil and heated in an oven, at first just hot enough to turn the oil black. The heat is then gradually raised (as high as may be with it burning it), and kept up for an hour, or until the coating, when cold, is hard enough for service.

(6) F. A. R. writes: 1. In SCIENTIFIC AMERICAN SUPPLEMENT, No. 143, page 2276, an article written by Thomas Boias, Esq., F. C. S., upon "Printing Surfaces and Pictures by Photography," in the last line of second column he says: "Next I put some thick gum water on the stone," etc. Please inform me regarding the gum water he meant. All the other directions are explicit, but I have failed to find any gum to which printer's ink will not adhere. A. Use gum arabic dissolved in warm water. 2. I desire to make two gas bags to hold H and O of about 45 gallons capacity each. I wish to know if I can successfully make them out of heavy cotton cloth? A. See answer to F. M. W. (21), page 186, current volume.

(7) P. N. asks: 1. How are rubber stamps or type made? A. See "How to Make Rubber Stamps," SCIENTIFIC AMERICAN SUPPLEMENT, No. 83. 2. Why is it that melted lead will not take the form of letters taken in plaster of Paris? The lead does not seem to reach the bottom of the cast. Why is it? A. The metal chills too quickly. It is necessary to heat the mould. Try type metal instead of lead.

(8) A. H. M. asks: Is there a substitute for alcohol to be mixed with whiting to keep it from freezing instead of using clean water—something that will do to clean windows and glassware with? Alcohol is too costly and evaporates too quickly. A. The addition of a small quantity of glycerine to the water with which the whiting is mixed will keep it from freezing and will not interfere.

(9) W. G. asks for the process of removing the gloss from diagonal cloth, caused by wear. A. Brushing over with the following preparation will in some cases revive the appearance: Extract of logwood, 1 oz.; sulphate of iron, 3/4 oz.; hot water, 1 pint. Where the nap is worn off there is no permanent remedy.

(10) J. J. H. asks: What kind of flexible paint is used in making table oilcloths? A. Size with hot soap and alum solutions, used alternately. Dry and enamel with colors ground fine in oil with plenty of driers and a little turpentine. Finish with a thin copal varnish if high gloss is desired. Harden by drying at about 200° Fah.

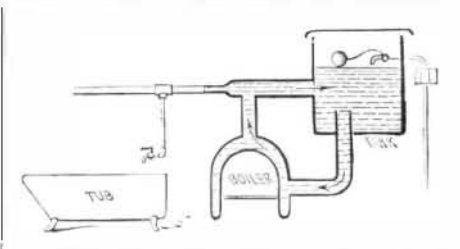
(11) F. J. W. writes: If you can give me any information concerning what follows you will much oblige me. I presume it is settled that the freezing point of water (or melting point of ice) is 32° under ordinary conditions. Since ice, however, after being formed may suffer a further loss of heat, like any other solid, it follows that ice is often cut and stored when at a much lower temperature than 32°, say, for instance, at 12°. Now, without having made any experiment, I should suppose (as ice is a good conductor of heat) that, if it had been stored for any length of time or exposed for even a short time to a temperature of 32° or above, it would abstract sufficient heat from its surroundings to raise its own temperature to about 32°. I have been told, however, that if ice is cut and stored when at a temperature of 12° that months afterward, although transported in hot weather, it would still have its original temperature of 12° instead of having risen to 32°. I do not know whether the parties themselves had made the experiment, but they claim that if a hole is bored to the center of a block it will show the original temperature of 12° no matter how hot the weather may be. As I have generally lived much further south, I have had no opportunity of experimenting, and thinking you might know something of the matter, I have ventured to apply to you. A. Ice is a poor conductor, and where the temperature prevailing at the time it was found was much below 32° Fah., the center of a large block frequently has a temperature below the freezing point even when the surface is melting. If kept at a little below 32° for some time the whole block will eventually have about the same temperature.

(12) E. N. T. asks: 1. How many cubic feet per minute of steam at 60 lb. pressure will flow from a nozzle, 1/4 inch bore and 3/4 inch long, to where it widens out to 1/2 inch diameter? A. 18.2 cubic feet per minute, at 60 lb. pressure above atmosphere. 2. How many pounds of coal per hour will be required to generate the steam used? A. Twenty-six to twenty-eight pounds.

(13) C. A. P. writes: I have some graduated paper circles cemented to iron disks. With what shall I varnish them that they may stand the weather, without making them transparent or difficult to read? A. Dissolve 1 oz. best isinglass in about a pint of water by simmering it over the fire and strain through muslin. Try the size moderately warm on a piece of paper; if it glazes it is too thick, add more water; if it soaks into the paper it is too thin, add isinglass; when of proper consistency it should merely dull the surface. Give the paper two or three coats, letting each dry, with care (particularly in the first coat), to bear very lightly on the brush, which should be a flat camel's hair from which

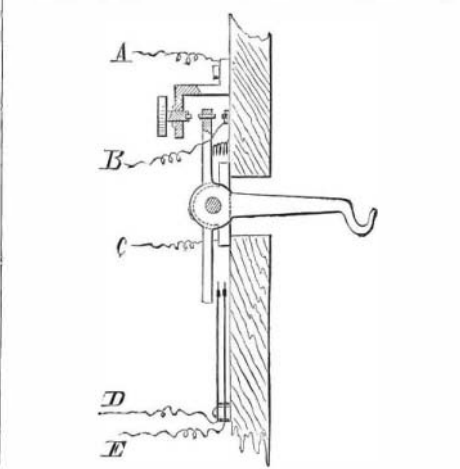
the size should flow freely. When all is dry give three coats of thin dammar varnish.

(14) W. H. M. asks how to supply hot water to a bath house. A. Probably the cheapest and best way to furnish hot water for a bath house, cost of plant and maintenance considered, is to set up a small cast iron boiler (saddle or any other good hot water apparatus boiler) and connect the same with an open tank, the latter to be at least large enough to contain four times the water that can be used at one time in all the tubs. The tank should be furnished with a water connection and ball cock to keep the same level of water always. The height and diameter of the tank should be about the same; wood will do, iron is better. The following diagram shows the connections and their po-



sitions. A boiler connected this way will not fill with lime or magnesia soon; it will be found in the bottom of the tank.

(15) J. H. S. writes: The sketch shows a commutator which can be applied to such a telephone as was recently described in the SCIENTIFIC AMERICAN.



A, to line through secondary and receiver. B, to line through bell magnet and signal key. C, to ground. D, to battery. E, to battery through primary of induction coil and transmitter.

I have used it more than a year in my house and it works very satisfactorily. It will be noticed that it is automatic to open as well as to close the telephone and bell circuits, and also operates the local battery circuit. The weight of the receiving telephone when suspended from the hook makes contact with the anvil and closes circuit from line through bell to ground, and the instrument is in a position to receive a call. In this circuit and outside of the bell is placed an ordinary spring key having top and bottom contact, by depressing which the current of the call battery is sent into-line and operates the bell at other station where a similar instrument is placed. When the receiver is taken from its hook the small coiled spring causes the instrument to release the anvil contact, thus cutting out the bell, and through the top contact, puts into line the receiver and secondary. The lower arm of the lever presses the two light springs together and closes circuit of local battery through transmitter (microphone) and primary. These springs should be very thin, so as to give less resistance to the movement of the hook than the coiled spring, otherwise they might prevent a proper contact of the upper arm of the lever.

(16) O. L. C. asks: 1. Would two Daniell's batteries be sufficient to ring a bell on a circuit of 250 yards, the bell being that distance from the batteries? A. Yes. 2. If by using the city water pipes as another return wire, would the bell ring equally as well so as to enable me to ring from either end, and leave the batteries at one end of the line? A. Yes. 3. In making a telephone does it make any difference which pole of the bar magnet the spool is on, or what direction it is wound on the spool? A. No.

(17) W. P. M. asks: Can you tell me how to prepare a cheap colorless varnish for iron pans, such as bread pans? A. Wine spirit, 1 qt.; pale shellac, 2 1/2 oz.; digest and agitate until dissolved and strain through a fine cloth. Warm the clean article and apply quickly and evenly with a soft brush. Varnish of any kind should not be used on the inside of culinary vessels. A trace of oil will usually keep the metal clean under ordinary circumstances.

(18) P. J. writes: I wish to establish telegraphic communication between two points separated by a body of water of 200 feet in width. Only signals, produced on electric bells at each end of the line are to be used. What I wish to know is this: 1. Will the wire used to connect stations have to be insulated? A. Yes, they will be submerged. 2. If insulation is necessary, what is the best wire to use? Would like it as small in diameter as possible. A. Kerite or gutta percha insulated. No. 18 copper wire will answer. 3. Will there have to be two lines of wire, or is one sufficient? A. With a good ground one wire is sufficient. 4. Will there have to be a battery at each end of the line? A. For open circuit, yes. For a closed circuit you may use a battery at one end of the line. 5. Is there any form of small and compact electric generator of any kind which could be used at one of the stations instead of a battery? A. There are magneto-electric calls in market which take the place of batteries.

(19) J. A. W. writes: 1. I wish to construct a small sectional boiler for an engine 3x6; please inform me whether common gas pipe is suitable for the