

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 Musical Marvel.—Read the advertisement of the wonderful automatic instrument "Organina," which plays every tune with almost human expression and effect. This is the greatest musical marvel of the age. Indorsed by the m'f'rs of the Chickering pianos and by the best of musicians everywhere. It is the most beautiful and acceptable gift of the season. Order one from the manufacturers or their agents.

Hotchkiss' Mechanical Boiler Cleaner, 84 John St., N.Y., will save your water tax by using well water, hard and limy, even the worst. Engineers make ten per cent selling other parties than employers. Circular free.

Hartshorn's Self-Acting Shade Rollers, 486 Broadway, New York. No cords or balances. Do not get out of order. A great convenience. Sold everywhere by the trade. See that you get Hartshorn's rollers. Manufacturers and dealers in infringing rollers held strictly responsible.

The undersigned, patentee of a new, simple, and effective Water Motor, by which the smallest streams of water may be utilized for motive power, wishes to arrange with parties having suitable facilities to manufacture and introduce the invention. Wm. Lay, Seneca City, S. C.

A trustworthy man of large experience in chemistry and machinery advertises on another page of this paper for a situation. To any manufacturing concern desiring a competent and first-class man for a place of trust, the publishers of this paper have no hesitation in recommending the advertiser. Address A. B. care President of the Third National Bank, New York city.

The surprising results in saving of fuel by the use of Asbestos Steam Pipe and Boiler Coverings are worthy the attention of every one using steam. The genuine are manufactured only by the H. W. Johns Manufacturing Company, 87 Maiden Lane, New York, patentees and sole manufacturers of Asbestos Paints, Roofing, etc.

A Well's Patent Fast Running 10 H. P. Engine, nearly new, first-class order. John Lahan, 13 Barclay St. N. Y.

The Esterbrook Steel Pen Co. make over 150 varieties of steel pens, and are constantly adding new designs.

Wanted—Steam Engine and Peanut Roaster. F. N. Lang, Baraboo, Wis.

L. Martin & Co., manufacturers of Lampblack and Pulp Mortar-black, 226 Walnut St., Philadelphia, Pa.

Kerosene Stove Wick Trimmer. See illus. article, p. 70, current vol., S. A. Walker & Williams, Sing Sing, N. Y.

Foot Power Machinery for use in Workshops; sent on trial if desired. W. F. & Jno. Barnes, Rockford, Ill.

Large Slotter, 72" x 18" stroke. Photo on application. Machinery Exchange, 261 N. 3d St., Phila.

Burgess' Portable Mechan. Blowpipe. See adv., p. 76.

Steam Engines; Eclipse Safety Sectional Boiler. Lambertville Iron Works, Lambertville, N. J. See ad. p. 60.

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

Books for Engineers and Mechanics. Catalogues free. E. & P. N. Spon, 446 Broome St., New York.

Driving Clocks for Equatorial Telescopes. Address Th. Fischlein, 158 Pavonia Ave., Jersey City, N. J.

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.

Saunders' Pipe Cutting and Threading Machines. See adv., p. 45.

Abbe Bolt Forging Machines and Palmer Power Hammer a specialty. Forsaith & Co., Manchester, N. H.

List 25.—Descriptive of over 2,000 new and second-hand machines, now ready for distribution. Send stamp for same. Forsaith & Co., Manchester, N. H.

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

Two Patents for sale. R. Munroe, Fitchburg, Mass.

Within the last ten years greater improvements have been made in mowing machines than any other agricultural implement. It is universally acknowledged that the Eureka Mower Co., of Towanda, Pa., are making the best mower now in use, and every farmer should write to the manufacturers for catalogue, with prices.

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

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

Superior Malleable Castings at moderate rates of Richard P. Pim, Wilmington, Del.

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, 262 Dover St., Boston, Mass.

The Tools, Fixtures, and Patterns of the Taunton Foundry and Machine Company for sale, by the George Place Machinery Agency, 121 Chambers St., New York.

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

Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole m'f'rs., H. Lloyd, Son & Co., Pittsburg, Pa. Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

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

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

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

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

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

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

Downer's Cleaning and Polishing Oil for bright metals, is the oldest and best in the market. Highly recommended by the New York, Boston, and other Fire Departments throughout the country. For quickness of cleaning and luster produced it has no equal. Sample five gallon can sent C. O. D. for \$3. A. H. Downer, 17 peck Slip, New York.

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

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, B'klyn, N. Y.

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

National Institute of Steam and Mechanical Engineering, Bridgeport, Conn. Blast Furnace Construction and Management. The metallurgy of iron and steel. Practical Instruction in Steam Engineering, and a good situation when competent. Send for pamphlet.

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.

Clark Rubber Wheels adv. See page 29.

Peck's Patent Drop Press. See adv., page 45.

For Pat. Safety Elevators, Hoisting Engines, Friction Clutch Pulleys, Cut-off Coupling, see Frisbie's ad. p. 60. For Separators, Farm & Vertical Engines, see adv. p. 61.

Blake "Lion and Eagle" Imp'd Crusher. See p. 45.

Mineral Lands Prospected, Artesian Wells Bored, by Pa. Diamond Drill Co. Box 423, Potsville, Pa. See p. 60.

Wren's Patent Grate Bar. See adv. page 45.

For Patent Shapers and Planers, see illus. adv. p. 60.

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

Apply to J. H. Blaisdell for all kinds of Wood and Iron Working Machinery. 107 Liberty St., New York. Send for illustrated catalogue.

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. 76.

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

The I. B. Davis Patent Feed Pump. See adv., p. 76.

For Superior Steam Heat. Appar., see adv., page 77.

Eagle Anvils, 10 cents per pound. Fully warranted.

Steam Cylinders bored from 3 to 110 inches. L. B. Flanders Machine Works, Philadelphia, Pa.

Machinists' Tools and Special Mach'y. See adv., p. 76.

Houston's Sash Dovetailing Machine. See ad., p. 77.

H. A. Lee's Moulding Machines, Worcester, Mass.

New Economizer Portable Engine. See illus. adv. p. 76.

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, 73 Broadway, New York.

Moulding Machines for Foundry Use. 33 per cent saved in labor. See adv. of Reynolds & Co., page 76.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 77.

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

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

Saw Mill Machinery. Stearns Mfg. Co. See p. 77.

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

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

Toope's Pat. Felt and Asbestos Non-conducting Removable Covering for Hot or Cold Surfaces; Toope's Pat. Grate Bar. Chas. Toope, M'fg Agt., 353 E. 78th St., N. Y.

The Sweetland Chuck. See illus. adv., p. 76.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Solomon's Parallel Vise, Taylor, Stiles & Co., Riegelsville, N. J. Green River Drilling Machines. See ad. p. 60.



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) J. R. asks how to mix aniline colors so that they will hold on glass buttons without rubbing off by touching. A. Mix them with a thin colorless varnish (alcoholic), such as bleached shellac or spirit copal.

(2) C. E. N. asks how to soften rattan so as to make neat basket work. A. Coil and steep in boiling water for a time.

(3) C. H. A. asks: Are kerosene heaters unhealthy? A. As commonly used, without means of carrying off the products of combustion, yes.

(4) J. B. asks how to make soap hard and firm. A. Heat the paste nearly to boiling, add plenty of soap, skim off the curd soap which separates, press and let stand to cool. Then cut up and stack in a dry place to harden.

(5) W. B. H. asks if the same cutter is used to cut all the wheels in a set of change wheels for a lathe. I have a lathe, and wish to cut some more wheels, have an index plate and gear cutter, but don't know whether a cutter made from one of the wheels as a pattern would answer for others having more or less teeth. A. Yes, if you shape your cutter to the teeth of a wheel not differing much from the diameter of that you wish to cut. 2. Please give me the title of some good work on amateur mechanics, or some work where I can get some information relative to gear cutting, etc. A. "Shelly's Workshop Appliances."

(6) H. S. asks the cause of the noise in the pipe connecting the range and boiler. The noise is something like that of a steam pump. The pipe connecting my range and boiler has burst twice in as many months, and the plumbers say they cannot account for it, and, therefore, cannot remedy it. The boiler is about 40 gallons just where the noise is, and the noise does not commence until the water becomes heated. A. The pipe when it leaves the water back must rise gradually and have no place for steam to gather in. Anything which retards the free circulation of the water will cause noise, whether there is a partial stoppage in the pipe or whether the pipes are not properly set. It is excessive heat, with alternate heating and cooling at that part of the pipe, assisted by the ordinary pressure, which causes it to burst.

(7) A. W. asks: 1. Is there a common way of melting German silver? A. Use a black lead crucible, cover with charcoal, and give a good white heat in a small crucible or melting furnace. 2. How can I harden small gages? A. Heat to bright redness under charcoal and quench in clean water, draw to a purple color. 3. Can you tell me of a way by which I can clean files, such as used by manufacturers of metal show cases; they get filled with soft solder? A. Use a piece of sheet brass or soft hoop iron to detach the metal between the teeth by striking across the file in the direction of the teeth.

(8) C. G. R. asks: 1. At what speed is the boat described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 166, supposed to run with a load. A. Probably eight to eight and a half miles. 2. What wood is best for ribs and keel, and is it bent or sawed into shape? A. White oak; best bent. 3. What wood is best for the hull and how thick? A. Cedar or cypress, five-eighths inch or three-fourths inch thick. 4. Would a four horse power engine answer for this boat? A. Probably it would if the stroke is not too great.

(9) M. J. H. asks for a cheap receipt or process for removing the color from calico prints and colored cotton cloth and bleaching it white. A. Boil in a strong solution of caustic soda, rinse thoroughly in clean water; steep for half an hour in a strong clear solution of chloride of lime (calcium hypochlorite) in water; ring out and pass through water containing about 3 per cent of sulphuric acid, rinse in running water until all traces of the bleaching materials are removed; dry.

(10) W. C. K. asks: What will remove tattoo marks from the skin? A. It is said that milk pricked into the skin in the same way that ink was originally applied will change the blue color to red and ultimately cause it to disappear.

(11) J. B. D. asks how to make a solution that will take thick grease from steel wire so that it can be immediately dried, without causing it to rust? A. Use a boiling hot solution of potash in water. Bisulphide of carbon and naphtha also readily dissolve grease or oil without rusting.

(12) R. E. N. writes: We have two valuable sleigh robes, which are not used very often; how can I keep them free from moths when not in use? A. Alcohol, 1 pint; camphor, half an ounce; dissolve. Spray with this liquid before storing.

(13) W. T. B. asks (1) how oil of neroli is made. A. The freshly gathered flowers (sweet orange) distilled with an equal quantity of soft water in a retort provided with a condenser. The oil separates from the distilled water, which is returned to the still with fresh leaves. Rectify by redistillation. About 600 pounds of the flowers produce 1 ounce of the oil. 2. How are orange flowers gathered and preserved? A. The flowers cannot be preserved without loss.

(14) C. asks: Can you give me test for grease in glue? A. Macerate the glue with a little pure bisulphide of carbon, draw off the latter, filter quickly, and let it evaporate, in a clean porcelain vessel. The oil or grease (if any) in the glue tested will remain as a residue.

(15) J. S. B. asks why it is that the salts in a storm glass rise to the top of the hermetically sealed glass tube in damp weather, and sink to the bottom in dry weather. A. These glasses are usually not hermetically sealed—the change is chiefly due to the effects of the varying temperature.

(16) F. M. W. asks: What is the method of preparing and using soluble glass in the place of resin, in the manufacture of hard and soft soaps? A. Pure quartz sand, 1 lb.; reduce by grinding to a fine powder, and intimately mix with 1½ lb. carbonate of soda deprived of water by calcination. Place the mixture in a retort, capable of holding four times the quantity, and expose to a white heat until the mixture is in a state of calm fusion. Pour out on an iron plate to cool. When powdered it dissolves to a sirupy liquid in boiling water. Consult Feuchtwanger's "Soluble Glass" and Dussauce's "A Treatise on the Manufacture of Soap."

(17) L. G. G. asks: 1. What gas is the lightest? A. Hydrogen. An equal volume of atmospheric air under like conditions of temperature and pressure weigh about fourteen and a half times as much. 2. How much lifting power has it per 1,000 cubic feet? A. If pure, about 109 pounds. 3. How is it made? A. On a large scale usually by decomposing dilute oil of vitriol with scrap iron, or by decomposing superheated steam by passing it over red hot iron. See Giffard's process (illustrated), p. 104, Vol. 38, SCIENTIFIC AMERICAN. 4. If kept in an air-tight vessel will it always remain the same under all conditions of weather? A. If pure, yes.

(18) J. S. asks whether there is any process besides painting, of transferring a photograph on glass for the purpose of showing it in a magic lantern. A. The process of obtaining photographic lantern transparencies is briefly as follows: Clean the glass, coat it with a thin ammoniacal solution of albumen, dry, flow with photographer's sensitized collodion, dip for a few moments in a bath of nitrate of silver, 5 drachms; distilled water, 10 fluid ounces (in a dark room). Adjust the photograph to be copied before the camera and focus. Then put the sensitized glass plate in the dark box, transfer to the camera, expose a minute or two (according to light), then cover, immediately remove to the dark closet and wash the plate in a strong solution of sulphate of iron to develop the picture. Tone in a little warm water containing a few drops of gold chloride, wash and fix by immersion in a strong aqueous solution of hyposulphite of soda or cyanide of potassium, rinse thoroughly dry, and flow with photographer's varnish. Place this in the outer aperture of a dark tube, the other end of which joins the front of the camera, so that the light passing through it enters the lenses of the camera and the image may be focused on the glass plate at the back. Then prepare another sensitized glass plate as before, expose in the camera, develop, tone, and fix as before. This plate will bear a positive image, and may be used directly in the lantern. Consult any good photographer.

(19) J. M. R. asks: By what means can I restore to its original whiteness a plaster vase that has become yellow? It appears to be a mixture of plaster of Paris and oil or wax of some kind, the outside being coated with spermaceti or paraffine. A. While chlorine or peroxide of hydrogen might be tried, we believe that there is no known method of restoring the original purity of a plaster article prepared as indicated. The easiest and most effective manner will be to paint it with a white paint possessing good body, such as Dutch white lead.

(20) E. B. F. asks: Can you give a description of the blue photographic process of copying tracings, etc., used by architects and others? The process is that by which white lines on a dark blue or purple ground are obtained. A. To compress a full description in the small space at disposal in this column would be impossible, but we give hints from which you can work. Brush the paper over with a solution of ferric-oxalate, ten grains to the ounce. This paper will remain good for years, but must be kept carefully in the dark. Expose to light under the drawing that is to be copied, and then brush it over with or immerse it in a solution of ferridcyanide of potassium (red prussiate of potash), by which the picture will be immediately developed, white lines upon a blue ground. The strength of the developing solution is immaterial. The blue color becomes intensified by subsequent washing with a solution of bisulphate of potash. The best sensitizing preparations are those in which ammonia as well as oxalic acid forms a part. Such ammonio-ferric oxalate may be prepared by mixing together oxalate of ammonia, 437 grains; oxalic acid, 386 grains; water, 6 ounces; heating the mixture to the boiling point and then stirring in as much hydrated peroxide of iron as it will dissolve. Peroxalate of iron alone is simply prepared by adding peroxide of iron to a hot solution of oxalic acid in water to saturation.

(21) S. A. C. asks how the iron moulds for cast steel ingots are made. Do they separate at the corners or in the middle of the mould to allow the ingot to be got out? A. The moulds are in a single piece. The cavity into which the metal is poured is made slightly tapering to admit of lifting the mould from the ingot.

(22) G. K. writes: I have a lot of keys that have got badly rusted through lying by for some time. Will you please inform me how to clean the rust off? A. Scour with a little fine emery and oil, if iron; if brass boil in strong washing soda solution, rinse in water, then dip momentarily in strong nitric acid, rinse quickly, rub with a cloth or sawdust and slightly oil.

(23) J. P. B. asks for a recipe for making a cheap black paint for coating canvas. The paint must not crack, and have a good gloss. A. Try the following: Gumamber, 16 oz.; melt in boiling oil (linseed), half a pint; add genuine asphaltum and resin, each 3 oz. Mix thoroughly over the fire, remove to the open air, and gradually add 1 pint of oil of turpentine, slightly warm.

(24) E. T. W. asks: What is used and how prepared and applied for a dressing for carriage tops when they become worn? I have seen one that had been dressed over and it looked as well as new. A. See answer to J. P. B., this page.

(25) J. N. S. asks: How many pounds of iron turning, of vitriol, and of water will it require to make eight thousand cubic feet of hydrogen gas? Can I make it in one vessel or tank, and what size, or will it operate better by using two or more smaller vessels, and of what size? A. About 1,176 lb. iron turnings, 374 gallons strong oil of vitriol, and 45 barrels of water. Better use a number of large, tight hogheads. Make connection by means of varnished canvas hose, with a short piece of iron pipe driven in a hole in the head of the vessel; 7 lb. iron require at least 12½ lb. acid mixed with about 6 gallons of water. See Giffard's apparatus and process for making hydrogen for inflating balloons, p. 104, Vol. 38, SCIENTIFIC AMERICAN.

(26) J. F. writes: I have in my possession a graduated tube with a bulb on the end loaded with shot; it is marked "Baume for coal oil," temperature 60° Fah. I wish to know how to use it so as to tell the best oil and which is the least explosive. It is marked from 10 up to 75. I have never seen these instruments described by you. A. In Baume's hydrometer for light liquids zero (0°) indicates a specific gravity of 1.075; 10° corresponds to sp. gr. 1.000; 25° to sp. gr. 0.906; 50° to sp. gr. 0.782, and so on. Suspend the instrument in astral oil, which will serve as a good standard; those in which the instrument sinks deeper are of poorer quality. Almost any dealer in optical and philosophical apparatus can provide you with printed tables and explanations of the instrument.

(27) D. V. C. asks if there is any ingredients which would mix with our sizing, composed principally of glue and soap dissolved in water, to prevent