

Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion. If the Notice exceeds four lines, One Dollar and a Half per line will be charged.

Patent of Churn for sale. Also wanted a partner to patent it in foreign countries. Address G. W. Knapp, Arbuckle, Mason Co., W. Va.

Improved Put Friction Twisting Engines of any power and style. J. S. Mundy, Newark, N. J.

Will give \$300 for Steam Launch. Whitfield, Bay St. Louis, Miss.

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

Improved Spoke and Hub Machinery manufactured by Colborne Bros., Menasha, Wis.

A new deposit of Plumbago or Graphite, said to be the finest in this country, is now being worked at Uwchland, Chester County, Penn.; both granular and flake are worked to perfection. The Eagle Plumbago Co., at Uwchland, Chester County, will give all information on application.

Book Binders' Case Binding Machine. Send for illustrated circular. Frank Thomas & Co., Cincinnati, Ohio.

Help for the weak, nervous, and debilitated. Chronic and painful diseases cured without medicine. Pulvermacher's Electric Belts are the desideratum. Book, with full particulars, mailed free. Address Pulvermacher Galvanic Co., 292 Vine St., Cincinnati, Ohio.

For Sale.—6 ft. Planer, \$275; 33" Lathe, \$300; 16" Lathe, \$175; 20" Lathe, \$250; at Shearman's, 132 N. 3d St., Philadelphia, Pa.

Silver Solder and small Tubing. John Holland, Cincinnati, Manufacturer of Gold Pens and Pencil Cases.

Steam Yachts for sale, new, 14 feet long, 4 feet beam, 1/2 h. p., \$250; 18 feet long, 4 1/2 feet beam, 1 h. p., \$355; 21 feet long, 5 1/2 feet beam, 2 h. p., \$425. Shipping weights 450, 800, and 1,200 lbs. Will carry comfortably 4, 8, and 12 persons. Send for particulars. S. C. Forsaith & Co., Manchester, N. H.

For sale cheap—Two valuable Patents (Household Articles). Address J. A. Worley, Cleveland, O.

Amateur Photographic Apparatus, Chemicals, etc. Outfits, \$5 to \$25. Säckmann & Co., manufs., 278 Pearl St., N. Y.

Persons wishing to have any new article invented, address John Meyer, 717 Craig St., Covington, Ky., inventor of over 500 inventions of all kinds. Permutation and Time Locks a specialty.

Patent Right for sale, either by State rights or the whole of the U. S. and Canada; new invention; a Saw Mill Dog. For further particulars, apply to Alfred Meppam, Fayette, Fulton Co., Ohio.

Parties having Room and Power, favorable located, and would like to assist in establishing a profitable Manufacturing business in the Hardware line, are requested to address for particulars, P. O. Box 451, Athol, Mass.

How to make Violins. Write to J. Ranger, Syracuse, N. Y.

Platform Clothes Wringer, Centennial Prize Medal Awarded for being "perfectly self-regulating, and well fitted for the purpose intended." License to manufacture granted. J. K. Dugdale, Richmond, Ind.

Glass Cylinders Tempered in Oil. T. Degnan, 129 Milk St., Boston, Mass.

600 New and Second-hand Portable and Stationary Engines and Boilers, Saw Mills, Wood Working Machines, Grist Mills, Lathes, Planers, Machine Tools, Yachts and Yacht Engines, Water Wheels, Steam Pumps, etc., etc., fully described in our No. 11 list, with prices annexed. Send stamp for copy, stating fully just what is wanted. Forsaith & Co., Machine dealers, Manchester, N. H.

Gas lighting by Electricity, applied to public and private buildings. For the best system, address A. L. Bort, 702 Broadway, N. Y.

Power & Foot Presses, Ferracute Co., Bridgeton, N. J.

Superior Lace Leather, all sizes, cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Army, 148 North 3d St., Philadelphia, Pa.

For Best Presses, Dies, and Fruit Can Tools, Bliss & Williams, cor. of Plymouth and Jay Sts., Brooklyn, N. Y.

Lead Pipe, Sheet Lead, Bar Lead, and Gas Pipe. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

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

Steel Castings from one lb. to five thousand lbs. Invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

For Solid Wrought Iron Beams, etc., see advertisement. Address Union Iron Mills, Pittsburgh, Pa., for lithograph, etc.

Shingle Heading, and Stave Machine. See advertisement of Trevor & Co., Lockport, N. Y.

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

The Zero Refrigerator was awarded a grand Centennial medal. Send for book. Lesley, 226 W. 23d St., N. Y.

Etterich's Screw Cutting Tools are in great demand. Catalogue free. Frasse & Co., 62 Chatham St., N. Y.

Patent Scroll and Band Saws. Best and cheapest in use. Cordesman, Egan & Co., Cincinnati, O.

Best Glass Oilers. Cody & Ruthven, Cincinnati, O.



J. S. will find directions for making lard oil on p. 253, vol. 30.—H. C. W. should read our articles on the management of boilers on p. 293, vol. 36. As to testing boilers, see p. 246, vol. 34.—W. E. can plate brass, etc., with nickel by the process described on p. 235, vol. 33.—O. E. will find directions for making oil of peppermint on p. 219, vol. 31.—E. O. T. will find an excellent recipe for cement for mending roofs on p. 187, vol. 35.—J. B. will find a recipe for tough glue on p. 43, vol. 32.—D. A. G. will find directions for making impression paper on p. 378, vol. 28.—T. S. L. can remove paint spots

from glass by following the directions on p. 235, vol. 36.—J. T. S. will find a description of the Gatling gun on p. 143, vol. 26.—A. C. will find a description of an hydraulic press on p. 315, vol. 35.—A. H. D. will find a description of the nitrate of silver process of making mirrors on p. 267, vol. 31.—D. S. M. will find directions for kalsomining on p. 351, vol. 24.—P. A. N. does not send sufficient data.—R. F. I. will find directions for building an ice house on p. 251, vol. 31.—E. B., C. F. Q., J. W. B. N. C., G. P., R. K. B., J. F. P., W. H., J. P., and others, who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of whom are trustworthy firms, for catalogues.

(1) O. C. K., of Leipsic, Germany, says: To make lead pipes nearly harmless, as regards the poisonous properties of the lead salts soluble in water, fill the pipes for a short time with dilute sulphuric acid (SO₄H₂+10 or 20 H₂O). The pipes will become covered with a thin coating of sulphate of lead (SO₄Pb), which is far more insoluble in water than the oxyhydrate of lead (Pb OH₂) generally formed.

(2) A. G. says: I have a rough chamois skin leather bag, into which, by some mistake or other, there came some English vermilion, dry. How could I clean it out? A. Vermilion is a compound of mercury with sulphur, and there is no solvent for it that would not damage the materials of the bag. Remove as much of it as you can with a stiff brush, and then cause an energetic stream of water to impinge upon the discolored surface, so as to mechanically carry off the particles of the pigment.

(3) G. B. S. asks: 1. Will tin (old cans, etc.), copperplated, do for the coppers in a gravity battery? A. Yes. 2. Will salt (sodium chloride) do for the saline substance? A. Better use sulphate of zinc. 3. Will common plate (window) glass do for the plate in an electric machine? A. Yes, but it is not the very best.

(4) W. M. M. says: I have a magic lantern, and want to know what kind of oil gives the best light for it. A. Kerosene gives as good a light as any, and better than most others.

(5) C. M. asks: What can be applied as a depilatory on horses, destroying the pigmentary granules yet not destroying the life of the hair? The object in view is to brand colored horses with a white brand. A. This is not practicable. The color of the hair above the cuticle may be bleached by the application of chlorine water or nitro-muriatic acid (*agua regia*). It is not probable, however, that the action of these will be rapid enough for your purpose.

(6) C. E. H. says: Four years ago I had in a mill an upright shaft of eight inches diameter which, with attached gearing, weighed several thousand pounds. The toe on which it turned commenced cutting badly. It was impossible to remove the toe. Washers of steel raised the shaft too high out of the step, wore out rapidly, and did not work thoroughly well. I went to a number of machine shops for advice. One told me to grind it out with emery; another said my only course was to take down the shaft and send it by rail to the shop, and none could give me any speedy and economical cure for the trouble. At length I met the right man, who told me to raise the shaft and put under the toe (in the step) an old-fashioned large-sized copper cent. This I did, and the heating and cutting ceased at once, and the difficulty was permanently overcome. Since then I have put small cents in the steps of millstone spindles and always with good effect. The grooves filled up with the copper, and the toe looked as though it were copperplated and burnished. I even got to introducing a small copper cent under each new spindle, and think that so doing prevented cutting.

(7) A. J. F. asks: How can I set the lenses of an eyepiece to a telescope? It is composed of two plano-convex lenses. A. The Huyghenian eye lens is one third the focus of the field lens, and is placed its own focal length with the focus of the latter.

(8) A. L. S. says: I learn from tables on the heat of water with steam, that 60 lbs. pressure equals 292° F. Is this the degree of heat under any and all circumstances? A. This is for fresh water. The temperature changes, if the water contains impurities.

(9) G. W. K. says: I have tan vats which have not been used for some time. I keep them full of water to preserve them. How shall I keep mosquitoes from breeding in them? A. Cover them tightly.

(10) E. C. H. says: I wish to fill up a low place in a lot with a mixture of sand and gravel. How much will it settle after leveling it off 1 foot deep with no packing? Surface of plot is a rich loam, subsoil a clay bottom. A. From 1/4 to 1/2.

What is the thinnest circular saw I can use 10 inches in diameter for sawing 2 inch white oak, saw running on 700 revolutions per minute with 2 horse power? A. One of No. 16 gauge, or about 1/16 of an inch thick.

(11) I. says: Nearly all lugs or supports riveted to steam boilers have three on each side, one of them in the middle of the boiler; so, if either end of the support settles, the whole weight of the boiler of water is hung by the middle. This is all wrong. There should be either two or four supports on each side of the boiler, the longest space between the two inside ones. Is not this so? A. Yes. We could not tell you why the former course is pursued, except that common sense is scarce.

Why is it that persons at this period of mechanical science place tightening pulleys on the load line or pulling side of a belt? A. We do not know, but we are glad to call attention to these points again, as we have frequently done before.

(12) G. H. A. says: I sometimes preserve eggs in limewater, and they keep well, but look lumpy after taking out of the solution, notwithstanding that I let the lime settle in the water till it looks clear, and dip it out, leaving the lime behind. Is there anything that I can put in to remove what little lime stays in the water? A. We think filtering will answer the purpose. Place a piece of filtering paper in a funnel, and pour in the liquid.

(13) C. S. O. asks: 1. Has the compound engine any advantage or economy other than shortness

of stroke over a single cylinder sufficiently long to secure an equal amount of expansion? A. It is claimed that the machinery can be made lighter, with the compound engine, for high grades of expansion. 2. Will highly volatile liquids give more power than water in an engine, from the same fuel? A. Not necessarily.

(14) G. S. C. asks: Could not hot air balloons be used for aerial navigation, if a light furnace were constructed which would constantly run a hot current into the balloon? A. It would be difficult to carry enough fuel for an extended voyage. Fire balloons have been used successfully for short trips.

(15) A. S. E. says: The centrifugal force on the sea board and that on the top of the highest mountain is considerable. The specific gravity is the same. Let a globe be turned rapidly, and water put on; it climbs to its greatest diameter, and flies off. Two canals are cut at the same declivity, one north and the other south; the velocity is the same in both. Neither does this influence affect the wind. Please explain the law that counteracts this influence and produces the equilibrium? A. There is a slight difference in the effect of gravity at the different levels.

(16) C. G. V. P. says: Is it practicable to heat the passenger cars with the steam from the locomotive? If so, in what manner is the steam conducted from the boiler? It seems to be a failure in Europe, and some of my European friends ask me what the SCIENTIFIC AMERICAN thinks about it. A. It might be possible, but it would be necessary to increase the size and weight of locomotives. Steam pipes could be arranged in a similar manner to the air pipes used with continuous brakes.

(17) M. W. H. says: How many lbs. pressure can an ordinary horse exert, when doing its best? A. Between 300 and 400.

1. What is a high pressure engine and boiler? Is it not one that condenses its steam, and uses the water over again? A. In the common acceptance of the term, a high pressure engine is non-condensing. 2. What steam pressure will a vat sustain, if made of 2 inch plank of oak, matched, and covered with heavy sheet iron, both out and inside? It is 3 feet in diameter and 10 feet high? A. Your data are insufficient.

1. How can phosphorus be made into solution for using on gun sights after night and other similar purposes? I dissolved some in hot olive oil, also in turpentine, but it settled and formed a hard body as soon as cooled, in both. What is the trouble? A. Probably the ingredients were not pure. 2. What is the coldest temperature in which phosphorus will glow or show light? A. About 32° Fah.

(18) F. R. H. says: I have an iron tank 4 feet in diameter by 12 feet long, in which I put dead stock to be steamed out. This tank is supplied with steam from a portable boiler and engine. The steam dome is 1 foot high, and the pipe rises from the dome 1 1/2 feet in three turns, and goes 6 feet down into the tank in the bottom. When I turn on the steam to the tank the water blows from the boiler faster than I can pump it into the boiler, at the same time running the steam down. It has only begun acting so lately. Can you tell me how I can overcome this difficulty? A. It is not unlikely that your pump is out of order. You can regulate the amount of steam let into the tank, so that the pump will supply what is taken away.

(19) W. F. A. says: I have tried to bend basswood, but have failed. I gave it a long steaming, and it would break off short. Then I tried a shot steaming, but it worked in the same way. Can you give me some information? A. It is very possible that the specimens you tried were not suitable. It may be that any kind of wood can be bent at pleasure, by a proper treatment, but the methods are not generally known. There is now for sale in this country bent-wood furniture, which is, we believe, manufactured abroad by a secret process.

(20) A. B. says: I saw in the SCIENTIFIC AMERICAN, of January 20, an engraving of a new water velocipede. Please tell me if the two floats would be better if they were of the shape of a triangle, and what should be the distance between the floats? How long, from end to end, and of what size should the paddle wheel be? What should be the thickness of the floats, and what would be the best material to make them, in case of stones or rocks in the river? A. We think the cigar shape is best for the floats. Their size depends on the load to be carried, and must be calculated for any particular case. Distance apart, 2 to 4 feet, according to capacity, will do. They could be made of light iron, for clearwater, and of wood for rocky places.

(21) F. W. B. asks: What power can I use to run a dental engine and a small polishing lathe head? I have tried water motors, but they fail. A. We think there are water motors in the market that will answer. There are also small steam and electric engines suitable for the purpose.

(22) S. N. M. says: 1. I read that the earth's rotation is retarded 22 seconds a century = 0.22 seconds a year. Also that two thousand million years ago, the earth was rotating twice as fast as now. I figure thus: Earth now rotates in 86164.09 seconds, and $\frac{86164.09}{2 \times 10^{22}} = 195,327$ years ago earth rotated twice as fast as now. Am I wrong? I also find the following: "It therefore follows that she was rotating at about the same rapidity as now, when she became solid; and as the rate of rotation is certainly diminishing, the epoch of solidification cannot be more than ten or twelve millions of years ago." How can this be? A. Your calculation does not seem to be correct. The assumption is for 0.22 seconds a year at present. We presume the article gives reasons for the second statement, which is not very alarming to the present generation, even if true.

(23) W. C. W. asks: How will a cast iron vertical boiler, 3 feet high and 15 inches in diameter, shell being 1/2 inch thick, with flat heads 3/4 inch thick, and firebox in base of boiler, with 15 tubes, as compared with a wrought iron one of similar form? A. We think the wrought iron boiler is preferable on many accounts, and advise you not to use cast iron.

(24) W. H. P. asks: Will it require less heat to boil away 100 gallons water in vacuo than under

atmospheric pressure? Would there be a decided gain in the expense of fuel in thus evaporating water? A. The amount of heat required would be a few per cent less in the case of the vacuum.

(25) A. B. says: 1. We intend to put a siphon to draw the water from a part of mines, the height to which the water has to be lifted perpendicularly is 20 feet from the summit. There is 600 feet of tunnel with a grade towards the other end of 6 inches to the 100 feet. We can extend the pipes to a depth of 35 feet, so that the discharging end will be 18 feet below the suction end. Length of pipe in all will be 700 feet. Will it work? A. It will be necessary to have an air valve at the highest point, which must be opened occasionally or may be made automatic. 2. We intend to use 3 inch gas pipe for the siphon, but the present supply of water will probably run through a 1 1/2 inch pipe, and the water will increase in quantity. Can we regulate the siphon so that the present supply of water will run in a continual stream through the 3 inch pipe by putting a stopcock on the discharging end and keeping it open 1/4 or 1 of the time—as the supply of water varies? A. Yes.

(26) A. A. H. asks: How can I remove ink stains from fabrics, fingers, and paper without injuring the article stained? A. To remove ordinary ink (tanno-gallate of iron) stains, the following treatment is recommended: In many cases lemon juice will often prove efficacious. If this fails, try an aqueous solution of oxalic acid (1 part to 2 parts water) and rub well with a soft cloth. Or use a solution of chloride of tin (1 part to 3 parts water, or pure dilute muriatic acid (1 part to 10 parts water). Apply with a camel's hair brush, and then wash in cold water. Where the colors of the fabric are affected by the above treatment, moisten the spots with fresh milk and cover with fine salt. This should be done before washing. If the fabric is fine and delicate, the stained portions may be dipped in melted tallow and then pressed for some time between layers of warm pipeclay. Stains of indelible ink (made from nitrate of silver) may be removed by moistening them with a brush dipped in a strong aqueous solution of cyanide of potassium, and then well washing the fabric in water. The cyanide solution is very poisonous.

How can I gild book covers, picture frames, etc.? A. Fine gold leaf is used for ornamenting books. It is stamped in the covers by a press. On gilt picture frames gold leaf is also used, but in many instances the gold-like finish on these frames is produced by laying on first silver leaf, and then lacquering this with an alcoholic solution of orange shellac, to which is often added gum sandarac and dragon's blood, saffron, gamboge, etc.

(27) J. W. S. says: Can you give me a good formula for making a fluid extract of annatto? A. Annatto is often adulterated with flour, soap, Venetian red, and red lead. Macerate it with twice its weight of alcohol for several hours and filter.

Please tell me how to make a good stencil ink, which contains no oily matter and will dry quickly? A. Rub up a quantity of lampblack in a mortar with enough of a strong, hot solution of dextrin in water to form a paste, and add a little alum water. Solution of soap is sometimes used in place of the dextrin and water.

(28) J. R. K. asks: By what process can I remove the silver from old mirror backs, so that it can be used again? A. If it is silvered, use nitric acid, and crystallize from the solution by evaporation in a small porcelain vessel. If the coating is an amalgam of tin and mercury, use mercury, and loosen the film by rubbing with a cloth.

I have some walnut furniture finished in shellac. It got wet in moving; and wherever the water touched it, it left a white spot. How can I remedy this? A. Rub the spots with a little oil mixed with Venice turpentine.

Is arsenite of copper called Paris green? A. No. Arsenite of copper is known as Scheele's green; Paris green is an aceto-arsenite of copper.

(29) G. J. H. asks: Is there any way to separate tin and copper which have been melted together, so that the copper can be used again? A. Most of the tin may be burned out by prolonged exposure to the air at a high temperature. This is the only practical method we know of. Small quantities of the alloy may be disassembled by dissolving it in a slight excess of strong nitric acid. The insoluble oxide of tin will then settle to bottom of the vessel, when the copper solution may be decanted and the copper precipitated out as oxide with an excess of potassa, soda, or lime. This precipitate may be reconverted into metallic copper by first drying it thoroughly, and then mixing it in a crucible with powdered charcoal, and exposing to a high temperature. The tin may be recovered in a similar way.

(30) W. B. M. says: I want to build a tank 48 inches deep by 48 inches wide by 96 inches long, for boiling linseed oil with steam. What amount of pipe will be required to dissolve the manganese used in boiling that amount of oil? A. This can best be determined by experiment. It may require 150 to 200 feet of inch pipe, but this, of course, is dependent on the temperature attained and the length of time allowed for the operation. There are no accurate data on the subject.

(31) W. B. asks: Is there any possible way to get the turpentine taste out of rosin? A. Pulverize the rosin and boil it for some time with a quantity of water; then dry, and fume it.

(32) O. E. says: I will advise R. L. D., who asks how to harden an eggshell, to lay the egg in vinegar for two weeks. The shell becomes soft, and you can stretch it like a piece of rubber. Lay it in a strong solution of saltpeter for two weeks, and then you cannot strike it to pieces with a hammer.

(33) A. J. J. asks: How can I make an indelible mixture of nitrate of silver, using oil? A. You may make an emulsion of the nitrate in the oil by rubbing them up together in a mortar. It is better to use glycerin instead of oil. Mordant with a strong solution of carbonate of soda.

(34) H. E. W. asks: 1. In the manufacture of electric annunciators, will malleable iron castings answer as well for frames for the magnets, etc., as brass castings? A. Yes. 2. If the magnet cores are screwed