

Business and Personal.

The Charge for Insertion under this head is \$1 a Line.

Agricultural Implements, Farm Machinery, Seeds, Fertilizers. R. H. Allen & Co., 189 & 191 Water St., N. Y.

Magic Lanterns, and 100 Choice Views, for \$85 and upwards, for Churches and Public Exhibitions. Pays well on small investments. Catalogues free. McAllister, Manufacturing Optician, 4 Nassau St., New York.

Fleetwood Scroll Saw, with Boring Attachment, for all descriptions of light Scroll Sawing. See adv't., page 93. Trump Bros., Manufacturers, Wilmington, Del.

Industrial Motor, a monthly, only 50 cts. a year. Thomas G. Orwig, Ed., Des Moines, Iowa.

Makers of all sorts of light wooden packages, send address to A. Robinson, Webster, Me.

Treatise on the Steam Engine Indicator. Price \$1. Address E. Lyman, C. E., New Haven, Conn.

Patent Reports for Sale—1853 to 1869. Box 135, Ipswich, Mass.

Will A. B. C., No. 23 Notes and Queries, Jan. 9th, send his address to Welch & Chipman, So. Boston, Mass.?

For Sale—7 Hydraulic Presses and Pump—one or all. Several Flue, Loco and Upright Boilers, Engines, Shafting, Tools, &c. Consignments solicited. T. Shanks, Machinery Dealer, Shanks' Building, Baltimore, Md.

Marble Cutters' Materials—Marble Putty, the best in market; Pumice, Oxalic Acid, Emery. L. Feuchtwanger & Co., 130 Fulton St., New York.

More than a Million Screws—50 Sizes and Styles—from 1/4 to 1 1/2 inches long—made for sewing machine work. Will sell at less than 1/2 cost. Send sample of screw wanted, stating quantity, and will return sample of nearest we have to it, with price. Hull & Belden Co., Danbury, Conn.

One of the largest advertising houses in the country is that of Geo. P. Rowell & Co., 41 Park Row, New York. We have had transactions with them to a considerable extent, and do not hesitate to commend their method of doing business. Parties desiring to advertise in a large number of papers cannot do better than to communicate with them.—[New York Observer.]

Wanted—To Lease or Buy a 2nd hand Diamond "Core" Drill. Wm. Ross Covell, Georgetown, D. C.

Babbitt Metal—Made from the same receipt, for over 30 years—the celebrated J. B. brand—never known to fail. J. W. Baker, 821 North 2nd St., Philadelphia, Pa.

Wanted—To Sell Canadian Patent for Cole's Automatic Boiler Feed Regulator and Low Water Alarm Combined. Address H. S. Cole & Co., Milwaukee, Wis.

Partner Wanted—To take a third interest in a Foundry and Machine Shop, now in operation. An experienced Machinist preferred. References given and required. For particulars, address G. O. King, Corry, Pa.

J. N. Cassell, Lincoln, Neb., wants a double Curry Comb manufactured on royalty in Combs.

For Sale—Propeller Steamboat, 19 1/2 feet long, 6 feet 2 in. beam, by J. A. Speed, South Newmarket, N. H.

Every Metal Worker should have a Universal Hand Planer. For Catalogue, J. E. Sutterlin, Manufacturer, 60 Duane St., New York.

For Sale Cheap—1 Second hand 40 lb. Hotchkiss Air Spring Hammer. D. Frisbie & Co., New Haven, Ct.

For a proper Party having Capital and Facilities for Manufacturing, I offer Partnership in one or all of Three Patented Articles. Cast Iron, Earthenware, Fine Metal Work. Address S. C., P. O. Box 681, Baltimore, Md.

We want a small domestic patent; must be good and cheap, that sells anywhere. Reed & Co., 335 Broadway, New York.

Wanted—To secure a good Patent, small article preferred, to sell by territorial rights. The inventor of a first rate article will be liberally treated with by addressing Neely, Box 2841, Philadelphia P. O.

The Varnishes and Japans of the London Mfg Co. compare favorably in price with, and are unexcelled in purity, durability, and color by, any first class houses in Europe or America. Hyatt & Co., office 246 Grand St., New York; Factory, Newark, N. J.

Diamonds and Carbon turned and shaped for Scientific purposes; also, Glaziers' Diamonds manufactured and reset by J. Dickinson, 64 Nassau Street, N. Y.

Metallic Pattern Letters and Figures, to put on patterns of castings, all sizes. H. W. Knight, Seneca Falls, N. Y.

Planing Mill Machinery Wanted—Address, price and terms, Hunter & Tilley, Berkeley, Norfolk, Va.

For small size Screw Cutting Engine Lathes and Drill Lathes, address Star Tool Co., Providence, R. I.

Wanted—Official Patent Office Gazette, Volume 1, for which a fair price will be paid. C. O. Thompson, Worcester, Mass.

Inventors of Electrical and Telegraphic arrangements are invited to communicate with the Electro-Magnetic Mfg Co., 36 Broad St., P. O. Box 1804, New York.

Genuine Concord Axes—Brown, Fisherville, N. H.

Protect Your Houses—Champion Burglar Alarm Co., No. 40 West 18th St., New York. Send for circular.

Wanted, by Manufacturer of Steam Engines and Standard Articles, \$20,000. Address John, 1802 Olive St., St. Louis, Mo.

Partners Wanted—More working capital needed. Grounds, Shops, Tools, and Machinery, all in good working order. A rare chance for parties desirous of engaging in the manufacturing business. Correspondence solicited. Address D. Whiting, Ashland, Ohio.

Spinning Rings of a Superior Quality—Whitinsville Spinning Ring Co., Whitinsville, Mass. Send for sample and price list.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement. Andrews' Patent, inside page.

Faught's Patent Round Braided Belting—The Best thing out—Manufactured only by C. W. Arny, 301 & 303 Cherry St., Philadelphia, Pa. Send for Circular.

For Sale—One "Cottrell & Babcock" Water Wheel Regulator, in good order—by Dr. Arthur Brown & Co., Fisherville, N. H.

Price only \$3.50—The Tom Thumb Electric Telegraph. A compact working Telegraph Apparatus, for sending messages, making magnets, the electric light, giving alarms, and various other purposes. Can be put in operation by any lad. Includes battery, key, and wires. Neatly packed and sent to all parts of the world on receipt of price. F. C. Beach & Co., 263 Broadway, New York.

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

Pratt's Liquid Paint Dryer and White Japan surpasses the English Patent Dryers and Brown Japan in color, quality, and price. Send for descriptive circular to A. W. Pratt & Co., 33 Fulton Street, New York.

Fairy Electric Engines, with battery complete, \$6; without battery, \$4. Electro-Magnetic Manufacturing Co., 36 Broad St.—P. O. Box 1804, New York.

Cast Iron Sinks, Wash Stands, Drain Pipe, and Sewer traps. Send for Price List. Bailey, Farrell & Co., Pittsburgh, Pa.

For Solid Emery Wheels and Machinery, send to the Union Stone Co., Boston, Mass., for circular.

Mechanical Expert in Patent Cases. T. D. Stetson, 23 Murray St., New York.

All Fruit-can Tools, Ferracute, Bridgeton, N. J.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon, 470 Grand Street New York.

Brown's Coal-yard Quarry and Contractor's Apparatus for hoisting and conveying materials by iron cable. W. D. Andrews & Bro., 414 Water St., New York.

For Surface Planers, small size, and for Box Corner Grooving Machines, send to A. Davis, Lowell, Mass.

The "Scientific American" Office, New York, is fitted with the Miniature Electric Telegraph. By touching little buttons on the desks of the managers signals are sent to persons in the various departments of the establishment. Cheap and effective. Splendid for shops, offices, dwellings. Works for any distance. Price \$6, with good Battery. F. C. Beach & Co., 263 Broadway, New York. Makers. Send for free illustrated Catalogue.

Temples and Oilcans. Draper, Hopedale, Mass.

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

Peck's Patent Drop Press. For circulars, address Milo, Peck & Co., New Haven, Conn.

Engines and Boilers a Specialty—1st class; new patterns; late patents; reduced prices. Plain and Cut-off Horizontal and Vertical Engines; Hoisting Engines; the celebrated Ames' Portable Engines; Boilers of all kinds; Climax Turbine; and the best Saw Mill in the market. Large stock always on hand. Hampson, Whitehill & Co., 38 Cortlandt St., New York. Works at Newburgh, N. Y.

Buy Boul's Paneling, Moulding, and Dove-tailing Machine. Send for circular and sample of work. B. C. Mach'y Co., Battle Creek, Mich., Box 227.

Small Tools and Gear Wheels for Models. List free. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

Hotchkiss Air Spring Forge Hammer, best in the market. Prices low. D. Frisbie & Co., New Haven, Ct.

Sugar from Sorghum.

In reply to a correspondent who asked for the best process for causing sorghum sirup to crystallize so as to make sugar, we give the following by Stewart: "At the close of the boiling, transfer the cooler to the crystallizing room. Heretwo modes of treatment are to be pursued to suit the kind of product to be obtained. By the first method, a fair, yellow sugar, of a quality equal to that of the ordinary brown sugar of commerce, is the result. By the second, white sugar, or any grade intervening between it and the crude article, may be obtained. As a pre-requisite to success by either method, the crystallizing and draining rooms should be uniformly heated to a temperature of not less than 80° Fah. To secure this, a close room is needed, opening by a door into another apartment instead of by an outside door. The crystallizing vessels should be roughed along the sides and a stove placed in the center. Crystallization and drainage should be performed in the same vessels, and their form should be such as to conduce to both these ends. 1. Crude sugar of good quality and large grain will uniformly result from well defecated sirup of the proper density, at a temperature of 80° to 90° Fah, by means of slow crystallization and natural drainage. The vessels should be shallow to admit of the speedy downward passage of the molasses through the crystallized mass, and their bottoms should be inclined sufficiently to secure its rapid transmission to a common outlet. They should be of a uniform size, and in order to secure a large grained crystallization, should be made moderately large. Vessels conforming to these requirements may be of various forms; but for convenience and general efficiency I give the preference to a form of vessel which the experience of nearly a century has not modified for the better. I refer to Dutrone's crystallizing box, thus described by himself: 'Experience has proved to me that the quantity of matter which combines the greatest number of advantages in the crystallization of cane sugar is fifteen or sixteen cubic feet, for which reason the dimensions given to the crystallizing vessels are five feet in length by three feet in breadth. The bottom is formed of two planes, inclined six inches, the intersection of which forms a groove in the middle. If this groove is twelve or fifteen holes of an inch in diameter, to permit the sirup to flow out. The depth is nine inches at the sides and fifteen inches at the center. The vessels should be made of boards one inch thick, and lined with lead' (or better, coated heavily with iron paint). 'Before lining it, the holes should be bored in the groove, and burnt out with a hot iron from the inside, so as to form a small cavity surrounding the hole, in consequence of which not a drop of sirup will remain after draining.' Such vessels combine every possible advantage in crystallizing and purging with the requisite strength. 'The crystallizing vessels rest upon strips of wood two inches thick and three inches broad, which are fastened to and supported by upright posts eight or ten inches high, at the distance, laterally, of ten inches from the middle line. Troughs connecting with a cistern on a lower level receive the molasses as it drips from the sugar.' These vessels, when filled to within 3 inches of the top, will hold about 75 gallons of sirup for granulation, weighing nearly 1,000 lbs., of which one half, or 500 lbs., will be good dry sugar. The depth of the crystallizing mass in the boxes may sometimes be diminished to 3 inches at the sides, where the bottom is most elevated, and 9 inches in the center, when there is reason to apprehend any difficulty of drainage by reason of the presence of an undue amount of grape sugar, or otherwise. After the molasses has all drained out, this depth will be much diminished, and the large surface of sugar exposed permits it to dry speedily. The number of these boxes that will be required will of course depend upon the amount of work to be done, and the length of time that must elapse before they can be refilled and used again. Two weeks is as short a time as can be reckoned upon for the completion of the crystallization and drainage. It will be found that one of these vessels will be required for each 450 or 500 gallons of juice delivered by the mill during that period. Close the openings in the bottom of the box with long, smooth, wooden plugs, abruptly

pointed, which may be allowed to project through the holes into the inside of the box two or three inches. Range the boxes in order on the supporting rack, around the side of the room and over the dripping troughs, which are so arranged as to convey the molasses into a pointed wooden or tin gutter, and thence into a cistern. The dripping troughs may be simply short open conductors of the same materials. In twenty-four hours after the thick sirup has been passed into the crystallizing box from the cooler, the formation of crystals of small size will generally have commenced. They may then be seen along the edges of the yet liquid mass, but on the bottom of the box they will be found in the greatest abundance, and may be detached and brought to the surface at the shallow sides of the box, by means of a knife blade or the wooden scraper, which should always be at hand. The last-named implement is simply a long paddle of ash or hickory wood, with a stout handle and thin blade. With this the fine crystals should be loosened from the bottom and sides and stirred into the mass so as to distribute them as equally as possible through it, that they may act as nuclei for the formation of larger crystals. Generally in twenty-four hours after this operation, and often in less time, the crystallization will have pervaded the entire mass. When this is found to be so, then gently withdraw the stoppers and permit the molasses to drain. The sugar will be dry in ten days or less thereafter. It may then be shoveled into boxes or barrels, and the crystallizing boxes refilled."



H. C. S. will find directions for molding rubber on p. 283, vol. 29.—E. M. G. will find a recipe for soldering brass on p. 364, vol. 29.—F. W. Z. can find a recipe for a copper dip for iron on p. 90, vol. 31.—C. C. can cement glass to tin by using the preparation described on p. 298, vol. 30.—J. B. can measure the cylinder of his engine by the formula given on p. 16, vol. 29, and by that on p. 54, vol. 30.—R. H. H. can fasten rubber to rubber by using the cement described on p. 203, vol. 30.—J. J. F. will find directions for silvering glass on p. 234, vol. 30.—M. W. H. will find a description of mica on p. 88, vol. 24.—C. E. G. will find directions for stereotyping on p. 363, vol. 30.—N. L. F. can remove paint from window panes by the method described on p. 83, vol. 32.—T. J. C. can blue gins by the process given on p. 123, vol. 31.—F. W. will find directions for molding from living objects on p. 58, vol. 24.

(1) J. E. E. asks: What degree of heat will a diamond bear without injury? Diamonds are said to be destroyed at about 14° Wedgewood or 1,820° Fahrenheit, but they vary in hardness. What would be the effect of a cherry red heat upon a very hard diamond? Would it have a tendency to soften it? What heat will cause a diamond to crack and chip off on the outer surface? A. Heat would not soften a diamond, neither would the stone crystallize at extremely high temperature. Heated intensely, it would burn and be converted into carbonic acid gas, an exceedingly small residue being left behind.

(2) J. J. asks: Will a slit extending from top to bottom in the glass chimney of a lamp be a preventive from breaking by partial rapid expansion or contraction? A. Yes. 2 Do you think a slit would impair combustion? A. No. 3 Does glass require tempering or annealing before leaving the factory? A. Yes.

(3) A. A. F. says: I have tried your recipe for staining wood to a black walnut color, as follows: Water 1 gallon, washing soda 1/2 oz, chromate of potash 1/4 oz. This will not make a stain. It settles at the bottom; and after standing a few moments the water becomes almost clear. A. We have tried this stain and had no difficulty in obtaining a very fine stain, perfectly counterfeiting the color of black walnut. The settling or precipitation of your solution is due probably to impurities in the chemicals or water used. Separate your water into two portions, in one of which dissolve the soda and in the other the bichromate of potash. The solution of soda should be perfectly clear; and when added to the other solution, it should impart a bright yellow color to it. The wood should be steeped in this solution for about one hour, or until the desired shade is obtained. A gentle heat will hasten the process.

(4) M. H. K. asks: What is the kind and character of change that takes place in white of egg when beaten from the shell into a stiff froth? A. The continued beating causes the albumen to become aerated, or mixed with a large quantity of air bubbles.

How can I make a stamp or press, out of other material than wood, to quickly press and shape a lump of butter to fill the table butter dish? A. There is no material, to our knowledge, that will answer the purpose so well as wood.

1. How can I polish a pearl, found in an oyster? A. Try rouge powder. 2. Have such pearls any value compared with others? A. They have no commercial value.

(5) F. W. H. asks: Is rottenstone and linseed oil good for repolishing a piano? A. The rottenstone is used as a polishing powder, the linseed oil to cleanse the surface after having been polished. They are not mixed together.

How can I prepare glue, so as to use without heating? A. Dissolve the best isinglass in the strongest (glacial) acetic acid.

(6) C. R. S. B. says: I curl my hair with a thin gum arabic water. Is it injurious? A. It is of no benefit, and probably of no more injury to the hair than the use of too much water, rendering the hair stiff and dry. 2. What is good to prevent the hair from falling out? A. See p. 363, vol. 31.

(7) E. B. says: I have some elder wine which last summer turned sour, but not sour enough for vinegar. I added 1/2 pint alcohol to the gallon when made. How can I make vinegar of it, fit for the table? A. Add to it a little yeast, or mother of vinegar, which will hasten fermentation.

(8) W. C. says: I have a lot of molded sandstone, saturated with coal oil. How shall I take the oil out? A. Heating to a moderate temperature might be tried, if practicable. Sometimes chalk and magnesia are used to absorb and extract oil stains.

(9) A. M. F. asks: How can a harmless substance be magnetically polarized, to convey into the human system the positive or negative forces, so as to circulate in the blood and so through every part and atom of the body? A. There is not, to our knowledge, anything that is susceptible of magnetic polarization that may be taken into the system in the way you describe.

(10) E. B. J. asks: 1. What can be added to tobacco that will cause the odor of the smoke to smell sweet? A. Try lavender. 2. Can it be made pleasant by passing the smoke through perfumed water or alcohol? A. No.

(11) B. S. asks: What is the behavior of potassium and sodium, and similar metals, in absolute or nearly absolute (95°) alcohol? A. When sodium or potassium is added gradually to absolute alcohol, a brisk action occurs, the temperature rises rapidly, and the metal is dissolved; while an extrication of pure hydrogen takes place, and a fusible, crystallizable, deliquescent compound is formed, which has received the name of sodium alcohol (or potassium alcohol) or of ethylate of soda (or of potash).

(12) W. E. says: I have tried many recipes for tinning articles made of cast iron, some of which are malleable; the last I tried was: "Cover the articles in a solution of sal ammoniac, then dip them in melted tin," but it would not work. A. The operation only succeeds well when the surface of the metal to be tinned is quite free from oxide, and when during the operation the oxidation of the molten tin is prevented. The former requisite is attained by the use of dilute acids, rubbing and scouring with sand, pumicestone, etc. the latter condition, by the use of either rosin or sal ammoniac, both of which cause the reduction of any oxide that may be formed. The objects intended to be tinned are heated nearly to the melting point of tin; they are then dipped into a vessel containing the molten metal, and rubbed with a piece of hemp over which some sal ammoniac is strewn. Pins, hooks and eyes, small buttons, and similar objects are tinned by being boiled in a tinned boiler filled with water, granulated tin, and some cream of tartar. The tinned objects are dried by being rubbed with sawdust or bran. In the manufacture of tinned sheet iron, technically termed tin plate, the iron must first be thoroughly scoured, so as to present a clean metallic surface, and then immersed in baths of molten tin covered by a layer of molten tallow to prevent the oxidation of the metal. On being removed from the tin bath the sheets are immersed in a bath of molten tallow to remove any excess of tin, wiped with a brush made of hemp, next cleaned with bran, and packed.

(13) S. N. M. says, in reply to O. H., who asks: What is the force of blow of the pile of a pile driver, whose weight is 100 lbs., falling 20 feet? "Force is any cause which moves or tends to move a body. Weight is the measure of the force of gravity. Momentum is the quantity of motion, the impetus, the force with which one body strikes another, and is equal to the weight x velocity." This must be the force of the blow of the pile driver. To find the time of falling, equal to $\sqrt{20 \text{ feet} \div 16 \frac{1}{2}} = 1.115$ seconds. To find the velocity $= 1.115 \times 32 \frac{1}{2} = 35.861$ feet per second. Therefore, $35.861 \times 100 = 3586.1$ lbs. = the force of the blow. If there be any demonstrable error in the above, I shall be pleased to learn it. I conceive it possible that it may be said that the momentum is not the same as the force of the blow, estimated in pounds. A. The definition of momentum, given above, that it is the force with which one body strikes another, is incorrect; and indeed, this definition is ordinarily given incorrectly, in elementary works on mechanics. The force of the blow of a pile driver, as we understand it, is a certain weight which would produce, by steady pressure, the same effect as the falling body. The amount of the weight can only be ascertained by experiment.

(14) C. J. L. asks: How can I electrotype from an iron solution instead of copper? A. Use the protosulphate or neutral chloride of iron, a single battery cell, and an iron positive pole.

(15) J. C. C. asks: Have dispatches ever been successfully transmitted on the same wire in both directions at the same time? A. Yes. The Western Union Telegraph Company has been successfully using Stearns' method of sending two messages over the same wire at the same time for several years past.

(16) C. A. C. asks: Will you please explain the process of electrotyping, and the kind of metal used? A. An impression of the objects which you desire to reproduce is first taken in gutta serena or wax, which is then covered with plumbago by brushing with a camel hair brush. The impression is then attached by a wire to the zinc pole of a weakly charged Daniell cell, and a copper plate is attached by a wire to the copper pole of a battery. The impression and copper plate are then dipped into a strong solution of sulphate of copper, when the copper of the solution will begin to deposit itself on the impression, first at the black-leaded surface in the vicinity of the connecting wire; then it will gradually creep over the whole conducting surface. It is usual to keep the impression in the solution for about 24 hours, when the copper deposited on it will have formed a tolerably strong plate, which can be easily removed from the wax. On the side of the plate next the matrix, will be found a perfect copy of the original object.