

Business and Personal.

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Agricultural Implements and Industrial Machinery for Export and Domestic Use. R. H. Allen & Co., N. Y.

The Photo-Engraving Co. have been obliged to remove from 62 Cortlandt St. to a larger building at 67 Park Place. Their Relief Plates for Newspaper, Book, and Catalogue Illustrations are rapidly taking the place of Wood Cuts and are unsurpassed. See advertisement in another column of this paper.

Wanted—A second hand, medium-sized Daniels Planer. Fuller & Bliss, Baldwinville, N. Y.

Wanted—A Grist Mill. C. F. Rice, Brookfield, Ms. The Ransom Syphon Condenser will save you 25 per cent of fuel, or give an equal increase of power. Apply to T. Sault, Consulting Engineer, General Agent, New Haven, Conn.

Wanted—Manufacturers of lamps and lamp-burners to send address to C. C. Snyder, Lyons, Iowa.

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

Wanted—The address of M's of Pencil Cases. Marshall M. Smith, Pat'ee of Adding Pencil, Greentop, Mo.

For Sale—35 in. x 16 1/2 ft. Lathe, \$400; 18 in. x 8 1/2 ft. do., \$125; 15 in. x 8 ft. do., \$100; 9 ft. Planer, \$400; 6 ft. do., \$325; 14 in. Slotter, \$390; Profiling Machine, \$300; Lincoln Miller, \$300. Shearman, 45 Cortlandt St., New York.

Wanted—An Earth Excavator suitable for leveling, also a machine for making deep borings. T. S. Anderson, Greenville, Miss.

Centennial Burglar Alarm sent by mail on receipt of 75 cts. C. H. Fowler, Roslindale, Mass.

2,000 bright, worn-out Gang Saws, 3 1/2 to 4 1/2 inches wide, for sale in lots to suit at 4c. per lb. Gilchrist & Griffith, Mount Pleasant, Iowa

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

Linen Hose for factories—1, 1 1/2, 2, & 2 1/2 inch. At lowest rates. Greene, Tweed & Co., 18 Park Place.

Patent Scroll and Band Saws, best and cheapest in use. Cordesman, Egan & Co., Cincinnati, Ohio.

\$1,000 for any hand sawmill equal to A. B. Cohn's, 197 Water St., New York.

The Bastet Magnetic Engine for running Sewing Machines, Lathes, Pumps, Organs, or any light Machinery, 1-32 to 1/2 horse power. Agents wanted. Address with stamp, 1,113 Chestnut st., Philadelphia, Pa.

Machinist's Tools, second hand, which must be sold in order to close up an old partnership. For pamphlet, giving full description of each tool, address Steptoe, McFarlan & Co., 214 West 2nd St., Cincinnati, Ohio.

Baxter Wrenches fit peculiar corners. Prices reduced. Greene, Tweed & Co., 18 Park Place, N. Y.

The French Files of Limet & Co. have the endorsement of many of the leading machine makers of America. Notice samples in Machinery Hall, Centennial Exposition. Homer Foot & Co., Sole Agents, 22 Platt St., New York.

Centennial Exhibitors, buy your Belting in Philadelphia, from C. W. Arny, 148 North 3rd st., and save freight and trouble. Satisfaction guaranteed.

Trade Marks in England.—By a recent amendment of the English laws respecting Trade Marks, citizens of the United States may obtain protection in Great Britain as readily as in this country, and at about the same cost. All the necessary papers prepared at this Office. For further information address Munn & Co., 37 Park Row, New York city.

Gas and Water Pipe, Wrought Iron. Send for prices to Bailey, Farrell & Co., Pittsburgh, Pa.

Shingles and Heading Sawing Machine. See advertisement of Trevor & Co., Lockport, 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, New York.

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

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

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

Hotchkiss & Ball, Meriden, Conn., Foundrymen and workers of sheet metal. Fine Gray Iron Castings to order. Job work solicited.

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

Leather and Rubber Belting, Packing and Hose. Greene, Tweed & Co., 18 Park Place, New York.

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

Spinning Rings of a Superior Quality.—Whitinsville Spinning Ring Co., Whitinsville, Mass.

For best Bolt Cutter, at greatly reduced prices, address H. B. Brown & Co., New Haven, Conn.

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

Temples and Oilcans. Draper, Hopedale, Mass. All Fruit Can Tools, Ferracuta Wks, Bridgeton, N. J.

Wind Mill Rights Cheap—One county in each State to give for introducing the mill. For terms, &c., address E. S. Smith, Good Hope, Ill.

Notes & Queries

S. W. M. will find a description of the water-freezing machine on p. 82, vol. 33. For a battery for plating, see p. 23, vol. 32.—W. H. B. C. will find directions for bending timber on p. 43, vol. 30.—S. B. is informed that we have published very many descriptions of ice machines, and in every case we have given the inventor's name.—E. T. I. will find full directions for soldering of all kinds on p. 251, vol. 28.—M. C. H. will find directions for making adhesive fly paper on p. 75, vol. 31.—T. J. W. (who does not send his name) will find an explanation of his wheel difficulty on p. 298, vol. 31.—C. S. R. will find directions for molding in paper pulp on p. 170, vol. 30.—B. B. B. will have difficulty in sizing his Indian ink drawing, unless he mixed acetic acid with the ink with which it is made.—

T. D. H. will find directions for making rice glue, suitable for mounting photographs, on p. 155, vol. 32.—A. G. W. will find a recipe for a cement for hard rubber on p. 203, vol. 30. For Babbitt metal, see p. 122, vol. 28.—C. H. J.'s case was one of spontaneous combustion. See p. 23, vol. 33.—T. J. will find directions for etching on steel on p. 250, vol. 27.—H. H. should fill the crack in his marble slab with the cement described on p. 344, vol. 32. For a description of lithographic stone, see p. 298, vol. 31.—L. C. will find a description of Portland cement on p. 199, vol. 31.—T. W. will find directions for brazing band saws on p. 194, vol. 31.—W. S. will find directions for painting brickwork on p. 277, vol. 28.—J. J. R. will find directions for finishing malleable iron castings on p. 138, vol. 29.—G. W. G. will find directions for tinning iron and steel on p. 362, vol. 31.—E. B.'s difficulty with the scaling off of copper from iron arises from the iron not being properly cleaned. See p. 139, vol. 31.—C. E. N. is one of some scores of correspondents who write to us to report the invention of perpetual motion machines. It is strange that people will waste their time on such nonsense.—C. G. will find that marine glue will do to fasten rubber to cloth. See p. 43, vol. 32.—G. S. W. will find a recipe for composition for picture frames on p. 223, vol. 31.—J. M. C. can exterminate ants in sugar by the directions given on p. 234, vol. 27.—P. P. W. will find a recipe for indelible ink on p. 123, vol. 28; for writing ink, see p. 92, vol. 33.—A. A. B. will probably find that celluloid will answer his purpose. See p. 23, vol. 33.—G. F., of Toulouse, France, will find directions for bluing iron and steel on p. 123, vol. 31.—W. B. should consult a physician.—H. T. P. will find directions for cementing leather to iron on p. 42, vol. 28.—H. T. P. will find a recipe for paint for iron chimneys on p. 34, vol. 33.—B. W. G. will find directions for preserving butter on p. 74, vol. 31.—R. D. B. will find a recipe for whitewash for outdoor use on p. 133, vol. 34.—A. M. L. will find measurements of coal per ton on p. 11, vol. 33.—M. J. G. will find a recipe for pure black ink on p. 92, vol. 33.—G. A. S. will find directions for cleaning coins, etc., on p. 217, vol. 26.—W. G. McC. will find directions for molding in plaster on p. 58, vol. 24.—F. J. B. will find a recipe for liquid shoe polish on p. 73, vol. 28.—B. M. W.'s so-called shoe-glass is mica, described on p. 241, vol. 34.—C. G. B. is informed that the words perpetual motion signify a self-moving machine, and no other.—R. C. J. will find that a method of molding paper, applicable to the manufacture of masks, is described on p. 170, vol. 30.—J. A. A. should address the Agricultural Department, Washington, D. C., for seeds.—W. P. C. will find a description of a silver-plating fluid on p. 299, vol. 31. For gold plating without a battery, see p. 116, vol. 32. For nickel plating, see p. 235, vol. 33.—D. A. S. will find directions for preparing peat on p. 1, vol. 29.—A. B. will find directions for making an aquarium on p. 80, vol. 31.—E. W. M. will find directions for making indelible ink on p. 123, vol. 28.—C. C. R. can clean mildew from carpets by the method described on p. 69, vol. 25. For removing stains from marble, see p. 330, vol. 32.—O. D. will find a description of a simple calculating machine on p. 214, vol. 33.—J. A. is right as to the Atlantic cable being coiled in the hold of the Great Eastern.—D. S. will find directions for making fulminating powder for percussion caps on p. 234, vol. 30.—S. P. will find a good recipe for a verde bronze on p. 283, vol. 31.—W. T. will find directions for transferring pictures to wood on p. 138, vol. 30.—G. A. K. will find that the long screwdriver mystery is explained on p. 21, vol. 19.—A. E. B. will find directions for preserving eggs on p. 219, vol. 31.—H. H. B. will find directions for browning gun barrels on p. 11, vol. 32.—C. A. C. will find instructions for distinguishing real from false diamonds on p. 251, vol. 34.—B. J. H. will find a recipe for a depilatory on p. 186, vol. 34.—C. H. M. will find directions for making rubber hand stamps on p. 156, vol. 31.—G. C. A. will find directions for constructing an anemometer on p. 249, vol. 33.—F. N. will find directions for getting tin off tin plate scrap on p. 319, vol. 31.—W. M. will find a formula for the proportions of cone pulleys on p. 180, vol. 28.—A. H. M. can silver his plate glass by the process given on p. 267, vol. 31.—W. H. A. will find a recipe for liquid blacking on p. 73, vol. 28. For bronze liquid, see p. 185, vol. 33. For marking ink, see p. 273, vol. 28.—J. W. S. will find directions for making a tar concrete sidewalk on p. 185, vol. 33.—A. J. H. will find directions for producing a black finish on brass on p. 362, vol. 25. For a black finish on German silver, p. 288, vol. 31.—A. L., S. P., H., G. W. C., H. L. M., G. C. A., J. G. B., H. D. E., E. C. L., A. W. R., J. C. M., and others who ask us to recommend books on industrial and scientific subjects, should address the booksellers who advertise in our columns, all of of whom are trustworthy firms, for catalogues.

(1) W. J. C. asks: Is there any rule for finding the size of the steam ports of a land engine, in proportion to the horse power? A. Multiply the area of the cylinder by the speed of the piston in feet per minute, and divide the product by 4,000. The quotient is the area of each cylinder port in square inches.

(2) W. W. S. asks: 1. Is a rod of all galvanized iron wire cable a safe conductor of electricity? A. The house would be safer with such a rod than without it, provided the earth connections are good. 2. Are not glass insulators, which surround the rod completely, very liable to break by electricity expanding the rod? A. Insulators for lightning rods are worse than useless. Fasten the rod directly to the house by means of metal strips.

(3) F. E. A. says: In electrotyping I have made my impressions in wax, and brushed them with carburet of iron until well polished. I put the wires on the edges of the molds and placed them in a bath of sulphate of copper, attaching the mold to the zinc element of a zinc and carbon battery. There is a copper anode facing the mold, which is connected with the carbon of the battery. The deposit begins immediately and runs over all the high parts of the mold, but will not go down in the letters. I have five cells of bat-

tery. What is the matter? A. Five carbon cells give too high an electromotive force, except, perhaps, for starting. Try two cells. You will find it advantageous, also, to have a number of small wires attached to different parts of the mold, and all connected to the zinc.

(4) G. A. H. asks: Which is the best way to tell good steel? A. By trial of the best known brands.

(5) B. M. says: I have 2 one inch electro-magnets. Can I make an electro-motor by cutting off the current just before the vibrator reaches one magnet, and putting it on the other magnet to draw it back? A. Yes. 2. How long a stroke could I have? A. Probably not much over 1/2 inch. 3. How large and heavy a balance wheel should I have? A. The wheel might be about 3 inches in diameter. 4. How many cells of Calaud's battery would it take to run such a motor? A. Three cells, if the resistance of the coils is about equal to that of the battery.

(6) P. F. asks: Which is the best lightning rod, one that is hollow or one that is solid metal, having the same circumference? A. The solid one is to be preferred.

(7) C. C. W. says: I have constructed an electrical machine. It consists of a glass cylinder about 1 foot long x 5 1/2 inches in diameter. The crank, handle, and standards are of wood. For insulating the conductors, I have long-necked bottles. The rubber is of two thicknesses of very thick flannel. I get no electricity. Can you inform me what the matter is? A. Make the cushion of leather and stuff it with horse hair. Do not insulate it at all, unless you desire to accumulate a negative charge. The prime conductor, however, should be very carefully insulated. It is probable that the bottle is not good enough for the purpose. 2. How can I make an amalgam of zinc, tin, and mercury? A. Amalgam is prepared as follows: One part of zinc and one part of tin are melted together and removed from the fire, and two parts of mercury stirred in. The mass is then transferred to a wooden box containing chalk, and well shaken. Before quite cold, the amalgam is powdered in an iron mortar. Use with a little lard.

(8) D. McC. asks: Who was the first to apply steam to machinery? Was the power of steam discovered before Watt's time? A. We believe the mention of it by Hero of Alexandria, 250 B. C., is the oldest reference to it extant. This answers both questions.

(9) S. R. S. says: I have some dentist's pellet gold alloyed with about 1/4 copper. I want to work it into a ring, but it is so very brittle that it will not work at all. I have tried melting it again and again, but it does no good. How can I make it malleable? A. If in small particles, digest for several days in pure, hot nitric acid. This will extract part of the copper and render the alloy softer. You will find a recipe on p. 139, vol. 33, by means of which the gold may readily be obtained in the pure state, after which it will not be difficult to obtain alloys of any desired fineness.

(10) A. B. T. asks: Is the 120 foot rail, recently made in Pennsylvania, the longest ever rolled? A. No. Rails of 130 feet and upwards were recently made in England.

1. A friend says that there were held in London three grand universal expositions. Is this so? A. There were two principal ones, those of 1851 and 1862; and afterwards a series of ten annual ones, open to all nations, was commenced, but it was discontinued. 2. Was there ever a world's fair held in Russia? A. Not that we know of.

(11) B. J. E. M. asks: How can I make honey mead? A. Boil some honeycombs in water till the residual honey is dissolved, and ferment the liquor. Some persons add a little brandy.

(12) R. C. says: It is claimed by lightning rod dealers that a strip of zinc folded within a sheet of copper will establish a current of electricity, and that the two metals thus combined in the rod will greatly increase its conducting power. As public safety is involved in this, will you please give your views on the combination? A. All bosh. The rod will conduct better if a second copper strip replaces the one of zinc.

(13) J. H. F. asks: India rubber bags used for hydrogen and oxygen gases for the oxyhydrogen light deteriorate in course of time, so that, although there may be no perceptible leak, there nevertheless occurs leakage. Is there any way of preventing this? A. The Goodyear bag, made on the principle of the Macintosh cloth (stout canvas and rubber) will last, with ordinary care, a very long time without appreciable leakage. It is better, when not in use, to keep the bags constantly filled with air, in order to avoid creasing. 2. Would an interior coating be beneficial? How would paraffin answer? A. This suggestion is not practicable.

(14) J. F. asks: Can you tell me a simple method of ascertaining whether well water is pure or not? A. If by purity you mean suitable for drinking and culinary purposes, place a quantity of it in a clean bottle and add a few drops of an aqueous solution of the permanganate of potassa, just sufficient to impart a slight tinge. Allow to stand for several days. If at the end of this time there is no perceptible diminution of the color, the water may be considered safe. If, however, the color has disappeared, the contrary is the case.

(15) E. T. B. says: I have a black walnut stand that has been varnished. What preparation can I use to take the varnish off without injuring the walnut? A. Rub the surface quickly over with a strong solution of potassa in hot alcohol, and immediately afterward with dry sawdust. Finish with pumicestone.

(16) M. P. B. asks: How can I easily give copper cooking vessels the tin lining necessary to keep them fit for their purposes? A. The vessels

intended to be tinned must be well scoured and present a perfectly clean surface. They are then heated to nearly the melting point of tin; and when ready, some molten tin is poured into them and brushed about with a piece of hemp over which some sal ammoniac in powder has been strewn.

(17) L. C. C. asks: 1. How may grease stains be removed from marble? A. Have you tried benzole? 2. How may iron rust stains be removed from marble? A. They cannot be removed without injury to the marble.

(18) H. T. P. asks: In a good article of wheat, what is the proportion of 1st and 2nd class of flour, and what of bran and middlings? A. This depends much upon the method of grinding and preparation. We believe the average to be about as follows: Fine 60, second 13, bran and loss, 27 parts in 100.

(19) W. L. D. asks: Please give me a recipe for iron tonic or wine of iron. A. The so-called wine of iron consists of a solution of the citrate of iron and quinine in a mixture of spirit of wine and water.

How can I make paste blacking? A. Blacking consists of a black coloring matter, generally bone or ivory black, and substances which acquire a gloss by friction, such as sugar and oil. The usual method is to mix the bone black with sperm oil, sugar, and molasses; a little vinegar is then well stirred in, and strong sulphuric acid gradually added. The acid, acting upon the salts of lime in the bone black, produces sulphate of lime and a soluble acid phosphate; the sulphate forms a tenacious paste with the other ingredients, which can be spread very smoothly. The oil serves to render the leather pliable. This makes a liquid blacking; paste blacking contains less vinegar. The proportions should be about as follows: Bone black 8 parts, oil 1 part, molasses 4 parts, sulphuric acid 2 parts, vinegar 2 parts.

(20) C. S. M. asks: Can I advantageously use the refuse lime from gas works for a manure to enrich a sandy soil? I was informed by a gardener that, if I put it on my grounds, it will certainly ruin my land. A. The gardener's statement is correct.

(21) J. S. T. asks: I wish to melt cast steel scraps with cast iron, copper, and brass. I can melt it, but cannot get it hot enough, when melted together, to run a piece of casting. Can I melt it in an ordinary foundry furnace? A. Melt the steel first, then the iron (cast, not wrought) and copper, and finally the zinc. We do not think that you will succeed in obtaining good castings from such an alloy, and, moreover, such a compound metal certainly have little to recommend it.

(22) W. C. R. asks: Where are the chief centers of the carbonate of soda manufacture in America? A. American manufacturers cannot compete with the English in the production of this salt, and consequently there are no manufactories of any account in this country. We cannot find any statistics of this trade.

(23) A. L. E. asks: Please give me a good recipe for removing stains from the fingers after smoking a cigarette? A. Use a little piece of pumicestone with soap and water. This is the least objectionable method.

(24) C. P. H. asks: 1. What will clean whitespots and stains from zinc? A. Try a little fine emery cloth, and finish with powdered pumicestone. 2. What will clean frosted silver? A. Use a rag buff and putty powder.

(25) S. C. asks: Can you let me know an easy way to find the chord of an arc when the radius and degrees are given? A. $Chord = 2 \times (radius) \times \sin(\text{angle})^{1/2}$.

(26) R. & H. say: 1. We have a double oscillating engine cylinder, 3x8 inches, which we desire to put in a steam launch. What dimensions of boiler would be suitable? A. Use a boiler 3 feet in diameter and 4 feet high. 2. Would steel be preferable to iron? A. Either will do. 3. What size of boat would she drive successfully at 6 or 8 miles per hour? A. Use a boat 25 or 30 feet long. 4. What size and number of blades of propeller would you advise? A. Use a propeller 23 or 30 inches in diameter, and of 3 1/2 feet pitch, with 3 blades.

(27) W. S. P. says: 1. I am building an engine of 2 inches bore by 3/4 inches stroke, with a fly wheel 12 inches diameter weighing 16 lbs., running at 300 revolutions per minute with 50 lbs. steam. What power would it develop? A. From 1/2 to 3/4 of a horse power. 2. What would be the proper size for a boiler with single flue? A. Make one 18 to 20 inches in diameter, and 3 feet high. 3. How large a boat would the above engine propel at a speed of 3 or 4 miles per hour? A. One 10 or 12 feet long. 4. Which would answer best, a screw or paddle wheels? If a screw, of what diameter and pitch should it be? A. Use a screw, 16 or 18 inches in diameter, and of 2 1/4 feet pitch.

(28) T. H. W. asks: Can a velocipede be constructed to run with one or more coil springs? The springs are to be wound up with a crank. A. It seems possible.

(29) C. W. says: I say that, by taking an ordinary rubber cane, with a loaded head, by the ferrule end, one can strike a heavier blow than if one grasped the cane in the center. My friends say that more power can be applied by grasping in the center. What is your judgment? A. You have the right idea.

(30) C. L. asks: Gas leaking through pipes has vitiated the air till our nostrils are assailed violently. Is this gas slightly or very injurious to health? A. Very.

Is Bright's disease a disease of the urinary organs? A. Bright's disease is a fatty degeneration of the kidneys; and it is so called because Dr. Bright, in 1827, first pointed out the frequent connection of anasarca and other dropsical affections with a degeneration of the structure of the kidney.