

**Business and Personal.**

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Agricultural Implements and Industrial Machinery for Export and Domestic Use. R. H. Allen & Co., N. Y.  
For Bolt Forging Machines and Power Hammers, address S. C. Forsyth & Co., Manchester, N. H.

For Sale—State and County Rights of Patent on a first class Wash Boiler. Works splendidly. Address Frank Macklin, Jonesboro', Union Co., Ill.

Pure Mineral Lubricating Oil, for oiling machinery or mixing with animal or vegetable oils to prevent spontaneous combustion. Geo. Allen, Franklin, Pa.

Wanted—Manufacturers of Isinglass Boxes to address B. Frank Weyman, Pittsburgh, Pa.

Steam Launch for Sale, 32 ft., new. Address Morgan's Steamboat Works, Noank, Conn.

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.

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

Patentees—desiring light articles manufactured in Steel, Gray or Malleable Iron, and Brass, address Welles Specialty Works, Chicago, Ill.

Pattern Makers can get Metallic Pattern Letters, to letter patterns, of H. W. Knight, Seneca Falls, N. Y.

A Bargain—Steam Yacht, 30 ft., complete; also 4 h. p. Engine, propeller and shaft. Lock Box 140, Washington, D. C.

Wanted—Address of Makers of No. 1 Cider Mills. F. C. Homes, Waverley, Illinois.

Wanted—New or second hand Punch, to punch seven eighths plate, inch and quarter hole; or gang drill. J. & T. McGregor, Detroit, Mich.

Best Belt-Pulleys—A. B. Cook & Co., Erie, Pa.

Centennial Exhibition, Philadelphia.—Examine the Allen Governors, Machinery Hall, D. 9, Par. 71.

Machine-cut brass gear wheels, for models, &c. List free. D. Gilbert & Son, 212 Chester St., Phila., Pa.

For Sale.—35 in. 16 1/4 ft. Lathe, \$400; 22 1/2 in. 22 ft. do., \$250; 20 in. 7 ft. Stover's do., \$215; 13 1/2 in. 6 1/2 ft. do. and chuck, \$125; 9 ft. Planer, \$390; 12 in. Slotter, \$390; Profiling Machine, 2 spindles, \$250. Shearman, 45 Cortlandt St., N. Y.

Rubber Hydrant Hose, Hose Pipes and Couplings, best quality. Send for Prices to Bailey, Farrell & Co., Pittsburgh, Pa.

"Dead Stroke" Power Hammers—recently greatly improved, increasing cost over 10 per cent. Prices reduced over 20 per cent. Hull & Belden Co., Danbury, Ct.

Driving Belts made to order, to accomplish work required. Send full particulars for prices to C. W. Army, 48 North Third St., Philadelphia, Pa.

Power & Foot Presses & all Fruit-can Tools. Feracuta Wks., Bridgeton, N. J. & C. 27, Mch. Hall, Cent. 1.

Johnson's Universal Lathe Chuck—Awarded the highest Premium by the Franklin Institute of Phila., for "Durability, Firmness, and adaptation to variety of work." Lambertville Iron Works, Lambertville, N. J.

Safety and Economy—Eclipse Sectional Steam Boiler. First Class references. Lambertville Iron Works, Lambertville, N. J.

Woman's Shoes—Patent for Sale, either whole or State Rights. Address C. Steckel, 199 Allen St., N. Y.

For Sale—24 in. x 24 ft. Lathe, with Chuck; two 13 in. Lathes; one 7 ft. x 24 in. Planer; two 8 in. Shapers. E. P. Bullard, 48 Beekman St., New York.

For the best Patent Self-Opening Gates for Carriages, in any Style of Wood or Iron, address Cotton & Co., Dayton, Ohio.

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.

Walrus Leather and Walrus Leather Wheels for polishing. 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, French Department, Centennial Exposition. Homer Foot & Co., Sole Agents, 22 Platt St., New York.

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.

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.

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

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

Rotary Fire or Supply Pumps, belted, two styles outfit—One, plain, \$125; the other, with water gauge, safety valve, and air chamber, \$175. Capacity, 10 to 500 gals. per minute. M'F's, S. C. Forsyth & Co., Manchester, N. H.

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.

See Boulton's Paneling, Moulding, and Dovetailing Machine at Centennial, B. 8-55. Send for pamphlet and sample of work. B. C. Mach'y Co., Battie Creek, Mich.

**Notes & Queries**

M. J. D. will find a description of wire rope transmission on p. 370, vol. 31.—C. F. S. will find directions for bleaching straw on p. 11, vol. 32.—W. H. C. is informed that lightning rods need not be insulated. See p. 144, vol. 31.—G. H. W. will find directions for staining wood black on p. 50, vol. 33.—A. A. H. can clean articles to be plated by following the directions on p. 187, vol. 31.—A. F. B. will find directions for kalsomining on p. 393, vol. 34.—T. E. S. will find directions for making manifold paper on p. 363, vol. 31.—D. C. W. will find directions for converting cider into vinegar on p. 122, vol. 34.—K. K. will find a description of the process of making artificial butter on p. 119, vol. 30.—E. D. will find, on p. 298, vol. 34, directions for cleaning and polishing brass instruments.—A. W. T. will find an answer to his question as to gases evolved from exploded gunpowder on the editorial pages of this issue.—L. D. will find a description of the ditching machine about which he inquires on p. 335, vol. 32.—J. K. B. will find a recipe for birdlime on p. 347, vol. 28.—G. C. P. Jr., will find a description of a means of testing for arsenic on p. 257, vol. 29.—W. F. can clean his bright steel work by the process described on p. 56, vol. 33.—W. H. P. will find directions for making rubber varnish for waterproofing on p. 274, vol. 32.—S. C. M. will find particulars of the lifting power of hydrogen on p. 74, vol. 30.—O. W. J. will find directions for galvanizing on p. 346, vol. 31.—G. E. will find directions for lacquering brass and bronze on p. 240, vol. 34.—R. R. P. will find directions for making a concrete floor on p. 185, vol. 33.—W. K. L. will find directions for tinning iron wire on p. 362, vol. 31.—W. E. J. can clean vessels that have had kerosene in them by the process detailed on p. 276, vol. 34.—J. W. F. will find a description of the long and short screwdriver mystery on p. 21, vol. 19.—C. M. C. should read our article on p. 170, vol. 32, on the volume and compression of gases.—A. N. will find a description of chromic cement on p. 395, vol. 34.—E. L. W. will find instructions for putting up a lightning rod on p. 144, vol. 31.—H. K. A. is informed that the diving rod is an imposition.—H. J. W. will find on p. 362, vol. 31, directions for tinning malleable iron castings.—J. H. S. will find on p. 164, vol. 30, an article on oil in boilers. As to zinc in boilers, see p. 36, vol. 32.—C. W. L. should calculate the horse power of his engine for himself. See p. 33, vol. 33.—C. L. B. can color billiard balls by following the directions on p. 362, vol. 30.—J. H. S. will find directions for putting up lightning rods on p. 144, vol. 31.—C. W. will find a recipe for durable whitewash on p. 133, vol. 34.—H. H. B. will find on p. 11, vol. 32, directions for bronzing gun barrels.—G. B. B., R. H., S. L. H., G. B., and many 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) J. W. D. asks: Is it possible to obtain lodestone in its natural state? A. Yes. Lodestone or magnetic oxide of iron (magnetite) is a mineral very widely diffused throughout the United States and Canada. It is found in immense quantities in the northern part of New York State, in the Adirondack region, and in Canada. 2. Has a lodestone more attractive power than a steel magnet? A. No; artificial magnets of iron and steel greatly surpass it in power.

(2) W. E. C. says: In your No. 22, current volume, A. McC. says there is an engine in his vicinity of 18 x 24 inches; it runs at 90 revolutions per minute with 60 lbs. steam, cuts off at 3/4 stroke, and is rated 50 horse power; and the company are dissatisfied at the amount of coal burned, namely, 1 1/2 tons. An engine of this description (throttle wide open) with 60 lbs. boiler pressure, allowing 50 lbs. pressure in the cylinder, would show about 105 horse power, and a consumption of coal of 2 1/2 lbs. per hour per horse power, which is a very good showing for a non-condensing engine, and better than the average. A. If such a result could be verified by experiment, A. McC. would have very good reason to be satisfied. Our remarks were based on his rating of the power.

(3) R. S. asks: Will a fly wheel running twice as fast as an engine, on countershaft, be any advantage over driving from main wheel of engine? A. Not necessarily.

(4) G. C. S. asks: How much steam space should there be in a boiler for an engine of 2 inches bore and 4 inches stroke, running at 400 revolutions per minute? A. It should be 1/4 or 1/2 the water space.

(5) A. D. A. asks: How is a fog horn constructed for attachment to a steam whistle? A. It is usually a whistle with a sound trumpet attached.

(6) A. G. says: We have a dry house, 13 x 20 feet, which is properly provided with about 400 feet of one inch pipe, through which live steam from the boiler passes, and escapes through a cock outside the building. Although the house is nearly boiler tight, and has proper ventilation, we are not able to increase the heat above 170° or 180° Fah. We intend to superheat the steam by means of a coil of pipe in a stove. Will it be best to superheat the steam first, let it pass through the 400 feet pipe, and escape, or should we let the live steam pass through the 400 feet pipe, then superheat it outside the building, and introduce the superheated steam into the dry kiln? A. We would advise you to try a new plan. Heat the air in a separate chamber from that of the drying room by concentrating the pipes therein. Let the air from this hot chamber enter the drying room at the ceiling, and provide for its escape at the bottom, so as to secure a constant change and renewal thereof. Place a steam trap at the end of the heating pipe. Put full head of steam on to your

coils, and you will probably improve the drying capacity of your room without superheating. If you should try this plan, please communicate to us the result.

(7) W. T. P. asks: How many cups of Lockwood battery will it take to run a telegraph line two miles long, having 70 instruments of about 60 ohms resistance each? A. Twenty-five or thirty.

(8) P. & W. ask: 1. For an electric light apparatus, would 50 cups carbon battery, using a lamp made after the Dubosc pattern, answer? A. Yes. 2. Would the apparatus illuminate a distance of five blocks? A. Yes. 3. How large are the points used? A. Use 3/4 inch square carbons. They come in lengths of 8 or 9 inches.

(9) W. M. J. asks: 1. Would a copper conductor 1 1/4 inches wide, riveted to an iron bar of same width 1/4 inch thick and spliced by bolting, allowing the ends to pass 6 or 8 inches, make a good conductor for a lightning rod? A. Yes; but it is better to use copper altogether, and too much care cannot be taken to insure good earth connection. 2. Would insulators be any benefit? A. No, on the contrary. 3. Would black paint affect the conducting power? A. No.

(10) F. E. H. asks: What is the best means of examining the electricity in a lightning rod, when a thunder cloud is passing over? A. Don't try any. You may find it very unsatisfactory work.

(11) I. M. asks: How is the power applied from the pendulum to the wheel work in an electric clock? I am a telegraph operator, and wish to attach one to my battery. A. An electro-magnet is placed in the electric clock and so arranged that each movement of the armature, acting on an escapement, pushes the hands forward. The circuit is made and broken at every swing of the pendulum of the regulating clock, the upper part of the pendulum being provided with the necessary attachments.

(12) H. B. H., of Havana, Cuba, asks: We are putting up a telegraph alarm, worked by Leclanché's battery, using double wire circuits. What proportion of cells to wire should we use? A. Use one cell for every 2 or 3 ohms of resistance in the circuit.

(13) W. H. S. asks: How is the varnish, used on plaster patterns, made? A. We believe paraffin is employed for this purpose.

(14) A. A. asks: What can I put into green ink, made with verdigris, to make it darker? A. Try a little sulphate of indigo.

(15) M. D. C. says: I am rendering tallow in a large oil cask by introducing open steam in the side of cask, near the bottom. I use 8 or 10 lbs. sulphuric acid to each 1,200 or 1,500 lbs. of rough suet. After settling overnight, the greater part of the tallow rises to the top and is clear and good, but there is still considerable in the tank that is mixed with the fine particles of meat which has been cut by the acid. Can you help me? A. Digest the fatty matter for about 48 hours with very weak oil of vitriol. Transfer a quantity of this material (the solid) to the cask, and for every 10 lbs. material add 5 pints water and 3 ozs. sulphuric acid (specific gravity 1.845). Introduce a jet of steam and boil for some time. The liberated fatty matter as it floats on the surface may be drawn off; and after the addition of a little oil of vitriol to the residue remaining in the cask, a new charge of material may be introduced and the process repeated. The accumulated residue of animal matters and scrap may be used as a manure, or mixed with sawdust for a fuel.

(16) E. H. asks: What is the relative economy in fuel of the three different kinds of steam boilers, namely, the locomotive, the return tubular, and the upright tubular boilers, for portable engines? A. So far as we know, the difference in economy of the various styles is not very great, if all are proportioned and set equally well.

(17) W. O. P. says: 1. Other things being equal, which will give the best result for a propeller, a double engine of three horse power in each, or a single engine of six horse power? A. The single engine. 2. What size should the boat and screw be to make ten miles per hour, with six horse power? A. Boat 20 to 22 feet in length. Propeller 2 feet in diameter and 3 feet pitch.

(18) E. W. asks: Will a cylinder 1 1/2 inches in diameter, of 3 inches stroke, propel a boat 16 feet long, of 5 feet beam? A. No. The engine is scarcely large enough.

(19) The Brethren, of Reutlingen, Würtemberg, say: We want to bend strips of oak or beech lumber 1 1/4 inches square to a circle of 18 inches diameter, for chair work. We have cut the strips of green lumber and steamed them for different lengths of time; but as soon as we tried to bend them, they break right off. How can we do it, under what pressure of steam, and how long has the lumber to be in the box? A. A low pressure of steam only is necessary; and where the bending is excessive, the operations must be gradually conducted, clamping the wood, and exposing it to the action of steam for several hours each time. It is also necessary to use a very good quality of material.

(20) M. & Co. say: The escape of steam from our engine goes into our brickstack. Is there any danger of the steam injuring the mortar between the bricks, and eventually throwing the chimney down? A. Steam frequently has thus acted under the circumstances stated.

(21) J. S. says: How thick a wire rope and what size of solid round iron do I want to stand the falling weight of drilling tools, the largest weighing about 2,500 lbs.? A. We advise you to address your query to a manufacturer. We could not answer it without knowing more particulars.

(22) J. B. E. asks: 1. What will be the difference in pulling 2 screw tugs, each with a 20 x 24 inches cylinder and 7 1/2 feet wheel, drawing 8 1/2 feet water, or a tug with double cylinders 20 x 24 inches, wheel 9 1/2 feet, drawing 10 1/2 feet water? A. The data are insufficient to enable us to answer this question. In any case, we could only obtain a rough approximation by calculation. 2. I have a tug, cylinder 20 x 24 inches with independent cut-off, working the cut-off on half and full stroke on link. The engine pounds. Is it caused by the lead? A. The pounding may be due to various causes, to improper arrangement of valve motion, lack of adjustment of working parts, or improper fitting of crosshead or crank pin brasses.

(23) J. J. M. says: I have an engine with one pair of cylinders, 6 inches by 8 inches stroke, running at 100 revolutions per minute with 40 lbs. steam in boiler. I wish to condense the exhaust steam in a surface condenser. Please tell me how many square feet I need. A. About 60 square feet will be quite enough.

(24) H. L. B. asks: Will the air contained in an air chamber on a pipe over a faucet escape with the water after a time? Will air remain in an air chamber under a heavy pressure of water, if the water is kept in a state of rest? A. The air absorbed by the water, under heavy pressure; but in the first case mentioned, the air chamber frequently receives supplies of air from the water.

(25) F. N. asks: 1. Should a chimney be wider inside at the top than the bottom, and if so, why? A. We do not know of any good reason for this mode of construction. 2. Should the inside diameter be equal throughout? A. As the products of combustion grow cooler as they ascend, and occupy less volume, the chimney could be gradually contracted from the bottom to the top, without serious loss of efficiency.

(26) J. D. D. says: 1. I propose to build a steamboat with a keel 112 feet, beam 17 feet, of good model, with side wheels 15 feet in diameter, with paddles 4 feet long x 12 inches wide. Draft, when loaded, is 30 inches. I shall use a locomotive boiler, 14 feet long by 4 feet diameter, with a firebox 42 x 48 inches, having 60 tubes 2 1/2 inches in diameter, and 10 feet long, which I propose to set in a brick arch, burning wood, with fire under the barrel instead of in the firebox, and returning through the firebox and tubes and over the top of boiler. Would there be any objections to setting the boiler in this manner? A. Its efficiency would be somewhat diminished. 2. My engine cylinder (oscillating) is 13 inches x 60 stroke, using steam at 75 lbs. and cutting off at 1/4 or 1/2 stroke. Is the cylinder large enough for the boat? A. Yes. 3. Will the boiler make steam enough to drive the engine at 50 revolutions per minute? A. No, not more than 25 or 30. 4. How much slip will the wheels have? A. About 15 or 20 per cent. 5. Are the wheels of proper proportion for the hull? A. They will answer very well.

(27) W. G. H. says: 1. I have made a small engine; size of cylinder is 1 1/2 by 2 1/2 inches, running at 200 revolutions per minute. Would a locomotive boiler of the following dimensions generate sufficient steam to run it? Length of firebox 7 inches, height of firebox 6 inches, width of firebox 6 inches, diameter of waist 6 inches, number of tubes 3, diameter of tubes 2 inches, length of tubes 11 inches. A. The boiler is rather small. 2. What pressure would the above stand, if made of 1/8 inch copper? A. The safe working pressure would be from 60 to 70 lbs. per square inch.

(28) L. P. S. asks: Has there been any plan for a governor devised on the principle of the gyroscope? A. There have been a number of governors devised on that principle. So far as we know, they have not come into extensive use. One was proposed for the Bessemer channel steamer.

(29) L. R. asks: How can I clean dirty oil from the drippans under hangers? A. Filter it through plugs of cotton wool.

**COMMUNICATIONS RECEIVED.**

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

- On Lighting Lamps by Electricity. By W. H. Z.
- On a Perpetual Motion. By W. J.
- On Flying Machines. By M. K.
- On Nitrogen. By E. A. H.
- On the Bedbug. By —.

Also inquiries and answers from the following: D. H. E.—A. B.—E. J. P.—W. M. C.—J. H. P.—A. B.—G. F.—O. P. B.—L. H. E.—F. F.—D. G. W.—G. D.

**HINTS TO CORRESPONDENTS.**

Correspondents whose inquiries fail to appear should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them. The address of the writer should always be given.

Enquiries relating to patents, or to the patentability of inventions, assignments, etc., will not be published here. All such questions, when initials only are given, are thrown into the waste basket, as it would fill half of our paper to print them all; but we generally take pleasure in answering briefly by mail, if the writer's address is given.

Hundreds of inquiries analogous to the following are sent: "Whose is the best washing machine, run by steam power? Who sells corrugated iron? Who sells machines for beveling the edges of straw boards, etc.?" All such personal inquiries are printed, as will be observed, in the column of "Business and Personal," which is specially set apart for that purpose, subject to the charge mentioned at the head of that column. Almost any desired information can in this way be expeditiously obtained.