

Business and Personal.

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

Dry steam dries green lumber in 2 days, and is the only Cheap House Furnace. H. G. Bulkley, Cleveland, O.

Hoadley Portable Engines. R. H. Allen & Co., New York, Sole Agents, and Makers and Dealers in Agricultural Machines.

For Sale—Large lot second hand Machinists' Tools, cheap. Send for list. I. H. Shearman, 45 Cortlandt Street, New York.

Microscopes, from 50 cts. to \$500, for Scientific investigation and home amusement. Magnifying Glasses, Spy Glasses, Telescopes, and Lenses. Price List free. McAllister, M'g Optician, 49 Nassau St., New York.

Fleetwood Scroll Saw, with Boring Attachment, for all descriptions of Light Scroll Sawing. See advt., page 235. Trump Bro's, Manufacturers, Wilmington, Del.

Hearing Restored. Great invention. Book free. G. J. Wood, Madison, Ind.

Gold Solution—Will plate 18 K. color, without battery. Send for circular. Warner Bro., Syracuse, N. Y.

Persons having new or second hand Iron Working Tools—say Planers, Lathes, Drills, Power Hammers, all medium sizes—address, with particulars, William Morehouse, Buffalo, N. Y.

The Best Wooden Pulley made; fastens without keys or set screws. Adjustable Dead Pulleys stop loose pulleys and belts when machinery to which they belong is not in motion. Cold Rolled Shafting, Improved Couplings and Hangers. A. B. Cook & Co., Erie Pa.

Geo. P. Rowell & Co., 41 Park Row, New York. It is indeed no surprise that their house is so prosperous, and that they are the leading advertising agents in the world. We would prefer, so far as we are concerned, to have a column or more of miscellaneous advertisements from this firm, than to receive the same amount made up of one direct from each house on their list. The commission allowed is saved us by losses, as they pay every cent they contract for, and pay it promptly, and the keeping of one open account with such a firm is much pleasanter than with the thousand persons whom they send us advertisements for. They do an honorable, legitimate business, on a business basis. If publishers, having dealings with them, want anything in their line—and they supply everything from a spring bodkin to a cylinder press—types, inks and all, they fill their orders promptly, at manufacturers' prices, and we can say that we have received the best newspaper and book ink ever furnished us at a lower price than we ever bought for elsewhere. The Republican has had dealings with this house for over six years, and in all that time, we never have had any reason to complain of our treatment. —[Meriden (Ct.) Repub'n.]

A Publishing firm, established since 12 years, and doing an extensive business throughout the United States and the Dominion, wishes to take hold of some new patented articles, either to push the sale of the same, or with the view of buying the patent. Address 'A. Z.' P. O. Box 5348, New York.

Grind Winter Wheat—New Process. John Ross, Williamsburgh, N. Y.

Steam and Water Gauge and Gauge Cocks Combined, requiring only two holes in the Boiler, used by all boiler makers who have seen it, \$15. Hillard & Holland, 87 Gold St., New York.

A valuable R. R. Patent for sale cheap; small amount of cash and small royalty. P. O. Box 3229, N. Y.

Wanted to manufacture, on royalty, a Patent of Cast Iron. Purves & Savery, cor. Christian and Swanston Sts., Philadelphia, Pa.

Pipe and Bolt Threading Machines. Prices from 80 up. Address Empire Manufacturing Company, 48 Gold Street, New York.

The "Little Monitor" Sewing Machine is the greatest achievement of the age. It uses the commercial Spool without rewinding, & makes three kinds of stitches. Ag'ts wanted. G. L. Du Laney & Co., 697 Broadway, N. Y.

Johnson's Universal Lathe Chuck. Medal awarded by the Franklin Institute for "durability, firmness, and adaptation to variety of work." Lambertville Iron Works, Lambertville, N. J.

Electricity: Its Theory, Sources, and Applications. By John T. Sprague. 8vo, cloth, with engravings. \$3.00. Mail free. E. & F. N. Spon, 446 Broome St., N. Y.

Wanted—A two horse Baxter Steam Engine, and note over one year in use. Address, with price, and state where it can be seen, A. A. Qutaby, P. O. Box 2, N. Y.

Machine Tools, 2d H'd, for sale: 1—20 ft. Lathe, 2—10 ft. Lathe, 1—9 ft., 1—12 ft., 1—6 ft.; several Speed Lathes, Crank Planer, 2 Upright Drills, 1 Planer, 1 Bolt Cutter, etc. For list, address Forsaith & Co., Manchester, N. H.

Engines, 2d H'd, for sale: Portables, as follows—2—25 h.p.; 1—35 h.; 1—8 h.p.; 1—6 h.p.; 1—4½ h.p.; 1—4 h.p. Also, 50 h.p. Chubbuck Engine, 50 h.p. Boiler, 18 h.p. Boiler, and several small Engines. For list, address Forsaith & Co., Manchester, N. H.

Wood-Working Machines, 2d H'd, for sale: 2 Circular Saw Mills, complete; 1 Up and Down Mill with 2—24 in. wheels, complete; Shingle Mill and Joiner; Lath Sawing Machine; Portable Grist Mill and Cob Cracker; Daniel's Planer; Stationary and also Rotary Bed Planers; Blanchard Spoke Lathe; Blake No. 2 Steam Pump; Japanning Furnace; Suction Blower, etc. For list, address Forsaith & Co., Manchester, N. H.

For best Bolt Cutter, at greatly reduced prices, address H. B. Brown & Co., 25 Whitney Avenue, New Haven Conn.

Second hand Machine Tools for Sale cheap. D. Frisbie & Co., 25 & 28 Grand St., New Haven, Conn.

For Sale by Geo. W. Grice, 426 Walnut St., Philadelphia, Pa.: One 2nd hand Dummy Engine, Cyl. 6x10, Gauge 4 ft. 8½ in.; two 2nd hand Locomotives, 25 tons. Gauge 4 ft. 8½ in.; one new Locomotive, 6 tons, Cyl. 6x10, Gauge 3 ft.; one new Locomotive, 10 tons, Cyl. 10x16, Gauge 3 feet 2½ in.

Rights for Sale—Wooden article—2947 N. Y. P. O.

Bolt Headers (both power and foot) and Power Hammers a specialty. Forsaith & Co., Manchester, N. H.

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

Novelties, Notions, etc., introduced here. Communicate with C. L. Williams & Co., San Francisco, Cal.

See N. F. Burnham's Turbine Water Wheel advertisement, next week, on page 397.

Millstone Dressing Diamond Machines—Simple, effective, economical and durable, giving universal satisfaction. J. Dickinson, 64 Nassau St., New York.

2nd Hand Engines and Boilers for Sale at Low Prices. Address Junius Harris, Titusville, Pa.

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

Peck's Patent Drop Press. Still the best in use. Address Milo Peck, New Haven, Conn.

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., 246 Canal St., New York, Makers. Send for free Illustrated Catalogue.

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

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

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

All Fruit-can Tools, Ferracute W's, Bridgton, N. J.

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

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

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

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

The Lester Oil Co., 183 Water St., N.Y., Exclusive Manufacturers of the renowned Synovial Lubricating Oil. The most perfect and economical lubricant in existence. Send for Circular.

Temples and Oilcans. Draper, Hopedale, Mass.

For 13, 15, 16 and 18 inch Swing Engine Lathes, address Star Tool Co., Providence, R. I.

Three Second Hand Norris Locomotives, 16 tons each; 4 ft. 8½ inches gauge, for sale by N. O. & C. R. R. Co., New Orleans, La.

Agents—100 men wanted; \$10 daily, or salary selling our new goods. Novelty Co., 300 Broadway, N. Y.

Thomas's Fluid Tannate of Soda never fails to remove Scale from any Steam boiler; it removes the scale-producing material from all kinds of water; cannot injure Boiler, as it has no effect on iron; saves 20 times its cost both in Fuel and repairs of Boiler; increases steaming capacity of Boiler; has been tested in hundreds of Boilers; has removed Bushels of Scales in single cases. It is in Barrels 500 lb., ½ Bbls. 250 lb., ¼ Bbls. 125 lb.. Price 10 cents per lb., less than ½ price of other preparations, and superior to all others. Address orders to N. Spencer Thomas, Elmira, N. Y.

For Tri-nitro-glycerin, Mica Blasting Powder, Electric Batteries, Electric Fuses, Exploders, Gutta Percha Insulated Leading Wires, etc., etc., result of seven years' experience at Hoosac Tunnel, address Geo. M. Mowbray, North Adams, Mass.

Genuine Concord Axles—Brown, 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., 246 Canal St., New York.

For price of small copper boilers to drive small steam engines, address, with dimensions, and enclose stamp to Geo. Parr, Buffalo, N. Y.

The best goods are the cheapest in the long run, when wear of machinery and difference in power required are considered. All who have tested E. H. Kellogg's Engine, Spindle, Signal, Cylinder, and Sewing Machine Oils freely acknowledge the fact. Manufactured only by E. H. Kellogg, No. 17 Cedar St., New York.

The "Lehigh" Emery Wheel. A new patent. Address Lehigh Valley Emery Wheel Co., Weisport, Pa.

"Book-Keeping Simplified." The double entry system briefly and clearly explained. Cloth \$1. Boards, 75 cts. Sent postpaid. Catalogue free. D. B. Waggener & Co., 424 Walnut Street, Philadelphia, Pa.

A complete bedroom earth closet for \$5. Send for pamphlet. Santarian M'g Co., 44 Courtlandt St., N. Y.

Hydrant Hose Pipes and Screws, extra quality, very low. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

American Metaline Co., 61 Warren St., N. Y. City. Grindstones, 2,000 tons stock. Mitchell, Phila., Pa.

Notes & Queries

R. J. can dye cotton goods by the process described on p. 405, vol. 29.—A. J. B. can proportion his safety valves by the formula given on p. 363, vol. 29.—R. N. can make lard oil by the process given on p. 233, vol. 30.—R. S. T. will find a good recipe for furniture polish on p. 315, vol. 30.—R. N. S. can blue steel by the method detailed on p. 123, vol. 31.—N. T. will find, on p. 53, vol. 24, descriptions of various processes for molding.

(1) J. W. R. says: I have a boiler 16 feet by 40 inches, with 2 flues of 14 inches each and a 30 foot stack. My engine is 8 by 16 inches, running at 180 revolutions, and it does good work at 50 to 80 lbs. of steam. But it costs me all I make to pay for wood for fuel, burning 2 cords per day. I think my work ought not to take over ½ of a cord per day. Is there really that difference between a two-flued boiler and a tubular or locomotive boiler? A. We do not think that the amount of fuel burnt is excessive. Measure your feed water, if possible, so as to get some idea of how much water is evaporated.

(2) F. S. S. asks: Will the flesh or grain side of a belt give the most friction? Which will wear the longest? A. A belt should be run with the grain side next the pulleys for both reasons.

(3) C. M. asks: Is there any cement that will answer to cast hot metal in, which would last for a long time? The metal runs at about 1,200° Fah., and it is necessary that the mold should get very hard, have a good polish, and not contract or expand more than iron. A. No. Iron is best. Use plaster of Paris for light castings.

(4) G. B. P. asks: What is saleratus? A. It is bicarbonate of soda.

(5) W. P. says: In your issue of April 10, 1875, C. H. P. asks: What is the difference between one square mile and one mile square? You answer: None. You are wrong. There is as much difference as between a circle and a square. A mile square is a square surface having sides each a mile in length. A square mile is a unit of area, and may be of any shape; and although it may be a milesquare, it is not necessarily so. A. You are wrong. The difference between two quantities is found by subtracting one from the other. If nothing remains, what is the difference?

(6) J. H. F. asks: In building an ice house, I constructed a dumb waiter which I can lower to same level as bottom of house. I am told that whatever is put therein, as meat, milk, butter, will taste of the new wood lining down which the waiter slides. What is the best plan to overcome this? A. Try two coats of paint without turpentine.

(7) A. F. says: I have had the walls in my house painted with oil color, and find that those parts from which the light has been excluded (by the hanging of pictures or other articles) have changed color to a yellowish tint. Is there a way of removing these stains? A. Peroxide of hydrogen and ozone have been recommended in such cases, but their application is difficult.

(8) O. P. asks: How many pounds to the square inch is atmospheric pressure? A. About 15. Is it possible to distinguish the electricity of iron, copper, brass, etc.? A. No.

(9) G. L. S. J. asks: 1. Which contains the most electricity, air or water? A. There is no practicable means of ascertaining. 2. What number of insulated copper wire would you use to wind magnets for a line of 3½ miles? A. No. 24 B. W. G. 3. What form of battery would you recommend for such a line, with ground plate for the return circuit? A. The gravity or Callaud.

(10) F. P. asks: 1. Will winter apples keep as well if grafted upon the stock of a fall apple as they will upon the stock of a winter apple? A. Yes. 2. I set the graft with the end of the grain of the graft meeting the side of the grain of the stock, or with the end of the grain of the graft meeting the end of grain of the stock. Which is correct? A. The latter.

(11) C. S. C.—Your boiler is too small. Plumbago and gas carbon are infusible.

(12) A. P. F. asks: If two engines and trains of equal weight and resisting power, both moving at the same speed, should approach each other upon a level track and collide, would either train prove a greater wreck than if, running at the same speed, it had impinged upon an immovable object? A. Either train would have the same effect upon the other as an immovable body; for the reason that, at the time of collision, the motion of each train would be instantaneously arrested. At all events, we are confident that the wreck would be quite as complete in one case as in the other.

(13) Inquirer.—The solid column of iron will support a greater load than the hollow column, both being of the same diameter.

(14) S. asks: 1. What are the dimensions of the drydock at the Brooklyn navy yard? A. It is 286 feet long and 30 feet wide at bottom; 307 feet long and 98 feet wide at top, with a lock chamber by which the length of the dock can be increased 52 feet. The bottom of the dock is 26 feet below mean high tide. 2. How long does it take to empty it? A. The dock, when filled by the tide, contains about 600,000 cubic feet, and the pumping engine can remove the water in 2 hours 10 minutes.

(15) J. F. M. asks: How much steam ought a horizontal boiler, shell ½ and heads ½ inch thick, single riveted, length 3 feet, diameter 22 inches, with a number of pipes connected to boiler for grate bars, and a dome 1 foot in diameter and 2 feet long, to carry? A. You can carry 130 lbs. steam; and then you can find out how fast your boat goes.

(16) R. B. C. says: I am building a propeller boat for towing, 60 feet long, 14½ feet broad, and 7 feet deep. I am going to put in a 16x16 inch cylinder, and want to make 150 revolutions per minute. What pitch ought I to have on a 6½ feet wheel? A. Make a true screw, pitch 8½ to 9 feet. We shall be glad to receive particulars of the performance of the boat.

(17) S. B. McC. asks: 1. What kind of coal is used in the foundry business? A. You can use charcoal, anthracite, soft coal, or coke. 2. How much iron would 1 ton of good coal melt? A. With hot blast, about 1 ton.

(18) C. M. B. asks: 1. What is an oscillating engine? A. One in which the cylinder swings during the revolution, the piston rod being connected directly to the crank pin. 2. What is the meaning of backlash in an engine? A. The striking of one connection against another, due to a stoppage or change of motion of one of the connections. 3. Why do all tugs use upright engines instead of horizontal ones? A. On account of the economy of space and the facility of arrangement, together with considerations of cost, weight, and durability.

(19) L. D. L. asks: What is the water pressure per square inch at the bottom of a pipe 100 feet in perpendicular height? A. About 43 lbs.

(20) J. K. asks: Please give me a rule for finding the wearing line of a saw tooth. What is the radius to be taken, in proportion to the diameter of saw? I want to lay it off for gumming the saw, and to have no further trouble. A. It will depend upon the form of teeth. Make a diagram of the saw, and continue the backs of the teeth, which will give you the lines required.

(21) E. S. M. says: I have a yawl 24 feet long by 5 feet beam, which I wish to propel at the rate of 6 or 7 miles an hour. What should be the dimensions of boiler, engine, and screw? A. Engine 3 by 5 inches, propeller 20 to 24 inches in diameter and of 2¾ to 3 feet pitch. Boiler 24 to 30 inches diameter, 3½ feet high.

(22) G. E. R. asks: In screwing gas or steam pipe, what number of threads are used for pipes of different sizes? A.

Inside diameter.	Threads per inch.	Inside diameter.	Threads per inch.
¾	27	1½	11½
1	18	2	11½
1¼	18	2½	8
1½	14	3	8
1¾	14	3½	8
2	11½	4	8
2½	11½		

Taper of threads, 1/16 per inch of length. These inside diameters are only estimated, as they vary for pipes of different strength, the thickness varying for the different grades, and the outside diameter remaining the same.

(23) P. R. says: 1. A friend states that the top of a chimney about 400 feet high will, in a severe storm, swing from 2 to 3 yards out of perpendicular. I say it is simply impossible. Which is right? A. It would be possible, but improbable. 2. My friend also says that, somewhere in Europe, there are very tall towers or chimneys considerably out of perpendicular. Is this so? A. You doubtless refer to the leaning towers of Pisa and Bologna. The tower of Pisa is 315 feet high, and a plumb line from the top of the inclined side will meet the ground 12 feet 4 inches from the base. The tower of Bologna is 134 feet high, and a plumb line falls 9 feet 2 inches outside the base.

(24) G. L. R. L. asks: What would be a safe pressure for a boiler 9 inches high by 1 foot in diameter, with four 1 inch tubes, made of sheet copper 3/16 inch thick? A. From 15 to 20 lbs. per square inch.

(25) A. M. G. asks: What is meant by "a twin screw propeller"? A. Twin screw propellers are two propellers side by side. These propellers are commonly called twin screws. For information in regard to your other questions, you should consult some good treatise on the screw propeller, as their discussion would occupy too much space for these columns.

(26) H. K. asks: 1. Will a boiler 24 inches long, 15 inches in diameter, with 5 two inch return flues, produce steam enough to get the full working capacity out of a 1½x3 inches engine? A. Yes. 3. If the boiler were made of ½ inch copper, would it be strong enough to sustain 50 lbs. to the inch with safety? A. Do not run it above 40 lbs.

(27) R. A. P. asks: 1. I claim that the shorter an exhaust pipe is, the better for an engine running at 95 revolutions per minute; others claim that an exhaust one hundred feet high of 4 inches diameter to an engine 12x24, making 95 revolutions per minute (slide valve cutting off at ¾ stroke), would be beneficial. They claim that the steam passing through that length of pipe would produce a vacuum, and the steam would rush from beneath the valve to fill the same. Is this so? I claim that, if there be a partial vacuum, the exhaust produces it; and if we can produce a vacuum in that length of pipe, without loss of power, why not make use of all the exhausts that are puffing outside of our numerous manufactories? A. We doubt the formation of a vacuum in such a case.

(28) R. S. E. says: I want to make a piston to work inside a sheet copper cylinder, for holding oil, and I wish to have the piston move easily. What is the best material? A. Make it either of wood or metal, and pack it with hemp.

If I put a coiled cast steel spring in connection with a steam boiler, in the steam space, but not where the water can touch it, shall I run a risk of drawing the temper? A. The spring will retain its temper for some time under these circumstances, but not as long as under ordinary temperatures.

(29) C. B. D. asks: For an engine of 3 inches stroke and 2 inches in diameter, what size boiler will be necessary, and of what metal should it be? A. Make the boiler of wrought iron, 20 inches in diameter and 3 feet high.

(30) H. G. H. says: A steam gage is found by a test gage to show a pressure of but 130, when it should have shown 185 lbs. per square inch. Is it correct to say that the gage is 55 lbs. light or 55 lbs. heavy? A. The former would be the more correct of the two.

(31) S. M. asks: We run a 4½ horse power upright engine and boiler. Last winter we inserted a pipe to convey steam for heating purposes, and from it connected another pipe to heat water in a tank. We found it impracticable to run the engine and admit steam in this heating pipe at the same time, by reason of the water rising in the boiler and into the cylinder. What is the cause, and what the remedy? A. Either the steam room in the boiler is too small, or the connections are improperly made.

(32) A. P. asks: How can I deodorize kerosene oil? A. Digest the oil with a quantity of chloride of calcium reduced to a fine powder, at a temperature not exceeding 140° Fah. for several days. It should then be drawn off from the limey sediment and treated with a little carbonate of soda. The alkaline sediment should next be drawn off, and the oil washed with water.

How is dammar varnish made? A. It is formed by dissolving gum dammar in oil of turpentine. Can the coloring matter called reginine be obtained? A. Yes, in the shops.

(33) T. M. C. asks: What is the best remedy to prevent unpleasant odors from the feet caused by perspiration? A. Use carbolic soap.