

Business and Personal.

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

To Village Authorities and Others, who desire, by the Establishment of a Hardware Manufacturing Company...

Wanted—A Rotary Veneer Cutting Machine. Address, with particulars, and state lowest cash price...

How I turned \$250 into more than \$1,000 and expense, in four months. Patented in U.S. and Canada.

Persons Interested in the Manufacture of Gas for Illuminating from Petroleum Oil, please correspond with Box 282, Cuba, N. Y.

Hickory and Honey Locust buggy posts, best quality and common, Hickory for shafts, bellows handles, &c., very low.

Wanted—A Machinist, Moulder and Boiler-maker, to act as Superintendent and Foreman of a Foundry and Machine Shop.

Second Hand Car Wheel Press for Sale—Price \$175. E. L. Kinsley, Cambridgeport, Mass.

Agency in Boston Wanted—First-class Bonds will be furnished. T. Ray, P. O. Box 1268, Boston, Mass.

Washing Machine Dealers and others can buy the first class self-adjusting Crown Wringers...

Steam Yacht for Sale 60 ft. long 25 horse engine. Beautifully fitted up.

Catalogue on Transmission of Power by Wire Rope. T. R. Bailey & Vail.

Buy Boul's Pat. Molding and Dovetailing Machine, for all kinds edge and surface molding.

Best Steam Fire Engine or Hook & Ladder Signal Lamps. Apply to White Mfg Co., Bridgeport, Ct.

The New Elastic Truss presses uniformly all around the body, and holds the rupture easy, night and day, till cured.

A Condensed Treatise on Silicate or Soluble Glass just published and mailed free on receipt of \$1.

Chemicals of all kinds for all trades made to order at our own Laboratory by addressing L. & J. W. Feuchtwanger, 55 Cedar street, N. Y.

The Olmsted Oiler is the best; it is self-righting, strong and cheap.

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent.

Key Seat Cutting Machine. T. R. Bailey & Vail.

Portable Hoisting and Pumping Engines—Ames Portable Engines—Saw Mills, Eggers, Burr Mills, Climax Turbine, Vertical and Horizontal Engines and Boilers...

Buy Gear's Improved Variety Moulding Machine. Ware Rooms, Boston, Mass.

Lathes, Planers, Drills, Milling and Index Machines. Geo. S. Lincoln & Co., Hartford, Conn.

Williamson's Road Steamer and Steam Plow, with rubber tires. Address D. D. Williamson, 32 Broadway, New York, or Box 1809.

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

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

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

Five different sizes of Gatling Guns are now manufactured at Colt's Armory, Hartford, Conn.

Machinists—Price List of small Tools free; Gear Wheels for Models, Price List free; Chucks and Drills, Price List free.

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

Gear, Boston, Mass., sells Machines and Supplies of all kinds.

Bookkeepers should try the Olmsted Patent Bill File and Letter Clip.

Hydraulic Presses and Jacks, new and second hand. E. Lyon, 470 Grand Street, New York.

Bolt Makers, send for descriptive cuts of Abbe's Bolt Machine, to S. C. Forsyth & Co., Manchester, N. H.

Root's Wrought Iron Sectional Safety Boiler. 1,000 in use. Address Root Steam Engine Co. 2d Avenue and 28th Street, New York.

Boring Machine for Pulleys—no limit to capacity. T. R. Bailey & Vail, Lockport, N. Y.

Brown's Coal-yard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable.

The Best Smutter and Separator Combined in America. Address M. Deal & Co., Bucyrus, Ohio.

Damper Regulators and Gate Cocks—For the best, address Murrill & Kelzer, Baltimore, Md.

Lightning Mill for Sale—A Walker Bros. Percussion Mill for pulverizing hard substances.

Steam Fire Engines, R. J. Gould, Newark, N. J.

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

Gauge Lathe for Cabinet and all kinds of handles. Shipping Machine for Woodworking. T. R. Bailey & Vail, Lockport, N. Y.

Notes & Queries

E. M. McD. & Bro. ask: What will dry and harden black paint for use on a carriage?

G. G. asks: Can a pine tree be grafted, and if so, with what kinds of trees? Which is the most suitable time to transplant a locust tree, and to cut it down, for the preservation of the wood?

H. D. A. asks: What can I use to stain the unpolished part of tools? Japan will not answer.

T. M. Jr. asks: How can I preserve grapes in the bunch, fresh as when taken from the vine?

P. T. says: I hear that water used in steam boilers will not go as far in hot dry weather as in cold damp weather; in other words, that a boiler will use a great deal more water to make a given amount of steam in dry weather than in wet weather.

F. G. asks: What effect has Portland cement upon coal tar and pitch? Would a dry mixture of 6 parts coarse sand and one part of Portland cement, stirred into boiling tar or pitch, make a better concrete than the sand and cement alone, when elasticity was an object?

P. H. asks: What is the best thing to clean brass on fine toilet boxes?

S. S. asks: How can I mend a glass vase? It is cracked for the distance of 3 to 4 inches and lets in the dust.



L. K. can find Kepler's laws in any book on astronomy.—W. T. W. should read this journal regularly, and would not then ask a question which we have repeatedly answered in the last few weeks.

R. S. B.'s specimen of leather has the plain color given by the bark, and is not dyed at all.—T. G. A. can water-proof and fireproof wood by using the process described on p. 280, vol. 28.—S. P. P. had better try the method mentioned on p. 406, vol. 25, for preserving eggs.—O. B. and C. G. H. Jr. will find the cement for leather on p. 119, vol. 28.—E. F. B. can clean his zinc bath tub with soap, a scrubbing brush and elbow grease.—C. H. can attach rubber to brass by following the directions for flannel on iron, on p. 107, vol. 28.—E. B. can make printers' rollers by melting together glue and molasses to the proper consistency, and casting in a mold.—S. E. H. can cement wood to glass by using plaster of Paris.

A cheap book on mechanical plan drawing is reviewed on p. 376, vol. 28.—J. S. H.'s query belongs properly to mensuration, and he had better read up that subject.—P. B. will find his query as to the effective weight of a safety valve lever answered in an article which will shortly be published.—J. A. H. will find recipes for colored fires on p. 165, vol. 24.

G. W. I. asks: How many cubic feet will a boiler of 1 horse power heat to 60°? [Answer: About 140, if your question refers to air.]

M. R. asks: Which describes the largest circle, the bow or the stem of a ship or boat when she is going ahead with the helm hard over? In other words, which end goes off endways the most? Answer: This will probably remain an open question until some careful experiments are made.

H. K. says: Upon a shaft are keyed two wheels, namely, a belt pulley and a gear wheel, both of the same diameter. The gear wheel drives a breaker, and receives very heavy jars. Question is: How much lighter dare I make the arms of a pulley than those of the gear wheel? The pulley drives the shaft.

J. H. F. asks: Can some one give me directions how to carburet pure hydrogen gas made by the action of sulphuric acid on zinc scraps? Answer: Pass the hydrogen gas through spirits of turpentine, benzine, or naphtha. The hydrogen in this case does not chemically combine with the carbon in the turpentine, etc., but carries off, mechanically suspended in it, a certain portion of the volatile hydrocarbon.

J. B. asks: What is the best and cheapest process of bronzing some small articles made of iron wire? Answer: Clean the wire perfectly, and then immerse it in a solution of sulphate of copper (blue vitriol) until covered with a coating of metallic copper. Then wash and immerse the articles in the following solution: Verdigris 2 ounces, sal ammoniac 1 ounce, vinegar 1 pint, diluted with water until it tastes only slightly metallic, then boiled for a few minutes and filtered.

J. T. D. asks: 1. What is the cause of the pieces of lumber clattering and inclining to raise up back of the saw when pushing hard against it? 2. What is the proper angle for saw teeth; or in other words, how much hook should a saw tooth have? Our saws vary from 8 inches to 18 inches diameter.

F. L. R. asks: What will cement meersch-schaum? Answer: Make fine freshly calcined plaster of Paris into a cream with water, by sifting or dusting the plaster into the water, and apply as a cement to the broken parts. It sets in a few minutes, but takes a few days to become dry. It is fireproof.

J. I. asks: Is there a way to dissolve or disintegrate burnt clay, which, in hardness and cohesion, is about the same as a soft burnt brick? Hydrofluoric acid is too expensive; caustic potash or soda is too slow; heating and quenching in water is not effectual; sulphuric or other acid softens but does not dissolve or cause crumbling. Answer: If your clay were not burnt so hard, sulphuric acid would effectually dissolve it, as these are the materials used in the manufacture of what is known as aluminous cake.

D. J. G. asks: How bones are treated before being ground into flour for fertilizing purposes? Answer: Expose the bones to the air and heat of the sun until hard and dry; then crush and grind.

W. C. D. asks: 1. Can you give me a receipt for making a hard white enamel? 2. Can you give me directions for putting the above enamel on a brass plate, making a good clear enamel? Answer: 1. Take tin 3 parts, lead 10 parts, mix; calcine in an iron pot at dull red heat, and scrape off the oxide as it forms, keeping it free from metal. Reduce this oxide to fine powder by grinding and elutriation. Take 1 part of this fine oxide, fine crystal glass 2 parts, manganese a few grains; powder, rinse, melt and pour fused mass into water, and repeat this process of powdering and melting, etc., 3 or 4 times. This powder is finally fused on the surface of the polished brass, either by the blow-pipe or the heat of a small furnace.

R. C. G. says: I want to construct an engine for a boat 20 feet long by 4 feet beam, and to occupy as little room (with boiler and fuel) as possible. I propose to put in an oscillating engine 6 x 6 to make 200 revolutions per minute, geared to screw shaft, also to use a jet condenser, with a boiler of 20 square feet of heating surface. Please give me your opinion as to the practicability of the plan. Answer: The engine is probably larger than you need, and we think the boiler is too small for the proposed engine.

C. F. C. says: 1. I have a vertical engine of 5 1/2 inches diameter x 6 inches stroke, and a boat 25 feet long x 6 feet beam. I propose to use the engine to drive the boat with a three blade propeller of 20 inches diameter. Please tell me what are the proper dimensions of a vertical tubular boiler sufficient to drive it. Answer: You do not give sufficient data, but we can probably furnish you with figures by means of which you can answer the question for yourself. Calculate the power your engine is to develop, and allow about one square foot of grate surface, and from 18 to 20 square feet of heating surface, for each horse power.

S. asks: Can you give me a formula for a gall ink which will write black when first exposed and retain its fluidity after being exposed to the air? 2. What work on fermentation and its preventives should you recommend? 3. What practical work on chemistry as applied to the arts and sciences is the best? Answer: 1. You can make an ink which will write black at once by using white coppers instead of the ordinary kind, and by leaving the infusion of galls to itself some time before mixing. Here is a recipe: Galls, 125 parts, white coppers, 24 parts, gum arabic, 24 parts, water, 827 parts, in all 1,000. 2. Dussauce on "Vinegar." 3. Bloxam's is very highly spoken of.

M. T. asks several questions as to water supply for a town. Answer: These are professional questions, the solution of which you should entrust to some reliable and competent engineer. A small outlay incurred for a thorough report will more than repay you.

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F. A. asks: 1. What amount of fall would a stream of water conducted by a one inch pipe require to produce one horse power by a suitable wheel? 2. Would a 2 inch pipe with one half the fall give the same power? 3. How can I harden copper and bronze? Answer: 1. A horse power would be produced by the fall of one pound of water for a distance of 33,000 feet in a minute, or by producing an effect of 33,000 foot pounds. 2. You can calculate the discharge of water from pipes of different diameters, by means of the formulas given in the article on "Friction of Water in Pipes" (page 48, present volume of the SCIENTIFIC AMERICAN), and thus ascertain the amount of fall required. 3. Copper and bronze can be hardened by heating them and allowing them to cool slowly.

G. P. A. says: 1. In raising and setting a pair of steamboat shafts, open on the bottom center and on the after half center, I contend that the shafts out boards must go back and be lowered to bring them right. Am I right? 2. What is the rule for raising shafts, how much to a foot, and what must be taken off the length of the cranks? Answer: 1. The outboard ends of the shafts should be lowered, and should go back, if the cylinder is forward of the shaft. 2. To find how much the outboard end of the shaft must be lowered, measure the throw of the crank, the length of the shaft from face of crank to center of outboard bearing, and the amount the cranks have opened at the bottom center (or the difference of distances between cranks measured at center of shafts and center of crank pins), all in inches. Multiply the length of the shaft by half the opening of the cranks, and divide by the throw of the crank. The result will be the amount that the outboard shaft must be lowered.

A. R. S. asks: Is there any method, either with or without instruments, by which in a few moments I can measure land, in plots of from 50 to 640 acres, with tolerable accuracy? Answer: No.

shingles, etc., even from soft wood, one quarter pitch is best. 3. 9,000 feet per minute is the usual rule for the rim of a circular saw to travel; this speed a 12 inch saw 3,000, a 24 inch 1,500, a 36 inch 1,000, a 60 inch 600, etc. Taper ground saws nicely balanced with collars attached to them, like shingle saws, may be run at higher speed with safety, say 13,000 feet per minute.—J. E. E., of Pa.

W. H. P. asks: How can I polish mineral specimens? Answer: The easiest way for you is to first grind the stones on the grindstone to the shape required, and then to smooth with emery, finishing by polishing with rottenstone.

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A. R. S. asks: Is there any method, either with or without instruments, by which in a few moments I can measure land, in plots of from 50 to 640 acres, with tolerable accuracy? Answer: No.

A. B. says: What kind of a cable would be best, a chain, a wire rope, a common rope, or a tarred rope, to be used on a hoisting machine, exposed to the weather and in use every day, where the cable is required to raise a weight of 1,200 or 1,500 lbs. a distance of 20 feet and return every two minutes, running over two pulleys and winding up on a drum? What size should the rope be? Answer: If the drum is of good size, wire rope, five eighths of an inch in diameter, will probably give better satisfaction than a chain or hemp rope.

B. S. E. asks: 1. What should be the dimensions of the boiler of an engine 1 1/2 inches bore x 2 inches stroke? Of what metal can it be most conveniently constructed? 2. What are the formulae for the fly wheel and the safety valve? Answer: You will find answers to both these questions by consulting recent back numbers of our paper.

F. N. asks: 1. Why does the water in a boiler rise when the throttle is opened, and why does it rise more in one locomotive than in another? 2. When a locomotive is running at 16 miles an hour and is at once reversed, where is the pressure on the valves (top or bottom side) to cause the reverse lever to want to fly back to where it was before she was reversed? 3. Will an engine working pretty hard use as much water with 150 lbs. of steam as with 100 lbs.? Answer: 1. Because the pressure is relieved. If there is such difference as you state between the two boilers, it is probably on account of the different steam space in each. 2. If such action does occur, it may be due to the motion of the engine, which cannot be stopped at once; in which case the pressure will be under the valve. 3. Generally not.

O. G. says: 1. The supply pipe to a boiler and the waste water pipe from a heater are two inches in diameter, and were put in new two years ago; they are now nearly closed up with lime. Is it possible that I can take the lime out of them, or not? 2. Are all steamers in the United States subject to the Government inspection or not? I own a tow boat and do not go into any port of entry with her, either in this State or out of it. Answer: 1. Possibly you may be able to remove the incrustation by the use of some of the scale preventives in the market. 2. We think not.

J. H. asks: 1. Please give an illustration and description of an injector as used to supply boilers with water. 2. Suppose an engineer on board a steam boat is caught with low water, hot fire, feed pump out of order, steam rising, and it is desired of him to keep running, how can he get out of the difficulty without hauling the fire? Can he keep the machinery running? Answer: Write to the manufacturers and you can obtain a full description. 2. Engineers do sometimes try to keep the machinery in motion, under such cases, and almost invariably burn the iron of the boiler.

T. C. W. asks: Can a locomotive push a passenger train as well as it could pull it? Answer: Yes. But the engineer is unable to see the track or control the train very well when going backward, and it is considered unsafe.

C. K. asks: Can you give directions for making what is known as the water blast, that is, a draft of air driven by a direct action of water? Answer: You will find a diagram and description of this device in Science Record for 1873, p. 285.

C. M. N. asks: How can sal ammoniac and nitrate of silver be precipitated? Answer: We know of no method of precipitating these soluble salts.

J. G. T. says: I have a pulley 8 inches diameter with groove cut for 1/2 inch round belt; required the diameter of small pulley to make 4 1/2 revolutions to one of the 8 inch pulley. Answer: Take for the radius of the pulley, the distance from center of pulley to center of belt when placed in groove, and make the calculations as before. Strictly speaking, even in the case of a flat belt, the working radius should be the same, namely, distance from center of pulley to center of belt, so that diameter equals diameter of pulley plus thickness of belt. In practice, the thickness of belt, unless very great in comparison with the diameter of the pulley, may be neglected without much error.

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