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 Employing at present about forty hands, to improve their village and enhance the value of their Real Estate by donating suitable land and buildings, and to communicate, stating the size of the building offered and the amount of Stock they would subscribe for. The present Capital of the Company is \$40,000. The size of the building required, about 50x100 ft., two stories. The ocation preferred, New York State, in the vicinity of Stream, Lake or Pond. Address Box 3131, P.O., New York. Wanted—A Rotary Veneer Cutting Machine. Address, with particulars, and state lowest cash price, "Veneers," 199 Centre Street, New York.

How I turned \$2.50 into more than \$1,000 and expense, in fourmonths. Patented in U.S. and Can

ada. Manufacturing partners and agents wanted. A household necessity. W. T. Bunnell, Ottawa, Ontario, Canada.

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Hickory and Honey Locust burgy posts, best quality and common, Hickory for Shafts, Feilors Handles, &c., very low. Also, White Walnut Lumber. Address Chestnut & Co., Waverly, Chio. Cabinet Makers' Machinery. T.R.Bailey&Vail.

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Washing Machine Dealers and others can buy the first class self-adjusting Crown Wringers lower than other good Wringers. Address, for Circular, &c.,

Am. Mach. Co., 430 Walnut St., Philadelphia, Pa. Steam Yacht for Sale 60 ft. long 25 horse engine. Beautifullyfitted up. Address H.L. R. 40 West 18th St. New York.

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

Buy Boult's Pat. Molding and Dovetailing Machine, for all kinds edge and surface molding. Bat-tle Creek Machinery Company, Battle Creek, Mich.

Best Steam Fire Engine or Hook & Ladder Signal Lamps. Apply to White M'rgCo., Bridgeport, Ct. The New Elastic Truss presses uniformly all around the body, and holds the Rupture easy, night and day, till cured. Sold cheap by the Elastic Truss Co.. 683Broadway, New York.

A Condensed Treatise on Silicate or Soluble Glass just published and mailed free on receipt of \$1. L. & J. W. Feuchtwanger, 55 Cedarstreet, N. Y.

Chemicals of all kinds for all trades made to order at our own Laboratory by addressing L. & J

W. Feuchwanger, Chemiste, 55 Cedarstreet, N. T. The Olmsted Oiler is the best; it is self-righting, strong and cheap. All Hardware and Tin Houses have it.

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Key Seat Cutting Machine.T.R.Bailey & Vail. Portable Hoisting and Pumping Engines-Ames Portable Engines-Saw Mills, Edgers, Burr Mills, Climax Turbine, Vertical and Horizontal Engines and Bollers; all with valuable improvements. Hampson, Whitehill & Co., Newburgh Steam Engine Works, Depot 38 Cortlandt Street, New York.

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 Broad-way, New York, or Box 1809. For Solid Emery Wheels and Machinery, nd 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 Bliss & Williams. cor. of Plymouth & Jay, Brooklyn, N.Y. Stave & Shingle Machinery. T.R.Bailey & Vail.

Five different sizes of Gatling Guns are now manufactured at Colt's Armory, Hartford, Conn. The larger sizes have a range of over two miles. These arms are indispensable in modern warfare.

Machinists—Price List of small Tools free; Gear Wheels for Models, Price List free; Chucks and Drills, Price List free. Goodnow & Wightman, 23 Cornbill. Boston. Mass.

For Solid Wrought-iron Beams, etc., see ad-vertisement. 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. They are admirable for all papers. Save their cost in one day's business. Sold by all ers. J.H. White Newark N . .Sole Manufacturer



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

G. G. asks: Can a pine tree be grafted, and so, with what kinds of trees? Which is the most suitble 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 inpolished 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. Is it so? [This is a subject rather new to us, and we would be glad to hear from others of our readers on the matter.-EDS.]

F. G. asks: What effect has Portland ce-ment upon coal tar and pitch? Would a dry mixture of 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? Is sand, highly impregnated with iron (so much so as to be discolored and lumpy) a good ingredient for cement concrete? Would it make the concrete harder and more enduring?

P. H. asks: What is the best thing to clean orass 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 reg-ularly, 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 print-ers' 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 nensuration, 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 care ful experiments are made. It would seem likely that with screw propellers, all turn on different points, and slightchanges of rig or load may vary these points in any particular case.

H. K. says: Upon a shaft are keyed two wheels, namely, a beit 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. 2. What are the proper proportions of arms for pulleys and gears? Haswellgivesproportions for gear wheels, but does not take the width of face into consideration. Is not that an important omission? Answers: 1. Divide the whole strain received by the pulley among the num-ber of arms, and proportion them accordingly. 2. The arms of a gear wheel ordinarily require to be about twice as strong as those of a pulley which transmits power by a belt, owing to the different ways in which the strain acts in the two cases.

J. H. F. asks: Can some one give me direc-tions 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 chem-ically 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 imuntil 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. The articles of wire are steeped in this liquor at the boiling point, until the desired effect is produced; but do not keep them in too long. When taken out, wash carefully in hot water and dry.

shingles, etc., even from soft wood, one quarter pitch is best. 3. 9,000 feet per minute is the usual rule for the rimof a circular saw to travel ; this speeds 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 withsafety, say 12,000 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.

F. L. R. asks: What will cement meer-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 dis-integrate burnt clay, which, in hardness and cohesion, is about the same as a soft burnt brick? Hydrofiuoric 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 s known as aluminous cake. As chemical means have failed, however, we would suggest mechanical ones, in the shape of the pickaxe and hammer.

D. J. G. asks: How bones are treated be-fore being ground into fiour 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 re-ceipt 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? Answers: 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 find powder by grinding and elutriation. Take1 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 melt-ing, 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 revolu tions 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 prac-ticability of the plan. Answer: The engine is probably larger than you need, and we think the boller is too small for the proposed engine.

C. F. C. says: 1. I have a vertical engine of 5% inches diameters 6 inches stroke, and a bat 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 diame-ter. Please tell me what are the proper dimensions of a vertical tubular boller sufficient to drive it. Answer: You do not give sufficient data, but we can probably fur-nish you with figures by means of which you can answer the question for yourself. Calculate the power your engine is to develope, 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 workon fermentation and its preventives should yourecommend? 3. What practical work on chemistry as applied to the arts and sciences is the best? Answers You can make an ink which will write black at once by using white copperas 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 copperas, 24 parts, gum arabic, 24 parts, water, 527 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 upplyforatown. 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.

E. E. P. asks: What will remove grease and dirt from parchment, and not disfigure the written or printed matter? Answer: We think you can restore the parchment to its fornier appearance by the use of concentrated benzine.

C. H. asks: 1. How much power can I re-alize from a steam pipe 3% of an inch in diameter with a pressure of 10 pounds only? 2. How should such an enginebe constructed? Answers : 1. Consult our article on the "Efflux of Steam," page 113, current volume. 2. You will find rules on this subject, in answer to former inquiries.

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? An-swers: 1. A horse power would be produced by the fall of one pound of water for a distance of 33,000 feet in a merse it in a solution of sulphate of copper (blue vitriol) minute, or by producing an effect of 33,000 foot pounds. ou 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 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 gobackand belowered 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 for the length of the cranks? Answers: 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 byhalf 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. B. says: What kind of a cable would be best. a chain, a wire rope, a common rope, or a tarre 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 di-mensions of the boiler of an engine 1% inches bore x 2 inches stroke? Of what metal can it be most conveniently constructed? 2. What are the formulæ for the fly wheel and the safety valve? Answers: 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. ? Answers : 1. Because the pressure is relieved. If there is such difference as youstate 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 Govern-ment inspection or not? I own a tow boat and do not gointo any port of entry with her, either in this State or out of it. Answers: 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? Answers: Write to the manufacturers and you can obtaina 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 assenger train as well as it could pull it? Answer: Yes. Butthe engineer is unable to see the track or control the trainvery well when goingbackwards, and it is considered unsafe.

C. K. asks: Can you give directions for aking 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 di-ameter with groove cut for ¼ inch round belt; required the diameter of small pulley to make $4\frac{1}{2}$ 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 fiat 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 thickvery great in comparison with the diameter of the pulley, may be neglected without much error.

COMMUNICATIONS RECEIVED.

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

On Ships on Fire. By M. S. On the Devil Fish. By G. A. P. On Squaring the Circle. By -On the Lourdes Miracles. By ----On the Million Dollar Telescope.

Bу D. W. M. & Co.

On Blasting in a Coal Mine. By C.M.

On the Patent Right Question. By A. B. F.

On an Ocean Railway. By C. A. B.

On Church Clocks and Chimes. By W.M.

On Toads in Rocks. By W. A. A. On Jumping from Railway Trains. By

B. T. On the Zodiacal Light. By A. D.

On Aeronautics. By M. B.



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

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

Root's Wrought Iron Sectional Safety Boiler. 1000 in use. Address Root Steam Engine Co. 2d Avenue and 23th Street, New York.

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

Brown's Coalyard Quarry & Contractors' Apparatus for hoisting and conveying material by iron cable W.D. Andrews & Bro. 414 Waterst.N.Y.

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

Damper Regulators and Gage Cocks-Fo ne best, address Murrill & Keizer, Baltimore, Md.

Lightning Mill For Sale—A Walker Bros. Percussion Mill for pulverizing hard substances. Thos Waring & Bro., Colora, Cecil Co., Md.

SteamFire Engines, R.J.Gould, Newark, N.J.

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

(Hauge Lathe for Cabinet and all kinds of han-tles. Shaping Machine for Woodworking. T. R. Batley & Vail, Lockport, N. Y.

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 pushinghard 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 Sinches to 19 inches diameter. 3. Howfast should aws of these diameters run on one arbor? Answers: 1. We presume that you mean small circular saws from 8 to 20 inches in diameter, known as bench saws and sawing by a gage. The back half of the saw, having an upward motion, has a tendency to lift and raise the piece being sawn, especially when it springs and pinches on the saw or crowds between the saw and gage ; while of holding that part of the piece down; this would cause the niece to tremble. 2. The book or nitch of the tooth hould be on a line to from one fourth to one fifth the diameter of the saw : a one fourth pitch is mostly used for hard and one fifth for softer timber. For very fine toothed saws, designed for heavy work, such as sawing

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.

Also enquiries from the following :

J. B.A.-J. C. L.-W. C. B.-A. J. B.-J. M.-R. W.-T. C. S.-J. M. H.-D. M. G.-R. B. M.-R. L. & S. Co -0.8 - W.8 - E. M. D - W. T - A. B. W - R - H. G.

Correspondents who write to ask the address of certain nanufacturers, or where specified articles are to be had, also those having goods for sale, or who want to find partners, should send with their communications an amountsufficient to cover the cost of publication under the head of "Business and Personal," which is specially levoted to such enquiries.

Correspondents in different parts of the country ask Where can machinery for boring wells be obtained? Who makes ore crushers? What is the cost of a brick compressing machine? Who makes egg beaters, and what is the wholesale price? Who makes egg ocaters, and Who makes jig saws? Where can I get a cabinet maker's work bench? Who makes the best pick with a changeable point for miner's use? Where can I get a machine for cutting splints for lighting cigars, etc.? Where can I find a hand power drill that will do the work of 8 or 10 men? Which is the best brickmaking machine? Who has for sale a peat compressing patent? Where can I obtain a machine for splitting match wood? Where can diamonds suitable for dressing millstones be obtained? Who makes stave cutting machines? Makers of the above articles will probably promote their interestsby advertising, in reply, in the SOLENTIFIC AMER-JCAN.