

Business and Personal.

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I claim to have discovered a method of squaring the circle mathematically, and I am ready to give a mathematical proof of it to any person or institution who will secure to me a reasonable sum of money after the proof has been accepted by a Committee of Scientific Men. Jas. Forward, Alton, Columbia Co., Wis.

To Manufacturers of Fertilizers—James Codville's Seeder and Fertilizer sows 150 Bushels per day, Ashes, Plaster, Lime, &c. Secure the right for your State, and double your business. Address James Codville, Woodstock, Ontario, Canada.

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Ice Machines—Price wanted of Ice Machines from Manufacturers. Address H. H., Box 3573, N. Y. city.

The only practical Metallic Sleigh Stud ever made is now being extensively used and sold by the patentee. Hugh Smith, Gray, Maine.

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For Inventors—A Practical System for the Sale of Patent Rights. Approved by "Scientific American" and the "American Artizan." Tells how to make money on Patents. Send for explanatory circular, S. S. Mann & Co., Baltimore, Md.

Thirty-seven volumes of the Scientific American, from 1835 to date, for Sale; also a lot of Patent Office Reports. Address Mrs. Slayton, 708 Third Ave., New York.

Matson's Combination Governor is sent on trial to any one addressing Matson Bros., Moline, Ill.

Astronomical Telescopes, Spy-Glasses, and Optical Instruments at prices to suit all. L. W. Sutton Manufacturer, Warren St., Jersey City, Box 218.

For the Best Portable Engine in the world, address Baxter Steam Engine Co., 18 Park Place, N. Y.

Magic Lanterns and Stereopticons for Public Exhibitions, Street Advertising, &c. Catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Saw Ye the Saw?—\$1,000 Gold for Sawmill to do same work with no more power Expended. L. B. Cox & Co., 197 Water St., New York.

Eames Patent Molding Machines for Metal Castings. Saves fully one third in cost of labor of molding, and secures better work than the ordinary method. For Circulars, address P. & F. Corbin, New Britain, Conn.

Small Portable Engines, 2 to 12 H.P. Send for Prices & Catalogue. Tully & Wilde, 20 Platt St., N. Y.

For Sale, Cheap—2nd hand 13 H. P. Engine and Boiler. Terms easy. E. F. Mallory, W. Springfield, Erie Co., Pa.

To Manufacturers:—I have just patented a simple and powerful hand lever metal working machine, of seven tools in one combination. Just the tool for Blacksmiths. Territory for sale, or to let on royalty. Address George L. Jones, Vanville, Wisconsin.

18x42, 16x36, 14x30, 12x24, 12x30, 11x14, 11x24, 10x12, 10x15, 10x20, 9x12, 9x16, 8x12, 8x16, 8x20, 7x12, 7x16, 7x20, 6x6, 6x12, 5x11, 4x6, 4x8, 3x6, 8x9 Engines, and 25 others, rebuilt and warranted reliable. Loco., Flue, Up., and Horizontal Tubular Boilers, new and 2d hand. Steam and Belt Pumps, and miscellaneous machinery, at reasonable prices. Wilson & Roake, Water and Dover Sts., New York.

Metallic Roofing—The patent issued Sept. 1st, to the subscriber, describes and protects a very superior roofing. For the introduction, use, and sale of which, address Seth Cox, Oskaloosa, Iowa.

Best Philadelphia Oak Belting and Monitor Stitches. G. W. Army, Manufacturer, 301 & 303 Cherry St., Philadelphia, Pa. Send for new circular.

Direct Steel Castings—Solid and Homogeneous. Cohesive Power four times greater than Cast Iron. An invaluable substitute for expensive forgings, or Iron Castings requiring great strength. For circular and price list, address McHaffee Steel Co., cor. Evelina and Levant Sts., Philadelphia, Pa.

Steel Lathes Dogs, 14 sizes, and 7 sizes of Steel Clamps. The Best and Cheapest. Send for Circular & price list to Phila. Hydraulic Works, Evelina St., Phila.

Shafting, Pulleys, and Hangers at the lowest prices. D. Frisbie & Co., New Haven, Conn.

100,000 Standard Receipts, selected from the best Authorities. Anyone receipt sent for 30 cts., two for 50 cts., five for \$1. Money refunded if receipts do not give satisfaction. Address Burt & Co., Watertown, N. Y.

For Durkee Saw Mills, address the Manufacturers, T. R. Bailey & Vall, Lockport, N. Y.

Wanted, the Management and Manufacture in England of American Inventions that have been introduced in America and are patented in England. Machinist and Engineering Tools preferred. Address Wm. Horsfall, 123 Atlantic Ave., Brooklyn, N. Y.

Johnson's Universal Lathe Chuck. Address Lambertville Iron Works, Lambertville, N. J.

The Lane Mfg Company, Montpelier, Vt., will exhibit Circular Saw-Mill, Rotary Bed Surfacer, and Clapboard Planer, at Fair of the Mass. Char. Mech. Association, Boston, Sept. 16 to Oct. 7. Sample machines may also be seen at W. L. Chase & Co.'s, 95 Liberty St., New York City.

Double Belts and Rubber Springs specially for Centrifugal Machines. Greene, Tweed & Co., 28 Park Place, New York.

Tingue, House & Co., 69 Duane St., N. Y. Manufacturers of Machine Blanketing, Felts, and Cloths Endless or in piece, for Printers, Engravers, Polishers Piano Forte Makers, Paper Makers, Calico Printers Punching or Washer Cloth, Filter and Strainer Cloths for all kinds of liquids. Sample sent on application.

Double-Acting Bucket Plunger Steam Pumps, Manufactured by Valley Machine Co., Easthampton, Mass N. Y. Store, 45 Cortlandt St.; Phila. Store, 132 N. 3rd St.

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

Deane's Patent Steam Pump—for all purposes—Strictly first class and reliable. Send for circular. W. L. Chase & Co., 95 & 97 Liberty St., New York.

Inventors can get small plates of sheet steel very cheap, at the saw factory, 118 Hester St., New York.

Best Oak Tanned Leather and Rubber Belting. Greene, Tweed & Co., 18 Park Place, New York.

Diamonds and Carbon turned and shaped for Scientific purposes; also, Glaziers' Diamonds manufactured and reset by J. Dickinson, 64 Nassau St., N. Y.

Baxter's Adjustable and S Wrenches by the Case. Greene, Tweed & Co., 18 Park Place, New York.

Electric Bells for Dwellings, Hotels, &c.—Most reliable and cheapest Hotel Annunciator. Cheap telegraph outfits for learners. Inst's for Private Lines, Gas Lighting Apparatus, etc. J. H. Hessin, Sc. Cleveland, O.

Pattern Letters and Figures, to put on patterns of castings, all sizes. H. W. Knight, Seneca Falls, N. Y.

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

Mining, Wrecking, Pumping, Drainage, or Irrigating Machinery, for sale or rent. See advertisement. Andrew's Patent, Inside page.

Automatic Wire Rope R. R. conveys Coal Ore, &c., without Trestle Work. No. 34 Dey street, N. Y.

A. F. Havens Lights Towns, Factories, Hotels, and Dwellings with Gas. 34 Dey street, New York.

Temples & Oilcans. Draper, Hopedale, Mass.

Buy Boulton's Paneling, Moulding, and Dovetailing Machine. Send for circular and sample of work. B. C. Machy Co., Battle Creek, Mich., Box 227.

Rue's "Little Giant" Injectors, Cheapest and Best Boiler Feeder in the market. W. L. Chase & Co., 95, 97 Liberty Street, New York.

For Surface Planers, small size, and for Box Corner Grooving Machines, send to A. Davis, Lowell, Mass.

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

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

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

Price only three dollars—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., 263 Broadway, New York.

All Fruit-can Tools, Ferracuts, Bridgeton, N. J. Peck's Patent Drop Press. For circulars, address Milo, Peck & Co., New Haven, Conn.

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

The French Files of Limet & Co. are pronounced superior to all other brands by all who use them. Decided excellence and moderate cost have made these goods popular. Homer Foot & Co., Sole Agents for America, 20 Platt Street, New York.

The Improved Hoadley Cut-off Engine—The Cheapest, Best, and Most Economical steam-power in the United States. Send for circular. W. L. Chase & Co., 95 & 97 Liberty St., New York.

Telegraph Inst's. M. A. Buell, Cleveland, O.

Compound Propeller Pumps, for Mines, Quarries, Canals, and Irrigating purposes. Circulars on application to Hydrostatic and Hydraulic Company, 913 Ridge Avenue, Philadelphia, Pa.

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

Portable Engines, new and rebuilt 2d hand, a specialty. Engines, Boilers, Pumps, and Machinist's Tools. I. H. Shearman, 45 Cortlandt St., New York.

Spinning Rings of a Superior Quality—Whitinsville Spinning Ring Co., Whitinsville, Mass. Send for sample and price list.

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

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

Forges—(Fan Blast), Portable and Stationary. Keystone Portable Forge Co., Philadelphia, Pa.

Brown's Coal-yard Quarry & Contractor's Apparatus for hoisting and conveying materials by iron cable. W. D. Andrews & Bro., 414 Water St., New York.

Saws made & repaired at 108 Hester St., N. Y.

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 \$5. F. C. Beach & Co., 263 Broadway, New York, Makers. Send for free illustrated Catalogue.



(1) J. M. says: We have attached to pipes laid in our streets for fire purposes, a steam pump, which takes water only on the upward stroke. The diameter of the water cylinder is 10 inches, and the length of stroke is 6 inches. The supply comes from a pond which is 430 feet distant, and the surface of the water is 15 feet below where the pump stands. The suction pipe is 6 inches in diameter and has three right angled turns in it. The pump works finely up to 100 revolutions per minute, but, if run faster, it pounds, and we do not get any more water. The makers say the suction pipe should be larger. I do not see it. In looking over the sizes of suction pipes used by different makers, I find none larger than 6 inches on a 10 inch water cylinder, and some use a 5 inch pipe. If the pumps need larger pipes, why do they not make the connections to them larger? I find by using a vacuum gage that this pump will create a vacuum equal to a column of water 25 feet high. Now take out the 15 feet the water has to rise in reaching the pump, and allow 8 feet to overcome the friction of the pipe; we still have a head of 2 feet which (according to Box) would give an actual discharge of 662 gallons per minute, while all we get through the pump is 204 gallons per minute. There is no trouble in the pump, as the valve gear and water passages are all greater than the area of a 6 inch pipe. I put a chamber on the pipe near the pump; this made it work better. We want to run the pump at least 200 revolutions, and get all the water such speed should give. There is no leak in the suction pipe. Would a pump that receives and discharges water at both strokes work any better on this pipe? A. The pump seems, from your account, to be performing very well. A larger pipe would, of course, help matters somewhat, by reducing the velocity with which the water flows through the pipe, and effecting a consequent reduction of the head. An ordinary double acting pump would probably draw more water through the present pipe. It seems as if you had taken too low an estimate of the friction of the pipe, since, if the pump is all right, the trouble must be in the pipe.

(2) J. M. asks: I have been trying to get some aldehyde ammonia (described in Science Record for 1872, in Liebig's process of silvering glass, as improved by R. Siemens). How is it made? A. Ammonia aldehyde is best obtained by the action of chromic acid upon alcohol. Equal weights of powdered dichromate of potash and strong alcohol are introduced into a glass flask provided with a safety tube, and placed in a sand bath; 1 1/2 parts of sulphuric acid are gradually added by the safety tube. Much heat is produced by the mixture, and the distillation commences at once, but is continued by a gentle lamp heat under the sand bath. The vapors conducted through the worm of a condenser, surrounded by ice water. The impure product is mixed with ether and saturated with ammonia, when ammoniac aldehyde separates in fine crystals. The apparatus should be made entirely of glass.

(3) O. J. P. says: A person living three miles below Montreal wishes to draw water from the river St. Lawrence, by means of an ordinary brass pump 3 inches in diameter, with an iron pipe 1 1/2 inches, and 200 feet long; but finding by past experience that, if he should run the pipes out into deep water, they are invariably broken every spring by the ice (which, in its yearly "shove," makes an immense pile resting on the river bottom, breaking the pipes and rising sometimes twenty feet above the water), I desire to know: 1. Could I, by placing a perforated barrel in an excavation, at a depth below low water mark, obtain water by its natural suction into the barrel? A. It would depend on the nature of the soil, and the easiest way to settle the matter would be to try the experiment. 2. For purposes of filtration, would it do to surround the barrel by a row of brick placed without mortar, then by another row of brick around and at about six inches from the former, and finally fill the space between the two rows of bricks with wood charcoal? Would there be any danger of the brick preventing the water from filtering through it, from the closing of its pores in the course of time? If, in making the excavation or hole, I should meet with a soapy kind of clay very usual on the northwestern shore of this river, and commonly called blue or red clay, might I expect that the water would filter through such clay? If it should so filter, would this water be pure and the same as the river water? If this plan would not do, would you be good enough to suggest another? A. It would not be necessary to have the brick wall. Use two barrels, putting the filtering material into one, and letting the water run into the other. The water would probably not filter through the clay. 3. How do you determine the right size of an eduction pipe of a force pump, say a common force pump of 3 inches bore with an induction iron pipe 1 1/2 inches in diameter and 200 feet long, 20 feet above the water level, the reservoir in the house being at about 20 feet above the pump? Must I use 1 1/2 or 1 3/4 inches for this eduction pipe? A. Use pipe suitable for connection on the pump. 4. I am to build a screw which will work under water by the force of the stream or current, which runs at the rate of about three miles an hour. This screw will be connected with two small submerged brass pumps, by means of gearing, to force up water for house or manufacturing purposes. The screw would be made of iron, 3 feet in diameter, making 5 revolutions to each stroke of the pump. The pump would be 2 inches diameter and 6 inches stroke, or 3 inches diameter and 6 inches stroke. Will this do? A. An undershot wheel would answer better. The plan is old, and not very efficient.

(4) L. L. asks: How can I determine accurately the strength of alcohol? A. Determining the purity of alcohol is what is known as alcoholometry. For the purpose of ascertaining the quantity of alcohol contained in a fluid which consists only of alcohol and water, the areometer is generally used. It is an instrument very similar to the hydrometer. The areometer of Tralle and that of Richter are most generally used. Stoppin's is similar to that of Richter. Both are centesimal alcoholometers and show, by the number of the degree to which they sink, the percentage of pure alcohol. The difference between these two instruments consists in that the areometer of Tralle indicates the percentage of volume, and Richter's by weight. The specific gravity of pure or absolute alcohol is 0.793, water being unity.

(5) J. L. C. asks: 1. How can I make a cheap and reliable rain gage or measure? A. The rain gage or pluviometer ordinarily consists of a cylindrical vessel closed at the top by a funnel-shaped lid, in which there is a small hole through which the rain falls. At the bottom of the vessel is a vertical glass tube, in which the water rises to the same height as inside the rain gage, and is measured by a scale placed on the outside of the vessel behind the tube. 2. Will a glass funnel inserted in a bottle or jar, placed in an open space, correctly indicate the amount of rain that falls? If the wind blows so that the rain falls slantingly, will it be a true criterion? A. Yes, to both questions; but not so accurate as the one just described.

(6) A. F. O. asks: 1. In the Leclanché battery, would not platinum or platinumized silver be as good as the carbon plate? A. No; but copper might be used but for its greater cost. 2. What is the use of the peroxide of manganese? A. The manganese peroxide, if saturated with the solution, increases the resistance of the battery. 3. Why must the fluid extend from one half to two thirds the way up the jar and no farther? A. To aid in the oxidation of the carbon. 4. What is the light yellow efflorescence that appears around the top of the porous cup? A. It is due to impurities. 5. I keep a Leclanché element ready for occasional and irregular experiments. As it is perfectly convenient to remove the zinc when the battery is not in use, would it not be better to do so? Or is there absolutely no change or waste going on when the circuit is not closed, although the zinc is immersed in the fluid? A. The zinc rod should always be thoroughly amalgamated, in which condition it suffers no alteration whatever. 6. What are the chemical reactions of the battery? A. The carbon is oxidized by the manganese, in which state it combines with the liberated ammonia to form a carbonate. 7. It is a general truth that electrical work is batteries in proportion to the amount of zinc consumed. I have a Leclanché cell with a zinc exposure of but 5 square inches, that is doing more work than a Daniell of 50 square inches; and a similar disproportion between work and zinc seems to exist between the Leclanché and all other forms of battery. How is it accounted for? A. In batteries in which the zinc is the positive element, the work is proportioned to the zinc consumed; but in the Leclanché cell, the conditions are reversed, the carbon being positive and the zinc negative.

(7) W. H. McC. asks: How can I magnetize a compass needle? A. A steel needle may be readily magnetized by placing it in connection with one of the poles of a strong magnet for a short time. The finer the quality of steel, the stronger will be the resulting magnet.

(8) A. S. G. says: In connection with an answer No. 18 on p. 187 of your current volume, my experience with a small electric machine may not be uninteresting. When attending school, I made one with a homeopathic bottle, of which the rubbing surface was not quite 2 inches. The bottle was about 1/2 inch in diameter. The prime conductor was of wood, covered with tinfoil and insulated by a small bottle; the rubber was of silk, stuffed with cotton, not insulated. The Leyden jars were small bottles, about 1 1/2 inches high covered with tinfoil, and filled with small pieces of lead. This machine exhibited all the phenomena presented by larger ones, of course in degree proportioned to its size, but quite as distinctly. The jars gave a spark which was like the prick of a small pin, and the spark from the battery of four was too unpleasant to be often taken. I do not know that a smaller frictional machine than this has ever been made.

(9) A. O. W. asks: Is there anything that will make spelter flow easily on copper, to braze the copper easily? A. We do not know of any method other than the application of heat.

(10) G. W. asks: Why is it that the shadow of an object from the sun grows short faster in the morning than it does towards noon? A. In the morning the direction of the sun's motion is the same as the longest dimension of the object; in the meridian it is in the same direction as the smallest dimension. A pole would project its shadow as a long line in the morning, as a mere point when the sun stood directly overhead.

(11) J. W. D. says, in answer to J. H. A., who asks: What is the force of blow from a steam hammer with a 5 inch cylinder, driven by 100 lbs. pressure on the inch, working at full stroke, stroke being 1 foot and weight 300 lbs.: Velocity of a body falling 1 foot=802 feet. 802x300=2406 lbs. force of blow without pressure. Area of 5 inch cylinder=19.635 inches. 19.635x100=1963.5 lbs.=2406=4369.5 lbs. This is regardless of any weight or friction of piston. [If you multiply weight and space together, the resulting product is expressed in foot pounds. The solution of the problem requires the amount of force that, acting by a quiet pressure or pull would produce the same effect as the moving weight.—EDS.]

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated:

F. J. W.—It is limonite. Its composition may be expressed as 2 Fe2O3, 3H2O. It contains 59.9 per cent of iron.—T. F. R.—No. 3 is a quartz rock, lying upon a bed of dark sandstone containing scales of iron pyrites. No. 4 is iron pyrites, distributed through a gray quartz rock. No. 5 is a rock containing felspar, iron pyrites, quartz and hornblende. No minerals were received marked 1 and 2.—H. H.—It is galena.

T. H. C. asks: When were rudders first used to vessels?—L. H. C. asks: What is the proper method of curing the leaf of the tobacco plant?—A. M. R. asks: 1. From the skins of what animals is the leather, used in the dry gas meters, made? 2. Is it made in the United States or in Europe? 3. What property in gas is it that hardens and contracts common leather?—J. M. asks: How can I make virgin platinum?—H. H. R. asks: 1. What pigments are used in calico printing, to make them fast or proof against water? 2. What will make water colors waterproof on paper?

COMMUNICATIONS RECEIVED.

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

- On Taps and Tempering. By T. J. B.
On the South American Boxer. By T. H.
On Lunar Acceleration. By J. H.
On the Philosophy of the Steam Engine. By W. M. H.
On a Small Steam Engine. By O. B. F.
On Spiritualism and Jugglery. By C. I.
On Molecular Conditions and Spectra. By J. C. D.
On the Scriptural Miracles. By —.
On a Grain Binder. By C. H. D.
On a Negro Inventor. By J. S. B.

Also enquiries and answers from the following: M. M.—A. K. S.—J. H.—A. M. P.—G. K.—L. M. Q.—A. L. E.

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 enquiries analogous to the following are sent: "Who makes steel bars as substitutes for church bells? Who makes machines for making brooms, and who sells broom corn? Who sells the best earth closet? Where can soluble glass be obtained? Where are our turning lathes made? Whose is the best book on phonography? Who publishes a book on the manufacture of flax?" All such personal enquiries 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.