

Business and Personal,

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Agricultural Implements and Industrial Machinery for Export and Domestic Use. R. H. Allen & Co., N. Y.

D. Frisbie & Co. manufacture the Friction Pulley—Captain—best in the World. New Haven, Conn.

Wanted—Parties to manufacture, on a royalty, an instrument to prove Steam Gauges. Address E. F. Osborne, St. Paul, Minn.

“Eureka”—Best Weather Strip out. Patent for Sale, cheap. Make an offer. I mean business. Illustrated in Sci. American, Oct. 9, '75. Frank Fleury, Springfield, Ill.

India Rubber—Capitalists are invited to Examine a new process of manufacturing India Rubber, by which one half the labor and machinery are saved. Address India Rubber, 52 Park Place, New York City.

Foundrymen, letter your patterns with Metallic Letters made by H. W. Knight, Seneca Falls, N. Y.

First class Mechanical Draughtsman is open for engagement. Address T. P. Pemberton, 502 Clermont Avenue, Brooklyn, N. Y.

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A good Machinist is wanted, who can invest \$2,000 in a good paying business, which will be permanent. Address N. Upham, Agent, Athol, Mass.

A Scraper Patent for Sale. Address R. Veree, 88 Wall St., New York.

More than Ten Thousand Crank Shafts made by Chester Steel Castings Co., now running; 8 years' constant use prove them stronger and more durable than wrought iron. See advertisement, page 189.

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 39 Park Row, New York.

Glass Blown Cylinders. T. Degnan, 129 Milk St., Boston, Mass.

Planing Machines—For the best and cheapest traveling bed or “Farrar” Planers—24, 27, and 30 in.—also 15, 18, and 24 in. stationary-bed machines, address Lane Mfg Company, Montpelier, Vermont.

Models for Inventors. H. B. Morris, Ithaca, N. Y.

Steel Name Stamps, post paid, for 18c. per letter. Marks on Wood, Iron, and Steel. Agents wanted. Steel Stamp Works, 213 Chapel St., New Haven, Conn.

Handbook of Useful Information for Lumbermen, Millwrights, and Engineers (152 pages) sent free by Lane Mfg Company, Montpelier, Vermont.

Horse Nail Machines—Wanted Machines for finishing and pointing Horse Nails. J. W. Britton, 18th Ward, Cleveland, O.

Jethro Wood.—If any of our readers can send or refer us to any publication containing a portrait of Jethro Wood, the plow inventor, we should be obliged. Mann & Co.

For the cheapest and best Small Portable Engine manufactured, address Peter Walrath, Chittanooga, N. Y.

Circular Saw Mills of the celebrated and popular “Lane” pattern, made under, direct supervision of inventor by the Lane Mfg Company, Montpelier, Vt.

M. Shaw, Manufacturer of Insulated Wire for galvanic and telegraph purposes, &c., 259 W. 27th St., N. Y.

F. C. Beach & Co., makers of the Tom Thumb Telegraph and other electrical machines, have removed to 530 Water Street, New York.

Pat'd Graining Stencils—J. J. Callow, Clevel'd, O.

Lathe Dogs, Expanding Mandrels, Steel Clamps, &c., for Machinists. Manufactured by C. W. LeCount, So. Norwalk, Ct. Send for reduced Price List.

“Abbe” Bolt Forging Machines and Palmer Power Hammers a specialty. Send for reduced price lists. S. C. Forsaith & Co., Manchester, N. H.

400 new & 2d hand Machines, at low prices, fully described in printed lists. Send stamp, stating just what you want. S. C. Forsaith & Co., Manchester, N. H.

Lane's “Monitor” Turbine Water-Wheels are not perpetual motion machines, but they combine more and greater advantages than any other water motors offered the public. Address Lane Mfg Co., Montpelier, Vt.

Driving Belts made to order, to accomplish work required. Send full particulars for prices to C. W. Army, 148 North Third St., Philadelphia, Pa.

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

John McDonald (formerly of Kingston, Jamaica) will please address Geo. B. Lundy, Balmoral, Ontario, Ca.

Hydrant Hose, Pipes, and Couplings. 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 & Beiden Co., Danbury, Ct.

Power & Foot Presses & all Fruit-can Tools. Ferracute Wks., Bridgeton, N. J. & C. 27, Mch'y. Hall, Cent'l.

Shingles and Heading Sawing Machine. See advertisement of Trevor & Co., Lockport, N. Y.

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.

Clapboard Machinery—Sawing, dressing, and trimming—a specialty of the Lane Mfg Company, Montpelier, Vermont.

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

Diamond Tools—J. Dickinson, 64 Nassau St., N. Y. Temples and Oilcans. Draper, Hopedale, Mass.

Notes & Queries

It has been our custom for thirty years past to devote a considerable space to the answering of questions by correspondents; so useful have these labors proved that the SCIENTIFIC AMERICAN office has become the factotum, or headquarters to which everybody sends, who wants special information upon any particular subject. So large is the number of our correspondents, so wide the range of their inquiries, so desirous are we to meet their wants and supply correct information, that we are obliged to employ the constant assistance of a considerable staff of experienced writers, who have the requisite knowledge or access to the latest and best sources of information. For example, questions relating to steam engines, boilers, boats, locomotives, railways, etc., are considered and answered by a professional engineer of distinguished ability and extensive practical experience. Enquiries relating to electricity are answered by one of the most able and prominent practical electricians in this country. Astronomical queries by a practical astronomer. Chemical enquiries by one of our most eminent and experienced professors of chemistry; and so on through all the various departments. In this way we are enabled to answer the thousands of questions and furnish the large mass of information which these correspondence columns present. The large number of questioners—they pour in upon us from all parts of the world—renders it impossible for us to publish all. The editor selects from the mass those that he thinks most likely to be of general interest to the readers of the SCIENTIFIC AMERICAN. These, with the replies, are printed; the remainder go into the waste basket. Many of the rejected questions are of a primitive or personal nature, which should be answered by mail; in fact hundreds of correspondents desire a special reply by post, but very few of them are thoughtful enough to enclose so much as a postage stamp. We could in many cases send a brief reply by mail if the writer were to enclose a small fee, a dollar or more, according to the nature or importance of the case. When we cannot furnish the information, the money is promptly returned to the sender.

T. B. G. can remove tattoo marks from the hands by the process described on p. 331, vol. 30.—G. B. should read our remarks on p. 202, vol. 34, on dissolving shellac.—B. can ebonize white wood by the process described on p. 50, vol. 33.—I. F. D. H. will find directions for making printing ink on p. 107, vol. 35.—Mrs. R. can chemically preserve natural flowers by dipping them in hot melted paraffin.—G. S. can best clarify varnish by filtration.—B. C. is informed that a recipe for erasive soap was published on p. 181, vol. 31.—B. L. F. will find directions for cutting glass with hydrofluoric acid on p. 379, vol. 33.—F. S. can polish white metallic alloys by the process described on p. 57, vol. 34.—R. W., T. D., W. S. H., W. B., W. A. R., A. A. C., G. M., J. B., J. M. P., J. E. S., and 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) M. M. C. asks: Does a point on a connecting rod between the centers of the crank pin and crosshead journal describe a perfect ellipse, or is the figure which it describes slightly larger at one end than at the other? A. Slightly larger at one end.

(2) A. W. H. asks: I have a side stroke slide valve portable engine. Cylinder is 7 1/4 inches in diameter, with 14 inches stroke. It is rated at 12 horse power. I run a gin stand with it at speed of 250 to 300 revolutions per minute. I think it ought to run at 125 or 130 revolutions of the driving wheel per minute when the gin saws are at their maximum, 300 revolutions per minute. A friend contends that the engine would do the work more easily running at 75 revolutions per minute. Which is right? A. You are.

(3) J. P. asks: Of what benefit is lagging between the jacket and the boiler of a locomotive? A. It prevents the heat passing off, by conduction, to the air.

(4) A. B. says: We have two engines, each 7x12 inches, attached to one shaft; they are reversible by link motions, and are provided with ordinary slide valves. One of the engines has too much opening on either center. How can we shorten the stroke so there will not be more than 3/4 inch opening on either center? A. Place the eccentric more nearly at a right angle to the crank.

(5) G. M. F. asks: Will plaster of Paris, made in the form of a cup, answer for the porous cup in the Bunsen battery? A. No, for the reason that it is not porous.

(6) C. W. M. asks: 1. What should be the inside and outside diameter of a helix, whose length is 3 inches? A. Inside 1 inch, outside 2 inches. 2. Of what size should the wire be, to give the greatest lifting force? A. Use No. 14 copper wire. 3. Would any kind of wood do for a spool for winding it on? A. No spool is necessary. Wind the wire on the iron core.

(7) W. B. asks: If two magnets be placed parallel, with their opposite poles together, the poles will attract each other. If the magnets be placed end to end, with the positive pole of one to the negative pole of the other, they will repel, according to Ampere's theory, whereas in practice they attract. How is this explained? A. According to Ampere, they should attract under the conditions mentioned.

(8) A. S. says: I am making an electro-magnet, which I wish to insulate by winding on silk, and then dipping in paraffin. The only paraffin I can get here is made up into candles, which

I fear may be adulterated with something that would spoil my wire after I have taken the pains to wind it. Would you advise me to use it? A. The silk is sufficient. The dipping in paraffin will do harm.

(9) M. A. G. asks: 1. Is a hollow lightning rod as good a conductor of electricity as a solid one of the same diameter and same metal? A. No. 2. Is the conductive property of a rod in proportion to its surface, or to its solid contents? A. To its solid contents.

(10) C. M. says: 1. I have an electrical conductor on my dwelling house, composed of three twisted iron wires and a small copper wire between each of the three strands, about 1/2 inch diameter altogether. Is such a rod a suitable protector against electric shocks? A. Yes, if properly connected with the earth. 2. Would a galvanized iron rope of 3/4 inch diameter be as good as a conductor? The rope would be probably twice the weight per foot of the lightning rod. A. Yes, better than the other.

(11) W. N. G. asks: What is the average distance which a printer's hand travels for each typeset? A. About 30 inches.

(12) L. C. K. says: I wish to bring water into my house from a spring 30 rods from the house and 100 feet higher. I wish to use 1/2 inch iron pipe. I am told that it will fill in a short time with rust so as to stop the flow of water entirely. Would it be advisable for me to lay iron or lead pipe? A. A tin-lined iron pipe is now being introduced into the market, which we think will best answer your purpose, and probably not cost more than a lead pipe of sufficient thickness to bear the pressure.

(13) T. E. K. asks: Is there a preparation for rusting steam joints together? A. Use a mixture of cast iron borings 100 lbs. and sal ammoniac 8 ozs., well wetted with water.

(14) G. D. M. asks: Can you tell me what substance plasterers mix with their white glue in making molds for ornamental plaster work, to give a gray color and make it tough like rubber? A. No; glycerin is said to be a good coating for the interior, but lard and oil is most commonly used. Plaster casts, immersed in a hot solution of glue long enough to be well saturated, will bear a nail driven in without cracking.

(15) F. R. asks: Is solder as good after it has been in use on iron and brass as when new? A. No.

(16) L. S. C. asks: 1. What good material or paint can you recommend to cover a shingle roof, to make it approximately fireproof against sparks and heat in case of the burning of an adjoining building? A. Quicklime boiled in linseed oil and applied hot is said to be fireproof. 2. Can a durable wall 9 inches thick be made of sundried unburnt brick for a building one story high, the foundation being of burnt brick? A. We should consider the wall too thin: it is not likely to sustain the roof; 16 inches thick would do better. It could be laid up in clay. 3. Would hydraulic cement adhere to such a wall, if plastered on the outside? A. No; it would be better to fur off the inside, and lath and plaster it in the usual way.

(17) J. R. K. asks: Has the temperature any effect on a steel spring blade? A. The effect will not be noticeable by ordinary measurements.

(18) T. M. M. asks: Is there not such a thing as getting lumber too dry? We kiln our lumber in a very hot dry house. Sometimes we leave it in a week longer than we should if we were in a great hurry for it. Our foreman claims that there is no such a thing as getting lumber too dry; but we find sometimes, after we have used lumber that has been in the kiln so long, that the end wood swells. A. We think your foreman is right; but kiln-dried lumber is no doubt more subject to swell by the absorption of moisture than that which is seasoned by long exposure to the action of the weather. If you stack your lumber two or three years before using it, you will no doubt have the best seasoned stuff.

(19) J. S. asks: How much powder will a small mortar, with a bore of 4 inches diameter and length 4 1/2 inches, take to throw a shell 1/2 of a mile? A. From 1/2 to 3/4 lb.

(20) B. F. M. says: I have canned some blackberries and raspberries, but I have lost about 25 cans by the cans pulling in two; sometimes they will burst all to pieces. Can you give us some reason for it? A. In canning fruit it is necessary, in order to expel as much of the air as possible, as well as to destroy any incipient germs of fermentation, (1) that the vessels should be as full as possible and (2) that before being sealed they should be placed for a short time in boiling water until their contents become of the same temperature as the surrounding water, in which condition they should be sealed, and immediately thereafter removed and allowed to cool.

(21) L. A. asks: Is there anything except muriatic acid that I can use for soldering copper or tin to galvanized iron, or for soldering the iron itself, and make a smooth job? A. Use borax, acid chloride of zinc, or sal ammoniac.

(22) B. W. says: We have some steelyards that have no poise. Can you tell me how to make or adjust one? A. The principle on which the steelyard acts is that of the simple lever. If you can get two or three correct weights, you can make a poise by experiment. To calculate the proper weight of the poise, measure the lever arm of the weight, and that of the poise to one or more of the notches, and use the proportion that any given weight is to the required poise as the distance from the fulcrum to the poise is to the distance from the fulcrum to the weight.

(23) C. E. C. asks: How can I best succeed in getting a journal to make itself a seat in a

bearing that is slightly too narrow for it? A. File out the sides of the bearing.

Is it likely that any other substance than oil or mud is the cause of the water foaming or surging in the upright tubular boiler? A. There are other causes, such as want of sufficient steam power.

(24) F. H. S. says: My friend claims that in a chronometer watch the escapement will commence to move at the same moment that the detent liberates the said escape wheel. I claim that the inertia of the train of wheels is sufficient to retard the time for commencement of motion of the escape wheel sufficiently to allow the balance to move through a space of at least three degrees from the time the detent has just liberated the escape wheel to the time that said escape wheel commences its movement with every beat of the balance, pendulum, or whatever it may be. Who is correct? A. Your view of the matter is the more correct of the two, though the amount of motion of the balance wheel before the other commences to move could only be settled by experiment. It should be noted, also, that the teeth of the escape wheel could have such a shape that it would be in motion while disengaging from the escapement. Possibly this is the case in some watches.

(25) J. E. W. says: I am running my engine at the rate of 175 revolutions per minute. What would be the difference in the amount of steam that I should use if I ran it at 200 revolutions per minute, provided that I increase the size of pulley on machinery so that the engine will be doing the same amount of work? A. There will be no great difference, but there will probably be a little gain by using the increased speed.

(26) A. L. asks: What would be the safe pressure for 1/2 inch external diameter steel pipe 0.3 inch in thickness, and also of 1 inch external diameter steel pipe, 1/4 inch thick? A. About 5,000 and 2,000 lbs. per square inch respectively.

(27) W. R. H. says: In a recent issue you describe a new electric battery. I have had this battery in use since January last. The jar is a common glass tumbler. The zinc cylinder is sheet zinc, twice the height of the tumbler. The porous cup is made of blotting paper around the zinc turned in at the bottom. The copper wire is coiled over the paper, which keeps the zinc and paper in place. Sulphate of copper solution is used as in a Daniell battery. This battery can be constructed for twenty cents, and will work from 5 to 8 weeks, producing a current suitable for experimental purposes. By making the zinc cylinder twice the height of the tumbler, the battery remains in working order longer. The zinc, being very thin, is soon destroyed on the lower edge; but by pushing the cylinder down, the same amount of surface is exposed to the action of the acid. A. The Daniell battery is capable of many modifications, and this is as good as many others which have been used.

(28) E. S. asks: What will remove a linseed oil stain from common white cloth? A. Try benzine or naphtha, and press with a little warm pipe clay.

(29) R. T. S. asks: How can I dye white kid slippers black? A. First steep the material in a strong, hot solution of logwood, and then in one of sulphate of iron (copperas). Repeat if necessary.

(30) W. B. asks: How can I pulverize mica? A. Heat it as hot as possible, and while in this condition plunge it suddenly into cold water. It thus becomes very brittle and may be reduced without difficulty.

(31) W. G. S. asks: What is the hydraulic pressure of a column of water 30 feet high? A. About 12 1/2 lbs. on the square inch.

Can I get a full large blaze from glycerin by putting the fluid above the light? I can get it to burn, but it gives a small blaze which, it seems, will not get any larger. A. A higher temperature in contact with the air will produce a rapid decomposition of the glycerin, giving a much stronger flame, but at the same time liberating irritating and offensive fumes of acrolein. 2. What is the cost of it compared with alcohol? A. Glycerin, in comparison with alcohol, is very cheap.

(32) D. F. E. asks: How much sand and lime does it take to mix one bushel of Rosendale cement in mortar for laying brick? A. One of cement, one of lime, and six of sand will make a good mortar for brickwork.

(33) W. G. W. says: I am bringing water 250 feet from a well through a 1 1/2 inches plain wrought iron pipe. The water is clear and good, to all appearance; but when it has stood in a pail or vessel of any kind an hour or more, a greasy reddish scum arises to the surface in sufficient quantity to color the inside, so that it requires considerable scrubbing to clean it off. Is there any chemical property in the water that causes the difficulty? A. The sediment you mention is very probably due to some corrosive action of the water on the iron conduits. This may be due in part to the presence of free carbonic acid. Draw a quantity of the water, add to it a small quantity of lime water, and allow to stand overnight; then draw off the clear water. The addition of the lime water will neutralize the free acid, with which it forms an insoluble salt, and at the same time precipitate any iron that may be in solution. Experience will soon teach you the proper quantity of lime water necessary.

(34) J. A. V. asks: What is the most efficient means of stopping and preventing leaks in gutters? I have one of copper that leaks terribly, thereby ruining the cornice of wood beneath. A. If your roof is a steep-pitched one, the copper lining of the gutter may not extend up far enough under the covering to prevent the water from flowing over the back edge of it, into the