

Business and Personal,

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For Sale—10 in. Bement Slotter, Friction Hoisting, and Mining Engines. J. S. Mundy, Newark, N. J. Agricultural Implements and Industrial Machinery for Export and Domestic Use. R. H. Allen & Co., N. Y.

Henry F. Lawrence, who received a Patent on Tunnels, Aug. 6, 1872, will please address Frank H. Winston, Evansville, Wis.

Catarrah—Dr. Karsner's Remedy. Sure Cure. Sample Free. J. C. Tilton, Pittsburgh, Pa.

For Specialties in Woollens, Seamless Roller Covers, Printers' Blankets, &c., address H. Waterbury & Co., Rensselaerville, Albany Co., N. Y.

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

Wanted—On royalty, by a reliable house, some good practical invention in Cast Iron, Brass, or Machinery, to work as a specialty. Address Foundry, Station B, Philadelphia, Pa.

For Sale—5 ft. Planer, \$290; 3 ft. do., \$175; 18 in. x 10 ft. Lathe, \$225; 1 1/2 in. Bolt Cutter, \$125; 22 in. x 12 ft. Lathe, \$200; 38 in. Drill, \$275. At Shearman's, 309 Arch Street, Philadelphia, Pa.

Send \$1.75 to Milton Bradley & Co., Springfield, Mass., for a perfect Dress Making Machine, or address for circular to agents.

The Target Air Pistol kills cats, rabbits, squirrels, pheasants, pigeons, and other small game. Mailed, post paid, for \$3.75. Send stamp for circular and testimonials. E. H. Hawley, 188 Orange St., New Haven, Ct.

Best Bolter for Sawing Handles, Furniture Stuff, Wagon Stuff, Fence Boards, &c. Send for Circulars. Richard W. Montross, Galien, Mich.

Send 20 cents to Milton Bradley & Co., Springfield, Mass., for New Mechanical Drawing Book; or address for a circular.

Wanted—To purchase Theine or Caffeine largely. Price and particulars to Mr. Dixon, Canonbury Lodge, Canonbury, London, England.

For Sale—1/2 interest in the Adding Pencil recently illustrated and described in this paper. Address M. M. Smith, Kirksville, Mo.

The surprising results in saving of fuel by the use of Asbestos Steam Pipe and Boiler Coverings are worthy the attention of every one using steam. The genuine can be procured of H. W. Johns, 87 Maiden Lane, New York, patentec and sole manufacturer of Asbestos Materials.

One Friction Clutch Pulley, 36 in. diam. x 22 in. face, 4 in. bore; and one do. do. 36 in. diam. x 12 in. face, 3 1/2 in. bore, used to drive cold rolled shafting at Centennial. For sale by V. W. Mason & Co., Prov., R. I.

Baxter's Adjustable Wrenches, price greatly reduced. Greene, Tweed & Co., 18 Park Place, N. Y.

Slide Rest for \$8 to fit any lathe. Goodnow & Wightman, 23 Cornhill, Boston, Mass.

To Lease—The largest portion of the building corner Canal, Center, and Walker Sts., now occupied as a Billiard Manufacturing and Sales Room. See advertisement in another column.

The Cabinet Machine—A Complete Wood Worker. M. R. Conway, 22 W. 2d St., Cincinnati, Ohio.

The Gatling Gun received the only medal and award given for machine guns at the Centennial Exhibition. For information regarding this gun, address Gatling Gun Co., Hartford, Conn., U. S. A.

Journal of Microscopy—For Amateurs. Plain, practical, reliable. 50 cents per year. Specimens free. Address Box 4875, New York.

For Sale—Shop Rights to every Tool Builder and manufacturer for Bean's Patent Friction Pulley Countershaft. D. Frisbie & Co., New Haven, Conn.

Superior Lace Leather, all Sizes, Cheap. Hooks and Couplings for flat and round Belts. Send for catalogue. C. W. Arny, 148 North 9d St., Philadelphia, Pa.

Magic Lanterns, Stereopticons, for Parlor Entertainments and Public Exhibitions. Pays well on small capital. 74 Page Catalogue free. Centennial Medal and Diploma awarded. McAllister, 49 Nassau St., N. Y.

Noiseless Exhaust Nozzles for Exhaust Pipes and Pop Valves. T. Shaw, 915 Ridge Av., Phila., Pa.

Fire Hose, Rubber Lined Linen, also Cotton, finest quality. Bureka Fire Hose Co., 13 Barclay St., New York.

The Scientific American Supplement—Any desired back number can be had for 10 cents, at this office, or almost any news store.

To stop leaks in boiler tubes, use Quinn's Patent Ferrules. Address S. M. Co., 80, Newmarket, N. H.

Water, Gas, and Steam Pipe, Wrought Iron. Send for prices. Bailey, Farrell & Co., Pittsburgh, Pa.

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

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 38 Park Row, New York.

M. Shaw, Manufacturer of Insulated Wire for galvanic and telegraph purposes, &c., 259 W. 37th 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.

Power & Foot Presses & all Fruit-can Tools. Ferracute Wks., Bridgeton, N. J. & C. 37, Mch. Hall, Cent'ry.

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

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

Steel Castings, from one lb. to five thousand lbs. invaluable for strength and durability. Circulars free. Pittsburgh Steel Casting Co., Pittsburgh, Pa.

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.

"Dead Stroke" Power Hammers—recently greatly improved, increasing cost over 10 per cent. Prices reduced over 20 per cent. Hull & Belden Co., Danbury, Ct.

Lansdell's Pat. Steam Syphons—Lansdell & Leng's Lever and Cam Valve. Leng & Ogdin, 212 Pearl St., N. Y.

Walrus Leather, Emery, Crocus and Composition for polishing Metals. Greene, Tweed & Co., 18 Park Place, New York.

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

For Sale—Two first class Household Articles, by State or Counties. Address Duke & James, Lancaster, Pa.

To Clean Boiler Tubes—Use National Steel Tube Cleaner, tempered and strong. Chalmers Spence Co., N. Y.

Chester Steel Castings Co. make castings twice as strong as malleable iron castings at about the same price. See their advertisement, page 365.

Patent Scroll and Band Saws, best and cheapest in use. Cordesman, Egan & Co., Cincinnati, Ohio.

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 questions sent—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.

R. B. L. will find directions for polishing pebbles on p. 138, vol. 30.—J. D. will find a description of a method of utilizing the waste heat from lime kilns on p. 290, vol. 32.—J. D. will find directions for tanning sheepskins with the wool on p. 233, vol. 26.—B. I. will find a good recipe for black ink on p. 250, vol. 34.—R. I. & U. K. should consult *The Hub*, published in this city.—L. A. F. will find an article on potash in corn cobs on p. 306, vol. 26.—J. B. P. will find a description of a spring power for sewing machines on p. 124, vol. 27.—F. L. will find a recipe for a balloon varnish on p. 74, vol. 32.—J. S. M. will find directions for painting magic lantern pictures on another page of this issue. For a recipe for jet black ink, see p. 250, vol. 34.—M. G. S. will find a recipe for Babbitt metal on p. 122, vol. 28.—W. F. S. will find the demonstration of his rule for finding the area of a triangle in any good book on trigonometry.—F. E. B. will find directions for ebonizing wood on p. 50, vol. 33.—J. W. B. will find directions for preserving cider on p. 11, vol. 31.—D. will find an explanation of the travel of car wheels on a curve on p. 268, vol. 35.—R. L. K. should put a tablespoonful of coarse brown sugar in a quart of flour paste, to fasten paper labels to tin cans with. This also answers F. F., who will find a recipe for a blue lacquer on tin on p. 75, vol. 32.—W. B. P. will find directions for gilding without a battery on p. 106, vol. 34. For silver-plating without a battery, see p. 299, vol. 31. For nickel-plating with a battery, see p. 151, vol. 30.—G. F. R. will find something on keeping water fresh on p. 156, vol. 31.—F. W. E. should galvanize his iron sink. See p. 346, vol. 31.—R. B. W. will find a recipe for a hair stimulant on p. 263, vol. 31.—W. will find directions for treating a corn on p. 202, vol. 34.—W. A. will find directions for making vinegar from cider on p. 106, vol. 32.—S. D. P. will find directions for waterproofing canvas on p. 347, vol. 31. For keeping cider, follow the directions on p. 11, vol. 31. For a recipe for bird lime, see p. 547, vol. 28.—J. S. P. will find an answer to his query as to rotary engines on p. 123, vol. 30.—J. H. R. will find a recipe for oroid metal on p. 347, vol. 30.—F. H. N. will find articles on compound engines on pp. 122, 280, vol. 30.—R. L. will find the dimensions of the propeller of the Baxter canal boat on p. 291, vol. 29.—R. A. C. is informed that Mr. Charles Darwin, the evolutionist, is living.—E. B. can drill china with a sharp, swiftly revolving steel drill. For coppering iron, see p. 90, vol. 31.—C. E. S. can line his cooking kettles with a porcelain coating by the process described on p. 362, vol. 32.—H. B. B. will find a description of vulcan and sand-rock powders on p. 2, vol. 34.—E. T. B., G. M. W., J. A., G. F. S., A. W. A., G. D., P. G., 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) J. H. I. says: 1. Please give me a recipe for restoring the color to cloth, the color having been taken out by lime. A. Have you tried a little dilute muriatic acid? The most satisfactory method, perhaps, will be to have the cloth re-dyed. 2. How can I restore the color to a straw hat which has become yellow? A. Subject it to the vapor of a dishful of burning sulphur (sulphurous acid gas) in a tight box or closet.

(2) G. P. H. says: How can we make raw-hide soft and pliable for hobbles, bell collars, lassos, etc.? Is it the glue in the hide that makes it so hard? What is the best method to soften it? Oil alone will not do it. A. The hides of animals, owing to their complex chemical structure and the large amount of nitrogenous principles which they contain, are very prone to rapid putrefaction when exposed to a moist air. In very dry climates they soon lose their natural suppleness and become stiff and hard by a process of desiccation. It was by the effort to overcome all these difficulties that the process of fixing the gelatinous bodies contained in the hide, that is, the system of tanning them, was first introduced. We do not know of a better one that we deem practicable in your case.

(3) E. G. W. says: I hear that a German society has offered \$400 prize for a cheap and efficient way of extracting the carbonic acid from coal gas. Does petroleum gas contain the acid, and does the acid impair the light? A. Gas from petroleum contains only a very small quantity of carbonic acid. The quantity is so small that it may be altogether overlooked.

(4) H. C. asks: Would filtering vinegar through a common filter (that is composed in part of charcoal) change the color or injure the vinegar in any way? A. Make your filter of animal charcoal, or freshly or thoroughly burnt vegetable charcoal. If the charcoal has not been thoroughly burnt it may impart some unpleasant taste to the vinegar. If the vinegar be allowed to pass slowly through the filter, a part, at least, of the dark color will be removed.

(5) F. B. asks: How shall I bleach a silken fabric? A. Have you tried sulphurous acid? This is the usual bleaching agent employed for silk, but it requires some previous technical experience in the matter to be enabled to do it well. After being sulphured, the goods are passed through an extremely dilute solution of sulphuric acid, and washed.

(6) J. H. R. asks: What degree of heat does it require for calcining gypsum in an oven? The gypsum is broken about the size of hickory nuts. How long will it take to make good stucco out of it? A. If, as we understand you, you wish to ignite the gypsum in order to obtain plaster of Paris, it is necessary to remove the greater part of the water of crystallization by heating the mineral for some time at a temperature of about 300° Fah. If the temperature is allowed to rise above 300°, it will not, when moistened, resume its water of crystallization. There are numerous other precautions necessary to be observed, in order to obtain a good product. See p. 173, SCIENCE RECORD, for 1874.

(7) E. K. M. says: Our home-made hard soap, in drying, shrinks very much. What can we do to make it retain its shape? A. All recently made soap shrinks more or less in drying, from the loss of water. This cannot be avoided.

(8) C. D. asks: How are blank spaces obtained in an engraving produced by the photo-engraving process? I understand the method of photo-engraving (by means of the sunlight passing through a photographic negative and falling on a plate of glass coated with a film of gelatin and bichromate of potash, etc.); but I have never yet seen in any description of the process an explanation of the means employed to obtain the wide blank spaces in the engraving: spaces, say, from a quarter of an inch to an inch in width. Are such lights in the picture obtained by eating away the spaces between the reliefs with acids in the stereotype plate, or are the spaces cut out of the plate with the engraver's tools? A. See pp. 178, 235, 139, vol. 33, and pp. 95, 186, 169, 168, 185, SCIENCE RECORD for 1876. You will find, by examination, that the references to this and other similar processes have been very numerous in the back numbers of the SCIENTIFIC AMERICAN. 2. Do you know of any acid that will corrode or soften plaster of Paris, after the plaster has been mixed with water and has hardened, so that the parts touched by the acid may be brushed away with a moderately stiff brush? A. Sulphate of lime is soluble to some extent in hydrochloric and nitric acids, also in sulphate of ammonia. 3. What is the height of the lines in relief in an engraving obtained by the photo-engraving method after the soluble film has been washed away from the glass plate? A. This depends altogether upon the thickness of the films, as well as their number and the length of time of exposure to the light.

(9) H. C. says: What composition can be applied to floors before laying carpets, to preserve them from the attack of moths? A. Use a dilute alcoholic solution of carbolic acid: about 1 part of the acid to 12 or 15 parts of alcohol.

(10) C. P. asks: 1. What is the best material to add to linseed oil while boiling, to give it the hardest drying quality? A. According to Barruell, Jean, Mulder, and others, the borate of manganese is the most excellent sicative. 2. How much of the dryer should be added? A. Use 1 part to 1,000 parts of the oil. 3. How can linseed oil, which has been darkened in boiling, be economically bleached, in considerable quantities? A. It is usually bleached by exposure to strong sunlight in shallow leaden trays (about 4 inches deep) covered with sheets of glass.

(11) J. L. A. asks: What will directly destroy a human tooth, in the mouth or out? A. There is no such substance or preparation known.

(12) H. P. I. says: I use a large wood tank to hold brine, which wastes by passing through the pores of the wood. Is there anything that can be applied to the wood that will fill the pores, and not be acted upon by the brine? Would soluble glass do? A. Perhaps a preparation of asbestos might answer your purpose; this may be obtained in this city, as you will see by consult-

ing our advertising columns. Soluble glass we have not tested in that respect.

(13) R. K. P. says: I have a well irmy cellar that is full of foul air. How can I remove it? A. Drop a pipe into it, within a few inches of the surface of the water, and then pump the air out. Fresh air will take its place.

(14) J. S. says: There is a wooden partition dividing two rooms. I wish to know if the sound of loud talking and laughing can be stopped, so that persons in an adjoining room can hear nothing but a humming or indistinct noise. Will caulking up the cracks and tacking soft carpet paper, 1/2 of an inch thick, keep back the sound? A. Nail a few upright strips upon the face of the partition, and cover it with cloth, wet a little, stretched taut, and tacked to the strips. Now put a wall paper upon the cloth; at the same time fill up the joints of the plank in the present partition where open.

(15) C. A. asks: Can limestone, which has been put in a kiln, and has not been heated enough to extract all the carbonic acid (that is, it does not slake), be put again, after cooling, in another kiln, and make good lime if heated sufficiently? A. Yes.

(16) C. F. asks: I want to coat pump tubing on the inside with coal tar. The tar is to be boiled until all the water is evaporated and it becomes hard and brittle when cold. Would it affect the water so as to make it offensive for family use? A. Good asphalt or pitch might answer, but we cannot insure success in all cases. The method of charring the exposed surfaces of the wood is much more desirable and efficient than the one you suggest.

(17) L. N. says: 1. A man nearly lost his life by sleeping in an upper room of a house adjoining a lime kiln. When found, he was insensible, and could not be resuscitated for over an hour. The doctor says that the effect was produced by gas from the kiln. Some of us do not believe that, as there could not be much gas in the room. The house is about 30 feet from the kiln, and the gas must have entered by the window. A. The doctor's surmise is very probably correct. 2. How much gas must there have been to produce this result? A. Ten per cent of the gas in the atmosphere of a room is sufficient to produce asphyxia in a healthy person remaining for a short time in the room; but this is subject to wide variations, according to the age, physical condition, etc., of the person breathing the vitiated air.

(18) O. C. asks: Do the forces arising from the attraction of gravitation and from momentum depend on the same law for their effective action? To illustrate: If a force of 10 lbs. on a given lever will raise 100 lbs., then double that force will raise 200 lbs. And if 60 lbs. steam will drive a saw 700 revolutions per minute through a 6 inch stick, then it will require (in theory) 120 lbs. to drive it at the same speed through two 6 inch sticks. In practice, I find that force on the lever has the same effect that it has in theory, but that steam has not. The amount of steam is not required to be doubled. One says that this is on account of the momentum, which is not governed, even in theory, by the same law that gravitation is governed by. I contend that it is on account of friction, which theory does not allow for, and that momentum and gravitation, as above illustrated, are governed by the same laws in theory. Am I right? A. You seem to have the right idea.

(19) J. F. D. says, in reply to A. E. & Co., who wish to augment the capacity of their flouring mill: You appear to be running the mill to a decided disadvantage. I would suggest that, instead of putting in another run of burrs, you run the ones you have up to their capacity. With the stones properly drafted and dressed, and run at proper speed, you ought to grind at least 15 bushels of wheat per hour on each run, and that will give the engine all it can do. I know it can be done, for I am averaging 20 bushels of wheat per hour on a 4 feet burr, and 35 bushels of corn on a 3 1/2 feet, running both at once and making a yield of over 42 lbs. of flour per bushel. Our engine is about the same size as the one mentioned, but we have a rather larger boiler.

(20) G. E. T. says, in answer to H. S. G., who asked if the cloth would not absorb more sulphuric acid in the mixture of 80 gallons water and 2 lbs. sulphuric acid than in half that quantity. The cloth, if thoroughly agitated and of any considerable quantity, say from 10 yards up, would absorb nearly the whole of the acid. I do not think there would be a loss of 10 per cent more acid by using the larger quantity than the smaller.

(21) J. H. N. says, to W. H. J., who asks us to explain how car wheels get round a curve: 1. A car wheel is some 2 inches larger on the inside, or next to the flange; and so the car wheels, in going round a curve, always run up to the flange on the outside of the curve, which of course is the longest rail, and so bring the inside wheel to bear on its small end. A. It must be evident that, unless all the curves of a road have the same radius, the curving of the wheels will not prevent slipping in some cases. 2. Why do the wheels and rails on the east side of north and south roads wear out the fastest? A. Experienced railroad men believe that this does not happen when a track is kept in proper order.

(22) H. E. E. says, in answer to W. H. F., who asks which car wheel slips in going round a curve: Neither. I have often seen a distiller roll his barrels to a warehouse some 50 yards away on two poles laid parallel about 2 feet apart; the barrels swayed from side to side and adjusted themselves automatically, and kept the track, although at one place there was an abrupt angle of 15° or 20°, which is worse than a regular curve