Business and Personal.

The Charge for Insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

The splendid Patent Hot Air Bath illustrated in this paper May 14, page 310, is offered very low.

Combination Roll and Rubber Co., 27 Barclay St., N. Y. Wringer Rolls and Moulded Goods Specialties. It drives diseasc away, is what every one says of Van Bell's " Rye and Rock."

Ladies can save the annoyance and expense of visiting a chiropodist by using German Corn Remover. 25 cents. Sewing Machines and Gun Machinery in Variety.

The Pratt & Whitney Co., Hartford, Conn. Wanted - A responsible business man would be pleased to represent a manufacturing company in Saft Lake City. Centrally located for Utah, Idaho, am Montana. Address J. P., Box 755, Salt Lake City, Utah. and

Houghton's Boiler Compound contains nothing that can injure the iron, but it will remove scale and prevent itsformation. Houghton & Co., 15 Hudson St., N. Y.

To Business Men. - An intelligent young man, of some business experience. would like a situation. Anything honorable. Unquestionable reference. Box 985, Providence, R. I.

Wanted -An old established machinery firm on Cortland street would be pleased to represent, in New York city, a firm or company manufacturing a variety of Engines, Boilers, etc. Address Engine. Box 773. New York.

Why risk boiler explosion from mud? It can be avoided, at nominal cost, by Hotchkiss' Mechanical Boiler Cleaner, 84 John t., N. Y. Engineers make ten per cent selling other parties than employers. Send for circular.

Lead Mine for Sale.-Undeveloped, but believed to be very rich. Short distance from St. Louis, Mo. Undivided half interest for sale to some one who will develop it. A fortune quickly made. Full particulars furnished only to those who have a few thousand dollars cash. Address W. W. Davenport, Oregon, Holt Co., Mo. Genuine GermanCorn Remover: not asalve, ointment.

or plaster. It eradicates the corn by four applications. Use the Vacuum Oils. The best car, lubricating, engine, and cylinder oils made. Address Vacuum Oil Co.

No. 3 Rochester Savings Bank, Rochester, N. Y. Wiley & Russell M'f'g Co. See adv., p. 333.

Tarred Roofing and Sheathing Felts. A. Wiskeman, Paterson, N. J.

Portable Railway Track and Cars. Contractors, Plant ers, Miners. send for circulars. Francis W. Corey & Co. 5 & 7 Dey St., New York; 59 & 61 Lake St., Chicago.. Ill.

Punching Presses & Shears for Metal-workers, Power Drill Presses, \$25 upward, Power & Foot Lathes, Low Prices. Peerless Punch & Shear Co., 115 S.Liberty St., N.Y.

Books on Practical Science. Catalogues free. Pocket Book of Alphabets, 20 cts. Workshop Receipts; a reli-able handbook for manufacturers. \$2, mail free. E. & F. N. Spon, 446 Broome St., N. Y.

Essay on Inventions.-What qualities will make them profitable, and how to incorporate these qualities in inventions. 25 cts. postpaid. Address N. Davenport, Valparaiso, Ind.

Improved Skinner Portable Engines. Erie, Pa.

"Rival" Steam Pumps for Hot or Cold Water; \$32 and upward. The John H. McGowan Co., Cincinnati, O. The Eureka Mower cuts a six foot swath easier than

a side cut mower cuts four feet, and leaves the cut grass standing light and loose, curing in half the time. Send for circular. Eureka Mower Company, Towanda, Pa. The Newell Universal Mill Co., Office 34 Cortlandt St.

New York, are manufacturers of the Newell Universal Grinder for crushing ores and grinding phosphates, bone plaster, dyewoods, and all gummy and sticky substances Circulars and prices forwarded upon request,

Pure Oak Leather Belting. C. W. Arny & Son, Manufacturers, Philadelphia. Correspondence solicited. Presses & Dies. Ferracute Mach. Co., Bridgeton, N.J. Wood Working Machinery of Improved Design and

Workmanship. Cordesman, Egan & Co., Cincinnati, O. Experts in Patent Causes and Mechanical Counsel. Park Benjamin & Bro., 50 Astor flouse. New York.

Split Pulleys at low prices, and of same strength and appearance as Whole Pulleys. Yocom & Son's Shafting Works. Drinker St., I'biladelphia, Pa.

Malleable and Gray Iron Castings, all descriptions, by Erie Malleable Iron Company, limited, Erie, Pa.

National Steel Tube Cleaner for boiler tubes. Adjust able, durable. Chalmers-Spence Co., 10CortlandtSt., N.Y. Corrugated Wrought Iron for Tires on Traction Engines, etc. Sole mfrs., H. Lloyd, Son & Co., Pittsb'g. Pa.

Best Oak Tanned Leather Belting. Wm. F. Forepaugh, Jr., & Bros., 531 Jefferson St., Philadelphia, Pa.

Stave, Barrel, Keg, and Hogshead Machinery a specialty, by E. & B. Holmes, Buffalo, N. Y.

Wright's Patent Steam Engine, with automatic cut The best engine made For prices, address William

For Sale.-13 x 30 and 16 x 48 inch Horizontal En. Sines, complete and in good order. Prices, \$700 and \$550 respectively. 25, 35, and 80 H. P. Locomotive Boilers, \$425, \$5 . and \$325. Extra No. 1, 22½ inch, 8 roll, 4 side (Schenck) Planer and Matcher, in perfect order, \$1,200. 70 feet 31/2 inch Shafting, with Hangers, Pulleys. and Couplings, 5cts. Beicher & Bagnall, 40 Cortland St. Peck's Patent Drop Press. See adv., page 366.

Fire Brick, Tile, and Clay Retorts, all shapes. Borgner

& O'Brien, M'f'rs, 23d St., above Race, Phila., Pa. Silica Paints (not mixed); all shades. 40 Bleecker St.,

N.Y. Turbine Wheels; Mill Mach'y. O.J.Bollinger, York, Pa. For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Co., Buffalo, N. Y.

The Brown Automatic Cut-off Engine; unexcelled for orkmanship, economy, and durability. Write for information. C. H. Brown & Co., Fitchburg, Mass.

The None-such Turbine. See adv., p. 350. Brass & Copper in sheets, wire & blanks. See ad, p. 365

The Chester Steel Castings Co., office 407 Library St., Philadelphia, Pa., can prove by 15,000 Crank Shafts, and 10.000 Gear Wheels, now in use, the superiority of their Castings over all others. Circular and price list free. Wren's Patent Grate Bar. See adv. page 365.

Diamond Engineer, J. Dickinson, 64 Nassau St., N.Y. The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Eagle Anvils, 10 cents per pound. Fully warranted. Geiser's Patent Grain Thrasher, Peerless, Portable, and TractionEngine. Geiser M'f'g Co., Waynesboro. Pa. Houston's Four-Sided Moulder. See adv., page 364.

Long & Allstatter Co.'s Power Punch. See adv., p. 365. For Mill Macb'y & Mill Furnishing, see illus. adv. p.364. For Mining Mach'y, see ad. of Noble & Hall, p. 366.

New Economizer Portable Engine. See illus. adv. p. 365. Rue's New "Little Giant" Injector is much praised for its capacity, reliability, and long use without repairs. Rue Manufacturing Co., Philadelphia, Pa.

Saw Mill Machinery. Stearns Mfg. Co. See p. 364. Saunders' Pipe Cutting Threading Mach. See p. 366. For Shafts, Pulleys, or Hangers, call and see stock kept at 79 Liberty St., N. Y. Wm. Sellers & Co.

Wm. Sellers & Co., Phila., have introduced a new injector, worked by a single motion of a lever. For Sequeira Water Meter, see adv. on page 364.

Toope's Pat. Felt and Asbestos Non-conducting Removable Covering for Hotor Cold Surfaces; 'Foope's Pat. Grate Bar. C.Toope & Co., M'f'g Agt., 353 E. 78th St., N.Y. Use Vacuum Oil Co.'s Cylinder Oil, Rochester, N. Y. Don't buy a Steam Pump until you have written Valley Machine Co., Easthampton, Mass.

For Machinists' Tools, see Whitcomb's adv., p. 364



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unles accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers. We renew our request that correspondents, in referring

to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from \$1 to \$5, according to the subject, as we cannot be expected to spend time and labor to

obtain such information without remuneration. Any numbers of the SCIENTIFIC AMERICAN SUPPLE-

MENT referred to in these columns may be had at this office. Price 10 cents each.

(1) A. A. R. asks if either gun or powder is injured by leaving the gun loaded, the gun being the ordinary iron barrel. A. If the gun is not perfectly clean (freed from the remains of burnt powder) and well oiled it is not well to leave the charge in any length of time. 2. I want a simple test for cistern water to tell whether or not there is sewer poison in it. A. Dissolve in a pint of distilled water half an ounce of pure tannic acid and filter the solution through filter paper into a clean bottle. Dissolve in another pict of distilled water a quarter of an ounce of pure permanganate of potash, and filter into a clean bottle as before. Draw off two separate pints of the well water in clean clear glass bottles; add to one about two fluid ounces of the tannin solution, put a new stopper in the bottle, and it agid for fort a few drops of the permanganate solution (just enough to impart a distinct pink tinge), and note the colorfade out at once or on standing haif an hour. Add to another sample of the cistern water a few drops of a filtered solution of a quarter of an ounce of pure nitrate of silver in a gill of distilled water, and note whether a white precipitate or an opalescent cloudiness forms immediately or on standing half an hour in the dark. If an appreciable quantity of sewage is present in the water the tannin will occasion a flocculent or curdy precipitate, at first a mere cloud, which finally settles to the bottom as a distinct precipitate. In the permanganate test the color imparted will soon fade out if it does not do so at once. The white precipitate or cloud forming on the addition of silver nitrate also indicates the presence of contaminating substances, especially if the other tests are positive. If the tannin and permanganate reactions indicated are marked the water is unfit for potable purposes.

glue to use for cigarettes ? I have used flour paste, but it is not quick enough. The glue must not discolor the paper, and when dry must not show. Could you inform me what is used by the manufacturers of cigarettes ? A. Thick starch paste free from lumps and containing a trace of clove oil to keep it sweet answers admirably.

(4) H. C. F. asks for a receipt for packing eggs in summer to keep for winter. A. Dip the eggs in a solution of 2 oz. gum arabic in a pint of cold water, let them dry and pack in powdered well burned charcoal.

(5) C. H. H. asks how to make potash ater glass ? A. Potash water glass is prepared by intimately mixing two parts, by weight, of pure white silicious sand or clear quartz, and six parts of anhy drous carbonate of potash, all ground to a very fine powder, and melting the mixture in a large clay crucible at a bright red heat. Carbonic acid gas is given off rapidly, and as soon as this ceases and the mass is in a state of calm fusion it is poured out on an iron plate to cool. This glass dissolves readily in boiling water, and on cooling the solution a sirupy liquid is obtained. This is the potash water-glass referred to.

(6) C. J. H. asks (1) how aniline is prepared and shaped which is used with the indelible writing pencils. A. A mixture of chalk and kaolin is made into a stiff paste with a strong aqueous solution of aniline violet (or other soluble aniline dye) containing a little gum dextrine, pressed into shape and slowly dried. 2. How to make brass, such as is used for cheap rings and sleeve buttons, that will keep its luster and not make the fingers and cuffs black ? A. We know of no practical way. 3. How celluloid is prepared and put on linen such as is used for waterproof collars and cuffs? A. Celluloid is composed of nitrocellulose or soluble cotton combined with camphor by means of strong pressure and heat, under which conditions it is quite plastic.

(7) A. K. asks: 1. Does water ever get too cold to freeze ? It'so, under what circumstances does it pass the freezing point without congealing ? A. At a temperature of about 32º Fah. pure water congeals under all circumstances. 2. Is the sugar that is in the maple sap taken from the ground, or is it manufactured from the material taken from the ground by the organs of the tree ? A. A portion of the substances of which maple sugar is composed is derived from the soil, and a larger port on from the air. The sap is formed by chemical reactions within the tree. 3. Will evaporation be more rapid if a lid be placed over vessel while boiling ? A. No; the contrary.

(8) J. D. S. asks how to make brick burn a dark color. I have been using coal dust, which does not prove satisfactory. I have an amount of fire clav among the clay, which, when moulded, burns a very light color. A. Spray the clay while mixing with a small quantity of a solution of 1 lb. common green copperas in 4 gallons of water. Or use as a cheap substitute for this, ordinary acetate of iron liquor.

(9) J. S. H. writes: I have a large marble slab, with two large hair oil stains on same. What can I use to take out the oil or to make it all oil? Have tried several oils but with no effect ? It has been on for six years, and has soaked through. What is a cheap way to fix it ? A. Make dry slaked lime into a paste with one ounce of washing soda dissolved in half a pint of hot water. Rub this into the spots and let it remain on over night. Then wash off with clean water. Repeat if necessary.

(10) C. W. K. asks how to remove common black ink from parchment. A. Moisten the spots first with a strong solution of oxalic acid, then with a clear saturated aqueous solution of fresh chloride of lime (bleaching). Absorb excess of the liquids from the paper as quickly as possible, with a clean piece of blotting paper. Repeat the treatment if necessary, and dry thoroughly between blotting pads under pressure.

(11) C. L. asks: Can you tell me how to dissolve rubber so as to make rubber stamps? A. The rubber is not dissolved. See "How to Make Rubber Stamps," SUPPLEMENT, No. 83.

(12) H. E. writes: I have some receipts for making colored fires; among them are some articles termed meal powder and Chertier's copper. What are these substances ? A. The first is gunpowder reduced to a fine flour; the second, fine copper filings made into a paste with an equal weight of finely powdered potassium chlorate and enough hot water, then thoroughly dried.

(13) W. W. asks about what steam pressure a mercury flask will stand. Will it be safe to put 40 to 50 lb. pressure in them? A. It will be safe at three times 40 or 50 lb.

(14) "Subscriber" asks: What would be the cheapest and best style to make a boiler for an engine 11/2 inch cylinder, 3inch stroke; whether apright or horizontal, and of what material? Also, would oil lamp or lamps give out sufficient heat, and what part of a horse would the above be? A. A vertical tubular boiler of iron. Petroleum or kerosene lamps might be arranged to heat it. Engine would be balf horse power to one horse power, according to steam pressure and velocity at which it is run; 2 inches by 4 inchescylinder would be about double the power. (15) C. E. T. asks: Is there any difference between the power required to punch a hole in iron one inch in diameter and one inch thick, and the power required to punch a hole two inches in diameter and onehalf inch thick ? A. According to the result of experiments, the power required for punching iron plates is directly as thearea of the boundary of the hole, or as the circumference multiplied by the thickness. (16) J. D. S. writes: My engineer and I are in dispute on the following points, and appeal to you for an opinion. We wish to draw water from a stream to the sugar house, four hundred yards distant. Have a Blake pump, and will use a three-inch iron pipe for the suction. From the level of the water to the pump is 20 feet perpendicular. From the level of the water to the top of bank, near the stream, is 22 feet. Now, will it be better to lay the pipe with a gradual fall throughout, from the pump to the water, or to make a perpendicu- | SCIENTIFIC AMERICAN, for December 11, 1880, vol. xlni.

(3) A. V. R. asks: Can you tell me of | lar lift at the stream which will carry it over the bank, and then fall gradually back toward the pump, which is two feet lower than the top of the bank near the stream? My engineer says it should be put with the fall from pump to water, and use thin check valves in the length of the pipe. I hold the contrary opinion, and especially that more than one check valve is worse than useless, as it is only an additional weight for the pump to lift. He insists that he can, by laying a pipe as he says, and with several check valves, make a pump raise water forty feet perpendicularly with ease. A. If the plpe is tight, it makes little difference which plan is adopted. Your engineer is "all wrong" in saying that he can lift the water 40 feet by using a number of check valves. A multiplicity of check valves increases the difficulty.

> (17) J. R. D. asks: 1. What is the best lubricant for two wood surfaces ? A. Pure refined tallow or lard, with a little black lead, 2, What is the formula for finding the theoretical horse power of a given head of water? A. One horse power is 33,000 lb. lifted 1 foot high per minute. For water power multiply the weight of water falling over the dam per minute by the amount of fall and divide by 33,000, the result is the theoretical horse power. When applied to water wheels the net power is from 60 to 80 per cent, according to the kind and perfection of the wheel.

> (18) G. E. asks: How can I make the socalled liquid slating for blackboards ? A. Shellac, 1 lb ; borax, 41b.; water, 416 gallons Heat the water to boiling, add the borax, and when this is dissolved gradually add the borax, and continue the boiling until the latter is dissolved; then introduce lampblack, 2 oz.; silicate of soda (a sirupy solution), 8 oz.; fine silica, 1/2 lb. Stir well together and add enough hot water to reduce it to the proper consistence for use.

> (19) S. C. D. asks if brass pipe for conducting water for domestic use would be safe; would water so conducted and at times standing in brass conducting pipes, be perfectly free from any poisonous or injurious properties, and positively safe to use? A. Brass is not a proper material for pipes conveying potable water. Water that has remained in such pipes for any length of time is not fit to drink or for cooking. Use iron or wood pipes.

> (20) M. R. P. writes: I am painting with oil colors on gold and silver leaf. To preserve the brightness of the painting some kind of varnish is necessary. What kind can I use so as not to damage the gold or silver leaf ? A. Photographer's clear plain collodion answers very well.

> (21) W. H. B. asks: Is there anything that will neutralize the oxide of iron in glass sand, which in melting renders the glass dark colored and full of sand or small blisters ? A. The introduction of a little oxide of manganese will improve though it will not eradicate the color. Fine glass cannot be made from such sand.

> (22) G. M. P. asks: What is the proportion of coal to the amount of glass melted in the manufacture of glass table ware? A. In the old method of melting glass it required 11/2 pounds of coal to melt a pound of glass; in Germany, where coal is expensive, the glass manufacturers claim to be able to melt a pound of glass with a pound of coal. There are glass melting furnaces running successfully in Pittsburg. which melt seven pounds of white glass for table ware with one pound of coal.

(23) E. W. M. asks: What is the nutritive value of fish as food as compared with other articles of flesh diet ? A. According to ProfessorAtwater: Taking medium beef at 100, we should have, as the nutritive value of like weights of fish free from bone: Medium beef, 100; fresh milk, 23 8; skimmed milk, 18.5; butter. 124; cheese, 155; hens' eggs, 72; codfish, fresh, 68; flounders, 65; halibut, 88; lake trout, 91; eels, 95; sbad, 99; salmon, 104; salt mackerel, 110; dried codfish, 346.

(24) R. H. asks: Are there any coal mines successfully worked under the sea? A. A number of English coal mines are being worked under the ocean, In Northumberland the net available quantity of coal under the sea is estimated at 403,000,000tons, and on the Durham coast under the sea, including a breadth of three and a half miles with an area of seventy-one square miles, 734,500,000 tons. The latter mine is in a vein of an aggregate thickness of thirty feet, distributed in six seams.

(25) T. A. W. asks how much lap there is on the steam and exhaust valves of the Corliss engine; also, if there is any way of setting the valves except to take off the cylinder heads. A. The lap is different in the different sizes of engines and engines running at different velocities. You can set the valves by having the position of the openings and the section of the valve marked at some proper place on the outside.

Wright, Manufacturer, Newburgh, N. Y.

Nickel Plating.-Sole manufacturers cast nickel anodes, pure nickel salts, importers Vienna lime, crocus, Condit. Hanson & Van Winkle, Newark, N. J., and 92 and 94 Liberty St., New York.

Presses Dies, Tools for working Sheet Metals, etc. Fruit and other Can Tools. E. W. Bliss, Brooklyn, N. Y. Cope & Maxwell M'f'g Co.'s Pump adv., page 332. The I. B. Davis Patent Feed Pump. See adv., p 332. Moulding Machines for Foundry Use. 33 per cent saved in labor. See adv. of Reynolds & Co., page 334.

Machine Knives for Wood-working Machinery, Book Binders, and Paper Mills. Also manufacturers of Soloman's l'arallel Vise, Taylor. Stiles & Co., Riegelsville.N.J. Skinner's Chuck, Universal, and Eccentric, See p. 333 Blake " Lion and Eagle " Imp'd Crusher, See p. 350. Gardiner's Pat. Belt Clamp. See illus. adv., p. 349. For best Duplex Injector, see Jenks' adv., p. 349. C. B. Rogers & Co. Norwich, Conn., Wood Working Machinery of every kind. See adv., page 349, Eclipse Fan Blower and Exhauster. See adv., p. 348. The Sweetland Chuck. See illus. adv., p. 349. 4 to 40 H. P. Steam Engines. See adv. p. 349.

(2) F. B. asks: How can I keep a tent made of thin cotton cloth from mildewing without coloring the cloth ? A. Saturate the cloth first with a solution of soap and then with a strong aqueous solution of lead acetate or alum. Let it partially dry, then rinse with clean water.

(26) W. L. asks why the screw propeller is used in preference to the paddlewheel for ocean navigation. A. Because: 1. The machinery weighs less and occupies less room than for paddlewheels 2. Its propelling power is not so much affected by the varying draught of water. 3. Its propelling effect is not reduced in a sea way and by the rolling of the ship as is the case with paddle wheels. 4. It is much less liable to damage from heavy seas.

(27) J. B. asks if an engine of the following dimensions is well proportioned: (lylinder 7x20, with a two-flue boiler. What is the horse power of such engine and what sized boiler is required ? A. Your proportions are very good, unless you wish to run at a high velocity, then a shorter stroke will be better. The engine, will develop about 23 horse power at 120 revolutions per minute. Boiler 38 inches diameter by 23 feet long, 2 flues 12 inches diameter. Of the speed of the engine is less than 120, a smaller boiler will answer.

(28) W.E.F.L. asks: What is the cheapest way to magnetize small steel bars to saturation ? The bars are from 2 to 3 oz, in weight. A. You will find full information on this subject on page 379 (36),

iron so that it can be filed and fitted easily. The cast- water is a good height above the pump. Write the ings we want to use are so thin that heating breaks manufacturers of your pump. them. A. The metal may be superficially softened by packing the pieces in dry oxide of iron or powdered hematile iron ore in an iron box, heating the whole to magnetize steel bars is to place them centrally in redness and keeping up the heat for twenty-four hours or more. The contents of the box must be allowed to cool down slowly

(30) T. M. inquires as to the action of glue on porcelain, when allowed to dry in a porcelain evaporating dish. The glue causes the glazing to crack and flake off. I placed some glue in a glass vessel, and found that when it solidified and contracted it caused the glass to flake. If this is a common case I have failed to notice it before. Is it due to mechanical action alone ? A. The fiaking of porcelain and glass surfaces by glue in drying has been frequently noted. The only requisite is that the glue be strong and hot and the yessel clean. It is due to mechanical action .- Your minerals were reported under appropriate headings in a recent issue.

(31) C. H. asks for a good work on amalgamating and milling. We are running over silver plated copper plates, using cyanide of potassium to clean with, but cannot get the plates in good order, the quicksilver running off. Whatshould we use to prevent this? A. Consult Percy's "Metallurgy of Gold and Silver." Address the book dealers who advertise in this paper. Wash the plates with a strong hot aqueous solution of caustic potash. Rinse off thoroughly with water, then try the mercury, with a little dilute nitric acid if necessary, at first.

(32) J. H. asks: 1. Is it lawful for any one to make apatented article, without permission from the owner of the patent, providing the person makes it for his own use solely, and not to sell? A. Any one may make a patented article for experimental purposes, but notfor actual use. See "Rights of Investigators," page 128, vol. xxxix. 2. What would be proper size, bore of cylinder, and stroke for engine of steam launch, 33feet keel. 8 feet beam, to make seven miles an hour? A. 7 to 8inch cylinder by 8 inch stroke. 3. The amount of pipe necessary to make a coil boiler for such an engine? A. There should be pipe enough in coil boiler to give not less than 300 feet surface.

(33) W. F. K. writes: I have a small stream of spring water about 20 inches square, or rather 20 square inches as it runs, that is 10 inches wide and 2 inches deep, could raise the head to 20feet high. Would like to know the best water wheel to get, and what would be the greatest amount of power that could be got out of the water under a 20 foot head? A. We cannot tell asything about the power, as you do not give the quantity of water per unit of time. A turbine is the best wheel for you. Address dealers who advertise in our columns

be affected or made to go faster, on account of its owner taking shocks from a small induction coil? A. No. 2. Can an induction coil be compared to a dynamic machine for lights? A. No, it would be impossible to under the retort with caution to avoid too ranid a dissubstitute one for the other. An induction coil is not engagement of the oxygen until no more gas comes adapted to electric light purposes

(35) W. C. B. writes: 1 have tried to put up an acoustic telephone, from office to dwelling, dis- wash for out-of-door work. A. For brickwork exposed tanceabout 200 feet, and cannot get it working satisfactory. There seems to be too much vibration or buzzing noise in the diaphragm, as though the words spoken could not get out fast enough. Will you please state through correspondence column, SCIENTIFIC quantity of boiling water, and a thin smooth paste, also AMERICAN, where the fault lies? My boxes are 6x6x6 hot, made from 1 pound fine rice fiour; also one-quarter inches, with drumhead diaphragm 6 inches square, forming a slight cone, with a cover over the front and around hole of 41/2 inches in that cover, forming a small chamber in front of diaphragm of about half an inch. Back of diaphragm I have packed cotton to partly take . Heat to boiling, stir, and apply hot. The above proporaway that vibration. I use common iron wire insulated with string (wire is about one-thirty-second of an inch thick), forming four right angles. Wire is moderately (15), vol. 39, and 299 (24) and 28 (46), vol. 38, SCIENtaut and does not touch anywhere but the diaphragm and strings to form the angles. There seems to be no difficulty as to quantity of noise: we can hear that very plainly 20 feet away from box; only as to distinctness we have experimented every way, and cannot strike the examined, with the results stated: right thing. A. Your diaphragm is too large. Make it from 2 to 2.1/2 inches in diameter, of thin sheet iron traces of gold.-A. M.-A variety of bituminous coal (ferrotype plate) or tin, and turn your corners with an containing much sulphur.—E. S. H.—1. Encrinites or angle less acute than a right angle; that is, use two or stone lilies. 2. Niagara limestone. 3. Fibrous talc. three suspenders at the corners instead of one.

(36) Dr. N. J. S. writes: When sheets, handkerchiefs, and other linen or cotton fabrics are soiled with vaseline, and afterwards washed in soap suds or boiled in lye. the staindisappears. When the articles are ironed, however, the heat causes the stain, which looks like a grease spot, to reappear. Neat patients complain that their bed linen and clothing is thereby rendered unfit for use. What is the remedy A. The best way is to put the stained pieces to soak for ten or fifteen minutes in a quantity of deodorized Letters Patent benzine (a common commercial article) sufficient to completely cover them. Wring out and hang up the pieces for about ten minutes, when they will have dried sufficiently to put in the soap suds. AND EACH B (37) J. A. D. writes: I have a Niagara pump. 4 inches suction and 2 inches discharge and I cannot make it pump hot water it pumps cold water all right. Can it be made to pump hot water ? The valves and rings are all metal. The heater is an old boiler (with since 1866.will be fur the flues taken out and the ends closed up), 24 feet long. patent desired and 40 inches diameter, and the exhaust goes through it. Cold waters pumped into the heater with a Blake pump. granted prior to 1866 The heater sits 4 feet above the pump, and it is to supfications not being p ply seven boilers 25 feet long, 40 inches dameter, with two flues carrying 90 lb, of steam. As soon as the water gets hot in the heater, after running half an hour it : Air brake apparatus pounds bad and blows out the packing from the water Animal tran, J. Quig cylinder. I took off the air chamber, and it worked a Annunciator index. little better, but n ot much. A. The hot water produces a vapor in the pump which prevents the valves from Axle. wagon, J H. & acting, especially if there are large vacant spaces in the Bag machine, D. Ap pump; it would work better if the tank were 10 or 12 Bahng press, P. K. feet or more above the pump instead of 4 feet; any Band wheel, J. W. M

(29) W. B. R. asks how to soften hard cast good force pump will pump hot water if the supply of

(38) H. O. asks how to charge horseshoe and bar magnets. A. The quickest and best way to a suitable coil, and then connect the helix with the wires from a dynamo-electric machine or powerful battervfor a few seconds, remembering to break the current before removing the magnet from the coil. If the source of the current is a dynamo machine, the coil should be about 2.½ inches long, and should consist of tenor twelve layers of No. 12 magnet wire. If a battery is used, a coil 11/2 inches long, composed of fourteen or sixteen layers of No. 16 magnet wire will be the best. The internal diameter of the coil should be only large enough to admit the bars easily. A battery of six Grenet elements, each having an effective zinc surface of 30 square inches connected in series, will do the work very well on small magnets; such, for instance, as are used in telephones. Where a number of magnets are to be made at one time the bars may be passed in a continuous line through the coil, always keeping three bars in contact end to end, adding one above the coil before taking one off below. In this manner sixty bar magnets have been strongly charged in ten minutes. Horseshoe magnets cannot be charged so readily. There are two or three ways of charging them. One way is to place them in contact with the poles of a very strong electromagnet, removing them after breaking the current; another method is to place each limb of the magnet in a coil adapted to the current to be used; and still another method is to employ a single coil, inserting one pole of the magnet into the coil in one direction, thus breaking the current, and inserting the other pole into the coil from the opposite direction. It is well to remember that the magnet will be very much impaired if the current is not broken before removing it from the coil. The secret of success in charging magnets is to have a strong current It is impossible to make magnets satisfactorily without this all-important requisite. As to the quality of steel best adapted to this purpose, machinery steel, hardened and not tempered, answers admirably. For horseshoe magnets German spring steel is the best. Tool steel answers well if hardened and drawn to a straw color. The steel receives its maximum charge almost instantly. It is useless to allow it to remain under the influence of the magnetizing current more than a few seconds.

(39) E. R. T. asks how to make pure oxygen gas. A. Mix pure crystallized potassium chlorate with about one-quarter its weight of pure black oxide of manganese, and heat the mixture in a copper retort, with large delivery tube, until the gas begins to come over. Conduct the gas through a large empty bottle (to avoid accident by back pressure), then through a strong solution of iron sulphate (copperas), and then through an iron tube several feet in length, filled loosely with fresh quicklime in granular lumps (free from dust). (34) M. F. J. asks: 1. Can a reliable watch Collect in a rubber bag. An ordinary mouthpiece an swers well enough if the air from the lungs is expelled through the nostrils, or so as not to contaminate the contents of the bag. The heat should be continued

> (40) O. E. C. asks for a receipt for whiteto damp take one-half peck well burned quicklime, fresh from the kiln, slake with hot water, enough to reduce it to a paste, and pass it through a fine sieve; adda gallon of clean white salt which has been dissolved in a small pound best white glue, made in the water bath. Mix together, stir well, and one-quarter pound best Spanish whiting in 5 quarts boiling water, stir, cover over to retain heat and exclude dust, and let it stand a week tions will cover 40 square yards. 2. Also the best way to refine cider for family use? A. See pp. 394 (7) and TIFIC AMERICAN.

MINERALS, ETC.-Specimens have been received from the following correspondents, and

F. C. R.-Iron pyrites-sulphide of iron--contains -R. McA.-A variety of fine silicious clay.

COMMUNICATIONS RECEIVED. On the Mound Builders. By W. O. C.

[OFFICIAL.]

patent in the annex

Atomizer, A. F. Ellio Axle, carriage, H. K

American.	-	
Barb making machine. M. W. Watkins Barrel trussing machine, E. & B. Holmes	241.139	G
Beading machine, C. M. Rohn		G
Bed bott om, spring woven wire, Dunks & Ryan Bed, folding, E. S. Griffith	241,321 241.210	6
Bed, folding cot, E. S. Griffith	241,356	6
Belt, grain conveyer, L. R. Fix Belt, sand, J. Obart	241,340 241,152	G E
Belting, A. E. Foth	241,132	H H
Blasting powder, T. P. Sleeper Bleaching and dyeing cotton, process of and appa-		ł
ratus for, F. Wilkinson Bilge water, apparatus for discharging, J. J. De	241.464	E E
Kinder		E
Boiler furnace, steam, H. McElroy Boiler furnace. steam, O. D. Orvis	241,392 241,153	I I
Bookcase, revolving, J. Danner Boot and shoe guard, D. A. McDonald	241,123	I
Boot and shoe soles, machine for moulding, J. B.	×41,001	ŀ
Johnson Boot and shoe tip, J. W. Rogers		I I
Boot cleaner, J. W. Dowler	241,318	ŀI
Bottle cooler, W. Keech		F
Bottles, crate or basket for carrying, J. Close	241,303	1 F
Boxes and cases, provision and other, F. S. Colas. Bridle bit. R. W. Jones	241,141	
Buckle, tug. J. S. Nelson Burialcaskets, outer case for, G. W. Boyd.	241,403 241,282	I I
Cable ways, switch for endless, H. Casebolt	241,299	I
Can, nozzle, J. W. Farrell Can sealing apparatus, U. A. Woodbury241,264		ł
Cane and umbrella, combined, M. A. Dees	241,312	E E
Cap and process of manufacture, D. W. Northrup Car and feeding device, stock, J. A. Haydon	241,359	F
Car brake, automatic, D. S. Randolph Car brake reel attachment, I. H. Randall		I I I
Car coupling, W. J. Stethem	241 ,1 65	I H
Car, stock, H. Illoway et al Car, stock, I. Kitsee et al		F
Car, stock, M. F. Seeley	241, 1 61	1 1
Carbon black, manuf. of, J. Howarth (r)9,696, Card cutter, A. Johnson	241,372	E
Carriage curtain fastening, F. J. Flowers Carriages, parasol attachment for children's, J.	241,342	ł
A. Crandall		E I
Cart, self-loading, J. L. Hubbard Chain, ornamental. H. A. Church		I
Chandelier for burning oil, A. P. Steinmeyer Churn power, C. M. Trautmann.	241,440	I
Churns, etc., cover fastening for, Davis & Mister.		1 1
Cigar bunches, machine for assisting in making, A. C. Schutz	241.160	Ī
Cigarette machine, pocket, H. W. Thurston	241,250	I
Clutcb, automatic, C. J. B. Ward Coffee, etc., machine for cleaning, scouring, and	241,460	. I T
polishing, J. Burns		ſ
Collyrium, M. S. Judah	241,222	I
Comb, P. H. Drake Comb, J. Hart		Ī
Comforter, H. A. Stearns Compounds for treatment of piles, making, A. W.		Ί
Brinkerhoff	241,288	I
Cone press, J. Selwig Cenveyer, H. A. Barnard		
Cork cutter, R. S. Noyes	241,151	N D
Corn husker, field, C. A. Pennington Cornice, window, J. M. Montgomery, Jr	241,414 241,400	n 1
Corset, W. J. Brewster Corset, J. A. Ordway		1
Cotton picker, A. R. Nixon	241,406	1
Crozing machine, R. B. Mitchell Cuff or wristlet, I. B. Kleinert	241,252	
Cultivator, Brenner & Fraser Cultivator, sulky, N. Dulaney	241,250	
Outdown had a C D Wilson	044 1075	1
Cutter frame, W. Bruening Cutter, head, G. J. & S. J. Shimer		N - 7
Cylinders, machine for straightening and holding sheet metal, D. Rolston		1
Desk and bedstead combined, E. G. Wheeler	241,173	1
Door check, J. H. Coffman Drums, hook attachment to, E. J. Cubley		Ŋ
Ear jewels, fastening for, G. W. Washburn	241,462	1
Earring fastener, G. Krementz241,381, Edible composition, L. M. Haskins	241,382 241,357	1
Ejector, air. F. W. Eames	241,334	(
Electric machine, dynamo, W. Elmore	241,198	0
Electric machines, armature for dynamo, Sawyer & Knowles		I I
Electric wires and lamps in cities, support for,		1
W. C. Allison End gate, wagon, A. C. Badgley	241,117	1
End gate, wagon, W. Emery Evaporating pan, J. E. Weaver	241,199	. F
Evaporating saline and other liquids, process of]]
and apparatus for, J. E. Weaver	241.257 241.191	1
Faucet, filtering, W. M. Sack	241,427	
Feed rack, F. A. North Fellies, machine for troughing metal plates for		
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T. V. Allis	241,271	H H
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Fifth wheel, vehicle, J. J. Cobb Fifth wheel, vehicle, J. G. Ebken	241,120	· 1
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FOR WHICH	File, bill, J. E. Gorman 241,350	Pitcher, ice, J. H. Brown 241,291
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$N_{-} = 10, 1001$	Finger ring, D. Untermeyer 241,453	Planter, corn, B. P. Snyder 241,435
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AND EACH BEARING THAT DATE	Firearm, revolving, A. L. Sweet (r) 9,704	Planters, check line guide for corn, G. D. Haworth 241,358
		Post office drawer, Steinmetz & Chambers 241,439
[Those marked (r) are reissued patents.]	Beers	Preserving can, C. H. Fry, Jr 241,204
	Fishing seines or nets, float for, G. Norwood 241,150	Printing machine, S. D. Tucker 241.168
A printed copy of the specification and drawing of an	Flower holder, C. A. Fautz 241,201	Printing press, C. B. Cottrell (r)
patent in the annexed list, also of any patent issued	Flower pots, wire window rack for. H. R. Van Eps. 241,454	Printing press, oscillating, F. H. Richards 241,421
ince 1866. will be furnished from this office for one dol-	Fluted trimmings, machine for making, Kersten	Processing apparatus, F. C. Nicodemus 241.405
ar. In ordering please state the number and date of the	& Schaupp 241,143	Profile gauge, D. Ruge
atent desired and remit to Munn & Co., 37 Park Row	Fruit drier, G. C. De Lametter 241.314	Propeller blade, perforated, H. D. Deane 241,121
New York city. We also furnish copies of patents		
ranted prior to 1866; but at increased cost. as the speci-	Fruit in boxes, machine for packing evaporated,	Pump, force, C. Verniaud 241,455
ications not being printed, must be copied by band.	N. S. Gilbert 241,348	Pumps, gearing for operating a series of, F.
	Furnace door attachment, A. J. Simmons 241,433	Crocker
Advertising inkstand, A. I. E. Knight 241,380	Furnaces, sawdust feeder for. M. Garland (r) 9.695	Rag picking macbine, T. Kershaw 241,375
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