

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 right to manufacture the balanced reciprocating counterweight engine, illustrated on page 338, is for sale. Perfectly balanced, and needs no flywheel nor foundation. They are entirely free from vibrations. For further particulars apply to Chas. Louque, patentee, 31 Carondelet St., New Orleans, La.

John Kennedy & Co. build high and low pressure steamships and launches with the latest improved Louque's patented balanced reciprocating engine, free from vibration. High speed guaranteed. Photographs of the Leader, 40' length by 8' 6" beam, sent on receipt of 25c. Address John Kennedy & Co., 31 Carondelet St., New Orleans, La.

Walrus Leather, Emery, Glue, and Manufacturers' Supplies generally. Greene, Tweed & Co., 83 Chambers St., New York.

Wanted—Patented novelties to manufacture on royalty, or would purchase patent outright. Household or articles in general use preferred. Address, with full particulars, Hardware, Plantsville, Conn.

Montaigne speaks of "reposing upon the pillow of a doubt." Better repose upon the certainty that Dr. Pierce's "Favorite Prescription" will cure all chronic female diseases with their attendant pains and weaknesses.

DEAR SIR—Your "Favorite Prescription" has worked wonders in my case. It gave immediate relief.

MRS. M. GLEASON, Nunica, Ottawa Co., Mich.

Complete Practical Machinist, embracing lathe work, vise work, drills and drilling, taps and dies, hardening and tempering, the making and use of tools, tool grinding, marking out work, etc. By Joshua Rose. Illustrated by 356 engravings. Thirtieth edition, thoroughly revised and in great part rewritten. In one volume, 12mo, 439 pages. \$2.50. For sale by Munn & Co., 361 Broadway, New York.

Blake's Improved Belt Studs are the best fastening for Leather or Rubber Belts. Greene, Tweed & Co., New York.

Apparatus for replacing broken pump chains without disturbing the pump or cistern cover. Individual, city, and State rights for sale by J. B. Brown, patentee, Hannibal, Mo.

The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Concrete patents for sale. E. L. Ransome, S. F., Cal.

Wanted—Competent draughtsmen, experienced in blast furnace and steel works construction. State experience. Address G. S. L., P. O. box 773, New York.

Small Metal Goods of every description made to order. Die work, etc. E. C. Ivins, 528 N. 10th St., Phila., Pa.

Machinist Foreman wanted who can handle fifty men to advantage and increase their production by latest improved ways of doing work. Address P. care of Wilkinson & Co., 352 Atlantic Ave., Boston, Mass.

Friction Clutches from \$2.25 on. J. C. Blevney, Newark, N. J.

Haswell's Engineer's Pocket-Book. By Charles H. Haswell, Civil, Marine, and Mechanical Engineer. Giving Tables, Rules, and Formulas pertaining to Mechanics, Mathematics, and Physics, Architecture, Masonry, Steam Vessels, Mills, Limes, Mortars, Cements, etc. 900 pages, leather, pocket-book form, \$4.00. For sale by Munn & Co., 361 Broadway, New York.

Woodworking Machinery of all kinds. The Bentel & Margedant Co., 116 Fourth St., Hamilton, O.

A Catechism on the Locomotive. By M. N. Forney. With 19 plates, 227 engravings, and 600 pages. \$2.50. Sent on receipt of the price by Munn & Co., 361 Broadway, New York.

Guild & Garrison's Steam Pump Works, Brooklyn, N. Y. Pumps for liquids, air, and gases. New catalogue now ready.

The Knowles Steam Pump Works, 44 Washington St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

Nickel Plating.—Sole manufacturers cast nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro-Plating Machine. Sole manufacturers of the new Dip Lacquer Kristalline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn.

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

Planing and Matching Machines. All kinds Wood Working Machinery. C. B. Rogers & Co., Norwich, Conn.

Iron and Steel Wire, Wire Rope, Wire Rope Tramways. Trenton Iron Company, Trenton, N. J.

Rubber Belting, all sizes, 77½ per cent regular list. All kinds of Rubber Goods at low prices. John W. Buckley, 156 South Street, New York.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 East 8th Street, New York.

Wrinkles and Recipes. Compiled from the SCIENTIFIC AMERICAN. A collection of practical suggestions, processes, and directions, for the Mechanic, Engineer, Farmer, and Housekeeper. With a Color Tempering Scale, and numerous wood engravings. Revised by Prof. Thurston and Vander Weyde, and Engineers Buel and Rose. 12mo, cloth, \$2.00. For sale by Munn & Co., 361 Broadway, New York.

Chucks—over 100 different kinds and sizes in stock. Specials made to order. Cushman Chuck Co., Hartford, Ct.

Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Curtis Pressure Regulator and Steam Trap. See p. 142.

Send for free Catalogue of Books of Amusements, Speakers, Dialogues, Card Games, Fortune Tellers, Dream Books, Debates, Letter Writers, Etiquette, etc. Dick & Fitzgerald, 18 Ann St., New York.

60,000 Emerson's 1886 Book of superior saws, with Supplement, sent free to all Sawyers and Lumbermen. Address Emerson, Smith & Co., Limited, Beaver Falls, Pa., U. S. A.

Hoisting Engines, Friction Clutch Pulleys, Cut-off Couplings. D. Frisbie & Co., 112 Liberty St., New York.

"How to Keep Boilers Clean." Send your address for free 88 page book. Jas. C. Hotchkiss, 93 John St., N. Y.

Pays well on Small Investment.—Stereopticons, Magic Lanterns, and Views illustrating every subject for public exhibitions. Lanterns for colleges, Sunday schools, and home amusements. 136 page illustrated catalogue free. McAllister, Manufacturing Optician, 49 Nassau St., N. Y.

Astronomical Telescopes, from 6" to largest size. Observatory Domes, all sizes. Warner & Swasey, Cleveland, O.

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

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.

References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price. Minerals sent for examination should be distinctly marked or labeled.

(1) C. D. asks: What metal or compound of metals can I use to make small castings as hard (or nearly as hard) as brass. Said metal must melt in a common coal fire. A. Use type metal, which you can procure at a stereotype or type foundry, or can obtain by melting old type.

(2) W. E. S. asks: Is there any kind of a liquid that can be obtained at a drug store that will not evaporate, and which has no sediment, or very little, and will not freeze above 5 or 10 degrees below zero? A. We recommend you to try glycerine, or it is possible that kerosene or coal oil might answer the purpose. The temperature you give is so extremely low that all ordinary liquids will congeal at it. A mixture of glycerine and water might answer your purpose.

(3) W. B. asks how to make sodium amalgam. When heated, the explosions are so violent that some is lost. Also how to make zinc amalgam; cold it will not amalgamate, and hot it explodes. A. The formation of an amalgam of sodium is apt to be accompanied by much violence, unless the mercury is in large excess. Make a strong amalgam in small quantities by heating in a covered vessel, and mix with more mercury. Zinc and mercury will amalgamate without the least difficulty if a little dilute sulphuric acid is added. It needs little or no heat.

(4) J. W. K. asks what size an electro-magnet would need to be to lift or attract a weight of 10 pounds through a space of ¼ inch, and how many Leclanche cells? A. There is no rule for calculating the precise size for given strength of an electro-magnet. Leclanche cells are not good, except for intermittent work. Your magnet should be ten or twelve inches long, with ¼ inch cores, and 5 to 10 Leclanche cells would work it. 2. What effect will mercury have on lead if the lead be immersed in it, or vice versa? A. The lead and mercury will amalgamate, and the mercury will be injured for ordinary uses.

(5) Waco asks: 1. Can you tell me of any combination of minerals or chemicals that on coming in contact with extreme cold would produce heat? Can such a thing be done? A. Theoretically, if the proper junction of a thermo-electric battery were cooled, an electric current will be generated, which current can be made to produce heat. 2. Would an engine using oil for fuel, and requiring only 30 lb. steam to give it the power of the ordinary locomotive "at its best," be of any market value? A. We cannot pronounce upon the value of such an engine without further and fuller details. It is all a question of economy of fuel.

(6) W. F. H. asks: 1. In an electro dynamo machine of the Gramme and Weston and other types, the commutator consists of as many segments as there are wires leading from the armature. Will a commutator consisting of 2 or 4 segments answer just as well, provided opposite ends of the armature wires are connected to opposite segments of commutator or will there be a diminution in strength of the current? A. Any reduction of commutator leaves will impair the working of the machine, or may even stop it. The wire in the armature must form a full and complete circuit. 2. Have you working plans for a larger machine than the Siemens in SUPPLEMENT No. 161? A. We have not, but expect soon to publish a description of a larger machine.

(7) F. M. C. asks: How many pounds of wire is required to make a spark coil to light one gas light? Also how many and what kind of batteries it would be best to use? A. Two or three pounds of No. 16 wire with two Leclanche cells should suffice.

(8) E. M. L. asks for directions for manufacturing a liquid shoe dressing. A. Take of shellac one-half pound, alcohol three quarts. Dissolve, and add of camphor one and a half ounces, lampblack two ounces.

(9) T. P. E. writes: If in fitting a crank and shaft or any other work, you get a loose fit, where you should have it to drive, and you heat the shaft to a low red, and allow it to cool, repeating the operation until the shaft is permanently large enough to make a driving fit, will the quality of the iron be injured thereby? A. The heating and cooling of the end of a shaft many times for the purpose of enlargement to receive a driven-on crank causes considerable change in its molecular structure, and is not considered safe where severe work is required from the crank. For ordinary use or for small shafts, there is no objection, except that it is bad practice.

(10) W. M. R.—For computing the safe working pressure for cylindrical shells of boilers: Divide the assumed tensile strength of the iron or steel of the boiler plate by 4 for safety, and this quotient again by one-half the diameter of the boiler shell or cylinder in inches. Then multiply the last quotient by the thickness of the plate in decimals of an inch, and again this product by 0.60 for single rivet seams, or 0.72 for double rivet seams. For example, assuming 50,000 pounds as the ultimate tensile strength of your iron, and a 50 inch boiler, the figures will be for ¾ inch iron, single riveted seams:

450,000	
25	12,500
500	
25	
125.00	
.60	
75.00	

or a safe working strength of 75 pounds per square inch. The heads should be 50 per cent thicker than the shell, and well braced. For internal square firebox boilers for flat stayed surfaces: Divide tensile strength of iron by 4. Multiply quotient by the least area of stay in decimals of an inch. Divide last product, the number of square inches between 4 contiguous stays. Multiply last quotient by the thickness of the plate in decimals of an inch, for the safe working pressure. For example: The leg sheets of a locomotive type, with stays 5 inches center to center, ¾ in. stays, ¾ in. plates:

Area of stay.....	.6
Area between stays 25 sq. ft.)	7500.0
Thickness of plate.....	.30
Lb. persq. in. safe working press.	93.00

The crown sheet stays are more complex, as also the head sheet stays, in this class of boiler. They would require the inspection of a practical engineer in boiler work to make a safer computation. We refer you for further rules and illustrations for strength of boiler work, to Courtney's "Boiler Maker's Ready Reckoner," which we can furnish for \$3.60.

(11) L. S. B. asks a receipt for making a good fire brick for ordinary stoves, one that can be mixed the same as mortar and put in place to set. A. A good lining for stoves may be made by pulverizing the old brick, or any fire brick, and mixing with a little fresh clay, just enough to make it plastic, with which line the fire plates. Dry out the water before making coal fire. The coal fire will bake and make a solid fire brick lining of your plastic brick.

(12) G. F. writes: I have an iron tank in which I wish to keep water for drinking and cooking purposes. What can I do to keep its inner surface from rusting that will not affect the taste of the water? A. Paint the inside of the tank with Prince's metallic paint and boiled linseed oil 2 coats. Allow first coat to dry thoroughly before putting the second on.

(13) W. E. S. asks how to regild gas fixtures that have been soiled by fly specks. A. The cleaning of the lacquer from gas fixtures and redipping and lacquering is an art that requires much care and experience, too much for the occasional work of a plumber. If you wish to make a trial, we can recommend Spon's "Workshop Receipts," which describes the process of cleaning, dipping and lacquering gas fixtures, price \$2.00. There is a cheap way of varnishing and bronzing with bronze dust as practiced by the painters, the material for which you may obtain through the paint trade. It is possible that washing with warm soap and water will improve them.

(14) Morrisiana says: Will you kindly inform me how I can make the cellar of my house dry? The floor is concreted and there are windows back and front. Still it is damp, and everything in it gets mouldy. A. The most thorough way to secure a dry cellar is to plaster the exterior of the cellar walls with the best Portland cement. But this in your case, the wall being already built, would be inconvenient. The next best plan is carefully to point up the joints of the wall upon the inside, with Portland cement made of one part cement and two parts sand. Scratch out the old mortar between the joints and substitute cement. Then you may plaster the walls a quarter of an inch thick with same. Use thorough ventilation. Success will depend upon the care and thoroughness with which the job is done.

(15) G. A. asks a receipt for preparing milk to keep a long time. A. Add bicarbonate of soda in the proportion of about six grains to a quart of milk, and then place in sealed bottles.

(16) D. R. D. asks a recipe for making prepared kindling wood, such as is sold in the grocery stores all through the large cities. A. Dip the wood in melted resin. The following composition is sometimes used: 60 parts melted resin and 40 parts tar, in which the wood is dipped for a moment. Or, take a quart of tar and three pounds of resin, melt them, then cool, mix as much sawdust with a little charcoal added as can be worked in. Spread out on a board, and when cold break up into lumps the size of a hickory nut, and you will have enough kindling to last a good while.

(17) J. H. asks how to remove the paper pasted on the inside of the cover of an old book. There is a book plate under it and the cover is calf over board. Inside paper is old ribbed linen strongly pasted on. A. The only way in which the paper can be removed is by covering it with a damp cloth, until it is sufficiently moist, when it can be easily taken off.

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