

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 publishers of this paper guarantee to advertisers a circulation of not less than 50,000 copies every weekly issue.

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Steam Traps; best and cheapest in use. No blowing through to start. T. Sault, New Haven, Conn.

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The Friction Clutch that is doing work in many places satisfactorily, that has never been done by any other, can be seen at Institute Fair, New York. D. Frisbie & Co., New Haven, Conn.

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

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The Baker Blower runs the largest sand blast in the world. Wilbraham Bros., 2315 Frankford Ave., Phila., Pa.

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Wright's Patent Steam Engine, with automatic cut-off. The best engine made. For prices, address William Wright, Manufacturer, Newburgh, N. Y.

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

H. Prentiss & Co., 14 Dey St., New York, Manufs. Taps, Dies, Screw Plates, Reamers, etc. Send for list.

Presses, Dies, and Tools for working Sheet Metal, etc. Fruit & other can tools. Bliss & Williams, N.Y.

Hydraulic Presses and Jacks, new and second hand. Lathes and Machinery for Polishing and Buffing Metals. E. Lyon & Co., 470 Grand St., N. Y.

Steam Excavators. J. Souther & Co., 12 P. O. Sq. Boston.

Bradley's cushioned helve hammers. See illus. ad. p. 270.

Shafting, Pulleys, Hangers. P. Prybil, cor. W. 40th St. and 10th Ave., N. Y.

Sheet Metal Presses, Ferracite Co., Bridgeton, N. J.

Band Saws a specialty. F. H. Clement, Rochester, N. Y.

Microscopes. G. S. Woolman, 116 Fulton St., N. Y.

Eclipse Portable Engine. See illustrated adv., p. 253.

Brass or Iron Gears; list free. G. B. Grant, Boston, Eagle Anvils, 9 cents per pound. Fully warranted.

Patent Steam Cranes. See illus. adv., page 222.

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

Noise-quieting Nozzles for Locomotives and Steamboats. 50 different varieties, adapted to every class of engine. T. Shaw, 915 Ridge Avenue, Philadelphia, Pa.

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

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, N. Y.

For best low price Planer and Matcher, and latest improved Sash, Door, and Blind Machinery. Send for descriptive catalogue to Rowley & Hermance, Williamsport, Pa.

Catechism of the Locomotive, 625 pages, 250 engravings. The most accurate, complete, and easily understood book on the Locomotive. Price \$2.50. Send for a catalogue of railroad books. The Railroad Gazette, 73 Broadway, New York.

The New Economizer, the only Agricultural Engine with return flue boiler in use. See adv. of Porter Mfg. Co., page 270.

Wanted—A competent young man to write specifications of patents in an attorney's office, and instruct in-

ventors in matters relating to patent law. A young lawyer preferred. The very best references required. Address, stating terms, previous employment, etc., "Examiner," Post Office Box 2979, New York.

Special Wood-Working Machinery of every variety. Levi Houston, Montgomery, Pa. See ad. page 269.

For best Portable Forges and Blacksmiths' Hand Blowers, address Buffalo Forge Company, Buffalo, N. Y. Millstone Dressing Diamonds. Simple, effective, and durable. J. Dickinson, 64 Nassau St., New York.

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

Sawyer's Own Book, Illustrated. Over 100 pages of valuable information. How to straighten saws, etc. Sent free by mail to any part of the world. Send your full address to Emerson, Smith & Co., Beaver Falls, Pa.

Tight and Slack Barrel machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus' adv. p. 30.

The Horton Lathe Chucks; prices reduced 30 per cent. Address The E. Horton & Son Co., Windsor Locks, Conn.

\$300 Vertical Engine, 25 H. P. See illus. adv., p. 221.

Telephones repaired, parts of small capital. Send stamp for circulars. P. O. Box 205, Jersey City, N. J.

No gum! No grit! No acid! Anti-Corrosive Cylinder Oil is the best in the world, and the first and only oil that perfectly lubricates a railroad locomotive cylinder, doing it with half the quantity required of best lard or tallow, giving increased power and less wear to machinery, with entire freedom from gum, stain, or corrosion of any sort, and it is equally superior for all steam cylinders or heavy work where body or cooling qualities are indispensable. A fair trial insures its continued use. Address E. H. Kellogg, sole manufacturer, 17 Cedar St., New York.

Magic Lanterns and Stereopticons of all prices. Views illustrating every subject for public exhibitions. Profitable business for a man with small capital. Send stamp for 50 page illustrated catalogue. McAllister, Manufacturing Optician, 49 Nassau St., New York.

Vertical and Horizontal Engines M'fd by Naegig & Bro., Allentown, Pa.

Milling, Profiling, Cam Cutting, Revolving Head Screw Machines. Pratt & Whitney Co., Hartford, Conn.

Deoxidized Bronze. Patent for machine and engine journals. Philadelphia Smelting Co., Phila., Pa.

Wheels and Pinions, heavy and light, remarkably strong and durable. Especially suited for sugar mills and similar work. Circulars on application. Pittsburg Steel Casting Company, Pittsburg, Pa.

The only economical and practical Gas Engine in the market is the new "Otto" Silent, built by Schleicher, Schumm & Co., Philadelphia, Pa. Send for circular.

Steam Engines, Automatic and Slide Valve; also Boilers. Woodbury, Booth & Pryor, Rochester, N. Y. See illustrated advertisement, page 285.

NEW BOOKS AND PUBLICATIONS.

DIZIONARIO TECNICO E NAUTICO DI MARINA. ITALIANO, TEDESCO, FRANCESE ED INGLESE. P. E. Dabovich, I. R. Technico Navale. Pola, 1879. Verlag der Reaktionen der "Mittheilungen aus dem Gebiete des Seewesens." (Italian, German, French, and English Dictionary of Nautical Terms.)

This work consists of an Italian, German, French, and English dictionary, in which the terms of each language are alphabetically arranged, and have the translation into the other three languages adjoining them. The work is very carefully prepared, and will be not only of great interest, but of great use and importance to mariners.

LA LOCOMOTIVE MARINE. Par A. Huet, La Haye: 1879. J. & H. Van Langenhuyesen. 4th Edition.

This work consists of a series of extracts from the English, French, Hollandish, and German scientific publications, relating to rapid maritime propulsion, and especially to the water locomotive invented by the author. (See SCIENTIFIC AMERICAN, Vol. 28, page 258.)



HINTS TO CORRESPONDENTS.

No attention will be paid to communications unless 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 SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

(1) S. F. P. writes: 1. I have half a dozen gravity cells, and wish to prevent evaporation of the solution; what kind of oil poured on the surface is best for the purpose? A. Lard oil will answer. 2. Will anything prevent the incrustation of sulphate of zinc which forms from the surface up over the edge and down the outside of the jar? A. Clean and dry the edge of the jar and rub the inside with tallow for about an inch from the top.

(2) H. B. H. asks: What size and what weight should a bell be to be heard at 3 miles distance, or say in radius, counting on the wind? The height at which the bell will be situated will be about 45 feet from the ground. The city has a radius of 3 miles from the

tower where the bell will be located. Also taking in consideration that the mean temperature is from 84° to 92° Fah. A. It is impossible for us to give any information on this subject that would be reliable. In fully half of the cases it depends upon the formation of the land surrounding the building in which the bell is to be placed. In a hilly locality, a bell will not be heard as far as if the land were level, or nearly so. A bell will be heard a great deal further lengthways of a valley, than over the hills at the sides. It is frequently the case that bell rooms are lower than the surrounding buildings and trees, and these obstructions break the sound, and prevent its free passage to a distance. It is frequently the case too, that towers have small windows, or openings, with the louver boards so close together as to almost box up the sound. In cities, the noise of steam and horse cars, manufacturing establishments, carriages and carts rattling over the pavements, etc., is so great, that bells are not expected to be heard at any considerable distance, and this is the reason why, in all cities, several bells are used for fire alarm purposes, it being impossible for one bell, no matter how large it may be, to be heard above the thousand and one noises incident to every large place. The largest bell ever made in this country weighed 22,000 lb., and, before it was fractured, hung on the City Hall in New York. On one or two occasions this bell was heard up the Hudson river thirteen miles, in the night, when the city was comparatively quiet. Water is a good conductor of sound, and aided materially in making the bell heard as above mentioned. It is a great mistake to suppose that bells can be heard in proportion to their weight; that is, that a bell of 2,000 lb. will be heard twice as far as one of 1,000 lb. This is not so, for the reason that the larger bell does not possess anything like twice the resonant surface of the smaller one. What is gained and admired in the larger bell is its deep, majestic, dignified tone, which it is impossible to secure in the smaller one, the weight of a bell invariably governing its tone. A bell of 100 or 200 lb., in an open belfry, on a school house or factory in the country, is frequently heard at a long distance, out of all proportion, apparently, to one of 1,000 lb. in a church tower near by; and instances of this kind frequently cause no little comment in the way of comparison. The reason for this is, that the small bell has a sharp, shrill, penetrating sound, that must, of necessity, be heard a great deal farther in proportion to its weight, than the low, mellow, "church going" sound of the church bell. The same principle applies to the whistle of a locomotive, and it is heard a long distance simply because its tone is shrill and penetrating. When hung stationary and struck, or tolled, bells will not be heard, as a rule, half as far as when swung. The swinging motion throws the mouth of the bell up, and not only carries the sound off, but imparts to it a richness that is always absent when the bell is at rest and struck. A great deal is to be gained by ringing a bell properly, throwing the mouth well up, and not lazily jingling it. It is not physical strength that is required in ringing a bell so much as "getting the knack" of catching the rope just right, particularly on the second "down pull." The windows in the tower should be as open as possible, and the tower should be ceiled just above the windows. The above information is kindly furnished us by Messrs. Meneely & Co., bell founders, of West Troy, N. Y.

(3) C. T. writes: 1. I have a water power 200 feet distant from house. Is it practicable to light a room 12x20 in house by means of an electric machine placed at water power? A. Yes. 2. About what is cost of machine and onelamp? A. Consult dealers who advertise in our columns. 3. What would be cost of batteries sufficient to run lamp? A. It would require about 50 cells, and the first cost of the batteries would be about \$100. 4. What is expense of running light by each method? A. It will depend altogether upon circumstances, but in any case the electric machine will produce the current more economically than batteries.

(4) N. S. writes: I desire to go into the manufacture of soft soap. I have tried several recipes for making it, but without satisfactory results. How can I make a good strong soft soap from potash with common grease, such as meat skins and cracklings? Also, how can I clear dirty soap grease? Please give me a recipe that I can try on a small scale, say 25 or 30 gallons at a time. Would borax be of benefit to it in any way? I want a good cleanser, without being injurious to fine fabrics. A. The proportion should be in the ratio of 100 parts grease to about 22 of caustic alkali (potash). The alkali is rendered caustic by mixing it with 2 parts of quicklime and about 5 parts of soft water in an iron vessel, boiling the mixture and letting it settle. The clear lye should contain about 15 per cent of caustic alkali. The clear grease is mixed into an emulsion with a portion of the boiling lye. Boil and stir for an hour; then add the remainder of the lye, boil and stir until the soap, instead of bubbling up, has its surface covered with large blisters or "leaves." The clear boiling is finished when some of the soap cooled on a glass plate becomes firm and separates readily from the glass. To purify the grease cover it with water containing about 1 per cent of sulphuric acid and heat nearly to boiling, adding a few small pieces of niter, if necessary, and stirring the mass. Wash the fats which separate with hot water, and let impurities subside before skimming. Borax is sometimes used with advantage in laundry soap, but not in soft soap. Large quantities of water glass are often introduced, however.

(5) J. E. J. asks: How can I make strips of leather 1/4 x 1/2 inch and 6 inches long hard and stiff, but not brittle, and have them stay straight? A. Try strong aqueous solution of caustic soda. Wash with plenty of water and dry at 80° Fah.

(6) H. J. F. asks what upholsterers use to clean the seating of chairs. I have used brushing and water, yet the black is not sufficiently glossy. A. Use a little spirit of turpentine or benzole.

(7) J. A. R. asks: How can I mix bronze so that it can be applied with a brush, like paint, or should I size my surface like laying gold leaf? A. Size as with gold leaf.

(8) C. W. F. asks for a recipe for the ink to be used with the copying pad described in your paper of the 11th instant. I have been successful with

the pad. I used 1 oz. of white glue and 4 oz. of glycerine. A. Dissolve aniline blue (methyl violet R. B. does very well) in five or six parts of hot water, let it stand, and use the saturated solution when cold.

(9) C. F. H. asks (1) how many cubic feet will an oil barrel of 64 gallons hold at 5 lb. air pressure? How many at 10 lb.?

Gallons (64) x inches in gallon (231) = about 8 1/2 cub. feet at normal pressure; at + 5 lb., 11 1/2 cub. ft., and at +100 lb., about 57 lb. 2. Is there any liquid known that can be conveniently converted into gas except gasoline? A. Several of the lighter distillates of petroleum answer nearly as well. 3. I got up a gas machine. It works well so far, but the light is not big enough, too much air, and blows by turning it up higher. Will cotton batting help it any to vaporize in the tank? A. Yes.

(10) C. M. asks (1) for a recipe for cleaning gilt frames. A. Use a soft sponge and wine spirit. 2. What is used with emery in making solid emery wheels to make it harder? A. Vulcanized caoutchouc, zinc chloride or oxychloride, zinc chloride and barium carbonate, vitrifiable fluorides, alkaline silicates (soluble glass), litharge, and japan, shellac and other resinous and gummy matters, blood, albumen, and lime, etc.

(11) E. B. C. asks: How are autumn leaves prepared so as to preserve their texture and color for use in making ornamental crosses, wreaths, etc., for house decoration? Would like to know the process used by florists to avoid giving a glossy appearance, as is the case where varnish is used. A. See p. 409 (7), Vol. 40, SCIENTIFIC AMERICAN.

(12) McC. writes: Will you give in your paper a detailed account of the process by which the rubber toys, so common in our stores, are made, that is, of what material, or combination, how moulded, etc. A. To what toys do you refer? See pp. 48 and 105, Vol. 39, SCIENTIFIC AMERICAN, also "Hints to Correspondents," above.

(13) S. H. W. asks (1) if the heat passing through pipes from a common stove would be sufficient to raise the water in the boiler of a steam fire engine to a degree acquired by the New York steamers or nearly so. A. No. 2. In the SCIENTIFIC AMERICAN, of October 2, about hydromotors, are there any models to be seen in New York? A. We think not.

(14) F. B. D. writes: I have made a Grenet battery according to your directions to A. C. F., last week. It is all right so far; it gives a bright spark, but when you take the wires in your hands you can feel nothing; ought this to be so? I would like you to explain this. A. A shock cannot be obtained from a single element without using a coil, but with an induction coil like that described on p. 208 (14), Vol. 39, of SCIENTIFIC AMERICAN, powerful effects may be produced.

(15) P. P. asks: Cannot a motor be applied to a small boat large enough to contain about ten persons, aside from steam power? I contemplate building a small pleasure boat (self propelling), but owing to the stringent laws bearing upon vessels propelled by steam, would like, if possible, to dispense with the use of it and apply some other power. A. There is no motor so well adapted to the purpose as steam; calorific engines, air and gas engines, occupy too much room and are too heavy for the power developed.

(16) C. E. C. asks: 1. What is meant by saying a cannon is such a pounder? A. It means that a solid spherical projectile fitting such a cannon will weigh so many pounds. 2. What is the size of bore of the different guns? A. The bore is the diameter of the bore of the gun.

(17) J. T. L. writes: Noticing in "Notes and Queries," on p. 267, current volume (L. G., No. 17), something about a planer heating, I would say to him (having had quite an experience in that line) that a perfectly balanced planer with bearings fitted just right never will heat. We had a 26-inch surfacer that troubled us, although not as badly as L. G.'s. Every little while it had to have the cylinder turned up and boxes rebabbitted. I suggested to our machinist that the cylinder was out of balance. He thought he knew better, but as I insisted on it he finally put it on balancing ways. How quick it told what the matter was! Four 1/2 inch holes, 1 1/4 inch deep, were drilled into it before it was right. It has now been running over a year, and the lining of the boxes has never been taken out, and for five months not a screw has been turned to tighten the boxes, and it does very nice work. Side cutter spindles made a great deal of trouble in this mill before I came here, but a pair of good balancing bars and a good use of them soon cured that. Thousands of dollars are spent for oil where as many cents spent in properly balancing and turning machinery would save it all. Care should be taken that the knives on a planing machine should be kept perfectly balanced; not only shall balance on a pair of scales, but that the ends of the knives balance with each other or be of the same width, so that they may balance when running, for a standing and a running balance are two entirely different things. Both ends of a cylinder may be badly out of balance when running, but be perfectly in balance when standing, and this puzzles more woodworkers than a few. I think a pair of balancing bars are indispensable in every woodworking mill, and are very easily made by taking two old planer knives, and filing or grinding down the edges till you get about 1/2 of an inch in thickness. Straighten up perfectly with file and straight edge, then take blocks of wood and fit closely in the end slats, and put some wood screws in the bottom of your wooden crosspieces, so you can adjust and make them perfectly level; put your cylinder on carefully, and it will soon tell you if it is in balance. Take out all bolts first, and in putting back care should be taken that it balances when the bolts are in, and finally when the knives are on. It should not be let go when it is about right, not till it is just right. Another thing, a cylinder should be turned up perfectly to start with. So many machinists turn up a cylinder, and bear on with a coarse file to take out the tool marks, that by the time they rethrough it is out of truth decidedly. A man should never be allowed to touch a planer cylinder unless