

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 the following week's issue

The new material, "Linenoid," Westfield, Mass. For pumping engines. J. S. Mundy, Newark, N. J. "U. S." metal polish. Indianapolis Samples free. Improved iron planers. W. A. Wilson, Rochester, N. Y. Heading machinery. Trevor Mfg. Co., Lockport, N. Y. Microbe Killer Water Filter, McConnell Filter Co., Buffalo, N. Y. Wanted—Light machinery or specialties to build. P. G. Fleming's Machine Works, Elizabeth, N. J. Pipe frame truck baskets, steel and wooden trucks, etc. L. M. Moore, Rochester, N. Y. See page 399. Steam Hammers, Improved Hydraulic Jacks, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York. Sewing machines, milling machines, and drill presses. The Garvin Mach. Co., Laight and Canal Sts., New York. Centrifugal Pumps. Capacity, 100 to 40,000 gals. per minute. All sizes in stock. Irvin Van Wie, Syracuse, N. Y. Wanted—To buy patent or right to manufacture an article of general use. Wm. L. Elder, Indianapolis, Ind. Carborundum—hardest abrasive known. Send for prices of wheels, powder, etc. The Carborundum Co., Monongahela, Pa. Emerson, Smith & Co. Ltd., Beaver Falls, Pa., will send Sawyer's Hand Book on Circulars and Band Saws free to any address. For Sale—Puttying tool patent. See page 76. Address for terms and particulars, Theodore Witte, Chilliwack, British Columbia. Models and experimental work. Small articles made in quantity for the trade. For catalogue, etc., write L. G. Winn Mfg. Co., Indianapolis. Guild & Garrison, Brooklyn, N. Y., manufacture steam pumps, vacuum pumps, vacuum apparatus, air pumps, acid blowers, filter press pumps, etc. The "Olin" Gas and Gasoline Engines, from 1 to 10 horse power, for all power purposes. The Olin Gas Engine Co., 222 Chicago Street, Buffalo, N. Y. Party having new U. S. and Can. pats. wants business partner in manuf. and for sale of rights. Staple goods. Solid business. G. H. Gere, Grand Rapids, Mich. The best book for electrician and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y. For the original Bogardus Universal Eccentric Mill, Foot and Power Presses, Drills, Shears, etc., address J. S. & G. F. Simpson, 26 to 36 Rodney St., Brooklyn, N. Y. Competent persons who desire agencies for a new popular book of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York. Notice to Inventors of devices in wood wishing assistance in patenting, making, or marketing their inventions. Communicate with the subscriber, who has a large factory, where all kinds of hard and soft woodworking is done. Johnson, care of Scientific American, N. Y. City. Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

of your motor must be placed. This is approximately 40 ohms. The resistance must be capable of passing 7 1/2 amperes. 2. Would it do to solder the smaller wires at points of connection? A. Twist and solder. 3. Is it possible to run an alternating motor by a battery current passed through an induction coil? If so, are such motors manufactured, and by whom? A. Yes. Address the Westinghouse Electric Company, Pittsburg, Pa.

(5741) H. A. J. asks: Will you please answer the following questions? What kind of wire is the core of an induction coil made of, and how many feet of wire will it take for both primary and secondary, also how much of each? I would like to make a shocking battery to give from 50 to 100 volts. A. You will find excellent articles on induction coils in our SUPPLEMENT, Nos. 160, 166, 229, 569; a coil is very seldom made for so low a voltage. Those described by us run up to thousands of volts. A simple spark coil with iron wire core 1/4 x 6 inches, wound with two or three pounds No. 20 wire, with a circuit breaker, would answer your purpose.

(5742) A. H. B. says: Suppose a reservoir elevated 50 feet has two discharge pipes each 3 inches in diameter, perpendicularly from the bottom. One pipe 1 foot long, the other 40 feet long, both discharge into the open air. Will one pipe empty it quicker than the other, and if so which one? Also what would be the result if the pipes were 1/2 inch in diameter, same length? A. The long pipe will empty the reservoir the quickest in both cases. The short tube has only the hydrostatic pressure of the head of water in the tank, while the long tube has the suction due to a vacuum in addition to the hydrostatic head of the reservoir, less the retardation due to friction of the water in the pipe, which is small.

(5743) J. D. asks: 1. Can caustic soda be substituted instead of caustic potash in the caustic potash batteries described in "Experimental Science"? A. Yes. 2. If so, what would be the current and E.M.F. of a pintcell using this solution? A. About the same as for caustic potash, from 1/2 to 1 volt, and low internal resistance.

(5744) W. S. L. asks: What zinc surface is necessary in a bichromate battery to produce one amp re of current? That is, what surface must be exposed to the fluid? A. This depends on the external resistance. With low resistance, a zinc plate of two or three square inches immersed area would answer. Large carbon plates operate to prevent polarization and so tend also to maintenance of a high potential, with consequent current.

(5745) W. J. S. asks if there is anything through which a horseshoe magnet will not draw; for instance, if you put a needle on one side of a glass and the magnet on the other, the needle will follow the magnet. A. A plate of iron will, by absorbing most of the lines of force, cut off the attraction of a magnet for iron on the other side of it.

(5746) J. T. asks how carbons are plated with copper, as I wish to make carbon brushes for exciter for dynamo. I find that carbon works better than copper, not wearing the commutator so much. A. Electroplate by regular process, in a copper sulphate (blue vitriol) bath.

(5747) M. N. J. writes: 1. Suppose an oscillating body making 40 oscillations per minute, requiring 2 pounds pressure at each oscillation. If the motive power be supplied by compressed air, pumped by an ordinary strong person, what percentage of time would it require to keep the body moving?—the compressed air to be pumped into a tank and power applied by some form of valve and piston action. A. You must give the distance the force must be applied through, whether the body is to be pushed for an inch or a foot, or for what extent of motion. Mere pressure requires no energy. 2. Has the idea any great disadvantages to overcome? A. None that we can see. The clock pendulum and escapement are an example.

(5748) R. H. asks: 1. How is the unicycle described on page 20, January 13, 1894, steered? A. Unicycles are steered by balance. Shifting the center of gravity to one side turns them in that direction. 2. Also please state of what and how hard rubber is made. See our SUPPLEMENT, Nos. 249, 251, and 252, for an excellent treatise on the manufacture of all kinds of India rubber.

(5749) G. W. D. asks: Would it be practical to run a cream separator with a motor and furnish the electricity by a gravity battery and a storage battery? If so, what would be the cost, and could a person not an expert put it in? Where can I get them, and could I make the gravity battery? A. It would be practical, except that a great many gravity battery cells would be required. To charge a single cell at the full rate 50 gravity cells per square foot of positive plate would be needed. You could make the gravity battery. A cert in amount of expert knowledge is needed, especially in running the storage battery.

(5750) H. C. R. asks for the best substance, wood or compound, that would give the greatest amount of expansion when immersed in water at boiling temperature. Object, to secure a limited pressure from said expansion. A. A zinc rod gives the greatest amount of expansion among the metals. A hard rubber rod of same length will have a greater amount of expansion.

(5751) M. C. C. writes: 1. Will the inclosed sample of wire give good results if used in making core of armature for motor described in SUPPLEMENT, No. 641? A. Yes. It would be well to oxidize and shellac it first. 2. How many pounds of No. 16 wire does the field require? A. 3 1/2 pounds. 3. How many pounds of No. 18 wire does the armature require? A. 2 1/2 pounds. 4. Is it single or double covered (cotton) magnet wire? A. Double covered is preferable. 5. How many convolutions are there in each layer of field magnet? A. 34 feet. 6. What is the resistance of motor as a series machine? A. 2 ohms if wound with No. 16 wire on armature, 2-6 ohms if with No. 18. 7. Could I change it to a shunt machine by simply changing the size of wire in field and not in armature, and if so, how much? A. The motor is described as shunt wound. The winding has to be adapted to the potential maintained or to the combination of external resistance and potential, according to circumstances.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 23, 1894,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Table listing inventions with patent numbers and names. Includes items like Adding machine, Annunciator system, Bag, J. W. Hill, Band cutter, etc.

Table listing inventions with patent numbers and names. Includes items like Fence post, Bronson & Helland, Fence post, C. M. Klier, Fence post support, C. F. Reist, etc.

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. Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same. 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.

(5739) O. V. S. asks: 1. I want to make a motor from the hand power dynamo described in SUPPLEMENT, No. 161, for running sewing machine. I am making drum armature with 12 coils. What size wire must I use on field and armature to run from storage batteries, each cell having 8 plates 4 1/2 x 8? A. Wind the field to a resistance of 5 1/2 ohms, with No. 21 wire. Wind the armature to a resistance of 6 ohms. Use wire of size to give this resistance. 2. What is the amperage of such a cell? A. One and one-half amperes. 3. When cell is formed, how many gravities will it take to charge it? A. Two and one-half in series for each cell, and enough in parallel to give nearly 1 1/2 amperes of current. 4. How long will it take to charge? A. Ten hours if you have current enough. 5. Can I run a 1 gallon plating bath with 1 cell, nickel plating? A. Yes. 6. How many storage cells will it take to light a 2 candle power lamp two hours each night, batteries being charged during daytime with gravity cells? A. Three cells. 7. In making plates for storage battery should they be punched full of holes and filled with red lead? A. You may do so. See our SUPPLEMENT, Nos. 845, 838, 159, also SCIENTIFIC AMERICAN, No. 2, vol. 61, No. 20, vol. 69, No. 9, vol. 68, for storage batteries. 8. How long will the plates last when in constant use? A. With care, for several years. If not rightly treated, they may deteriorate in a few days.