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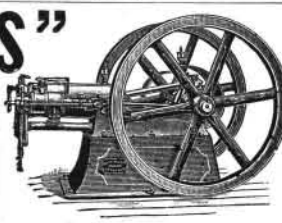
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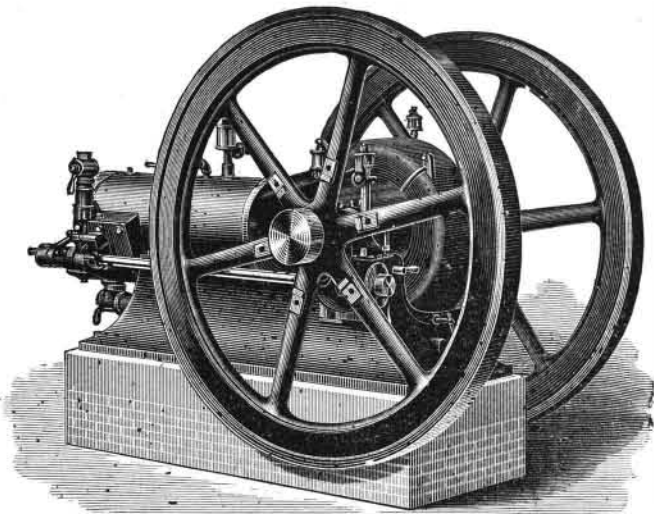
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### HINTS TO CORRESPONDENTS.

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 This is for our information and not for publication.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.

(8534) H. D. F. writes: I have a coil which will give a six-inch spark, and have masts erected on the roofs of the buildings, about 1,000 feet apart. Using the coils with the arrangement described by Mr. A. F. Collins in the SCIENTIFIC AMERICAN of September 14, 1901, will I be able to obtain good results? A. Yes.

(8535) S. B. S. asks: 1. Will a 4-ohm telegraph work on a line one mile in length? A. Yes, if all else is in good shape. 2. If so, how many gravity batteries will be required to work the instruments if No. 12 galvanized iron wire is used with ground circuit? A. The number depends upon the joints and insulation. We should put 4 to 6 cells and try it. Then add others if necessary. 3. How many gravity batteries will be required to work two 4-ohm telegraphs on a line 265 feet in length, where No. 18 uninsulated wire is used with ground circuit? A. Probably two will do the work.

(8536) D. H. asks: 1. Is there any way that a number of open-circuit sal-ammoniac cells (say twelve) can be connected together so as to produce a continuous current for an incandescent light? Is there any apparatus made for such cells to make them produce a more continuous current? A. No. It is impossible to use a sal-ammoniac cell on a closed circuit for any length of time. 2. Will dry cells recuperate as quickly and as well as wet open-circuit cells? A. No.

(8537) M. B. T. asks if putting the antennae of a wireless telegraph system in an iron or other pipe will prevent the emission of the Hertzian waves? A. Anything which disturbs the free outflow of the waves from the vertical wires will disturb the transmission.

(8538) E. H. S. asks: 1. I should like to know something about the mathematics of an induction coil: how to calculate its probable output and what vital points tend to increase or diminish its efficiency. A. You will find in our SUPPLEMENT No. 1124, price ten cents, the description of a coil which gives a 6-inch spark. This will do X-ray work upon the thinner portions of the human body. For the thickest parts, a coil is employed which will give a spark of 14 inches or more. Such a coil is described in Hare's "Large Induction Coils," price \$2.50 by mail. 2. Something about the Wehnelt electrolytic interrupter. A. We can send you five numbers of the SUPPLEMENT containing illustrated articles upon the Wehnelt interrupter, at ten cents each. SUPPLEMENT, pages 19602, 19811, 20871, 20982, 21500. 3. How to build an induction coil suitable for X-ray work, etc.? A. Faraday's laws of the induced current govern the action of a coil. The correct designing of a coil is the result of experience extending over many years, as well as the application of law to the case.

(8539) W. E. A. writes: 1. I would like to know if there is any advantage in using plate rather than ordinary glass regardless of difference in price? The plate will run opposite-ly 1-16 inch apart (20 inch D.), while some window-glass may run seldom less than 3-4 inch apart. A. It is an advantage to bring the plates of any static machine as near to each other as possible. If they will not run nearer than 1/8 inch apart, the machine will not be very efficient. 2. The plate is usually about 3-16 inch thick. Does this thickness of glass take away from the efficiency of the machine? A. It is not advisable to use glass of a greater thickness than will stand the strain of the running. 3. Could you also tell me as to how I can obtain drawings or descriptions of the arrangement of conductors or carriers for a two-plate Wimshurst? A. A good design of a Wimshurst machine can be found in the Bottone's "Electrical Instrument Making," price 50 cents, by mail.

(8540) J. F. McG. asks: 1. What is the temperature of a 30-candle power incandescent electric light? A. The temperature of incandescence is not directly connected with the candle power of a lamp. Ganot gives the temperature as 2,350 deg. Foster's Pocketbook gives it at about 2,500 deg. 2. What is rare earth and where can it be obtained? A. Certain minerals have been known

(Continued on page 160)

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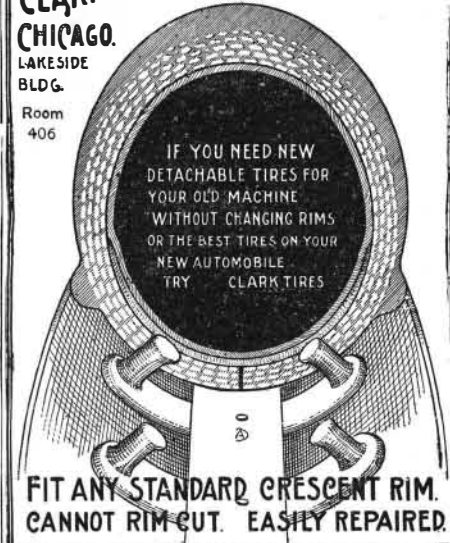
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among chemists as earths. The rarer ones are zirconia, glucinia, yttria and thoria. They are oxides of elements of similar names. 3. What candle power would a 220-volt lamp give? A. It may be of any candle power, depending upon the resistance of its filament.

(8541) R. B. asks: 1. Will a watch become magnetized by a motor? A. Yes; if there is much external magnetism in the space around the motor. 2. How can you tell if it is? A. By its irregular motion, or failure to keep time as well as it has been doing, often even stopping entirely. 3. How can it be demagnetized thoroughly? A. The quickest way is to take it to a jeweler, who is nowadays quite accustomed to this disease of watches. We can send you two valuable articles on the subject for 20 cents.

(8542) D. S. asks: Will you please answer through the columns of your valuable paper, if a small motor or dynamo, say 1-16 to 1/2 horse power, can be designed the same as larger machine of 1 horse power or over, that is in regard to the magnetic flux in the different parts? A. All dynamos are designed by the same rules.

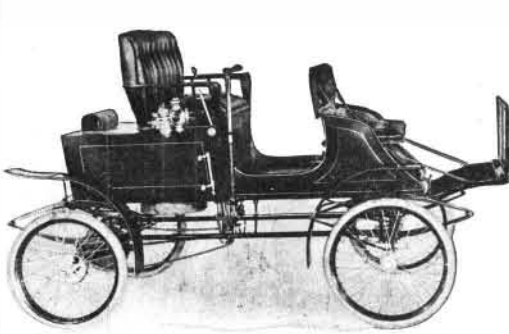
(8543) F. M. C. asks: 1. In winding the primary and secondary coils for a medical battery (faradic current) should both be wound right or left hand, looking from the same end of the coil, or should one be wound right hand and the other left hand? A. We do not see how it can make any difference in which direction the turns of a coil are wound. The electrical induction will find that out for itself. 2. In using a galvanic battery, for medical purposes, of say ten carbon and ten zinc plates arranged zinc to carbon through the entire number, is it absolutely necessary to have each element, that is a carbon and zinc plate, in a separate cup or cell with the fluid, or will the battery work as well, and the current last as long, if one large cup is used containing all the elements and fluid? A. If all the plates are in one cell, you will have one cell with the electromotive force of one cell, but with the amperes due to the large surface of your single plate. The same state of the current results if you connect all the positive plates together, and all the negative plates together from a larger number of smaller sized cells. This is connecting in multiple. If, on the other hand, you join the zinc of one cell to the carbon of the next in series, you will have an electromotive force equal to that of one cell multiplied by the whole number of cells, and a less number of amperes because of the greater resistance of the arrangement. This is a battery connected for intensity.

(8544) W. H. G. asks: 1. Please give acid used in pole indicator and ground detector and state what size and kind of wire is used. A. Make a solution of alcohol, 10 cu. cm., phenolphthalein, 1 gramme. Add to this distilled water, 110 cu. cm. Make a second solution of sodium sulphate, 20 grammes, in 100 cu. cm. of water. Soak blotting paper in the first solution, and drain off the superfluous liquid. Then soak the paper in the second solution and dry the paper. To test the poles of an open circuit, moisten a strip of the paper, and place the ends of the wires about two inches apart upon it. A red spot will appear around the end of the negative wire. 2. Is there any way in which a bipolar dynamo can be made to give a steady current and not an alternating current? I cannot run a Ruhmkorff coil because of this, and would like to know if there is any instrument or battery that I can connect in circuit to stop this alternation? A. A dynamo gives a direct or continuous current when its armature is provided with a commutator. The same machine gives an alternating current when its armature is fitted with rings connected to the windings. Either form of dynamo will work a Ruhmkorff coil equally well. If the alternating current is to be used, screw down the break circuit so that it will not vibrate. 3. Do I understand that in the system of wireless telegraphy explained in SCIENTIFIC AMERICAN of January 4, 1902, there is no Ruhmkorff coil used in the transmitting part, but just the batteries connected to the earth? A. We have no facts additional to those in the article referred to. 4. What are inductance coils, and please give idea of how made? What is a choke coil, and how made? A. An inductance or a choking coil is a coil to reduce the current by its induction upon the current as it passes through it. A second current is set up in the inductance coil, which flows in the opposite direction to the main current and thus chokes it off, so to speak. 5. Please give number of SUPPLEMENT, if you have same, that has plans and working drawings for constructing small gasoline motor. A. See SUPPLEMENTS Nos. 715 and 716, for construction of gas engines, 23 figures, 10 cents by mail. Also a book on "Gas Engine Construction" by Parsell and Weed, \$2.50 by mail.

(8545) J. W. J. asks: What depth of water does it take to float the largest ocean steamers loaded, and also which are the three largest steamship companies? A. The largest ocean steamer is the "Oceanic." If she were loaded to her maximum capacity, she would draw 36 1/2 feet of water. The Hamburg-American, the North German Lloyd and the White Star are the largest steamship companies.

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