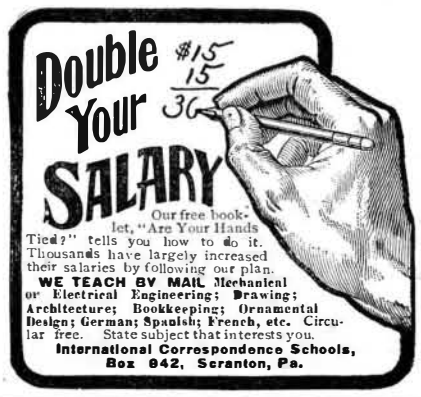

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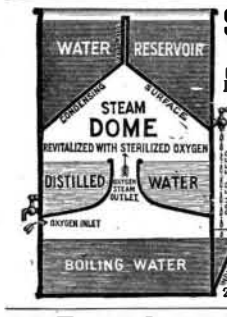

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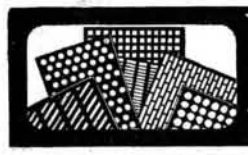
(8496) W. L. J., Jr., writes: I was much interested in your article in the SCIENTIFIC AMERICAN of November 16 in regard to the "wind pressure gage," and how the pressure of the wind on a square foot of surface indicates the velocity per hour. Will you kindly give me the rule for finding this? You say 1⅛ pounds = 15 miles, 4½ pounds = 30 miles, and so on. On this basis I make 3⅛ = 25 miles, 12½ = 50 miles, but how can one figure on a pressure of say ½ pound or find the pressure of a 10-mile breeze? A. The formula for velocity of the wind from the observed pressure is $\sqrt{200 \times \text{pressure in pounds per square foot}}$ = velocity in miles per hour; and for the pressure derived from the observed velocity the formula is V^2 in miles per hour $\times$ 0.005 = the pressure in pounds per square foot.

(8497) W. F. G. asks: Will vulcanized fiber answer for the insulation on static machines, and are vulcanite and vulcanized fibers identical? A. Vulcanized fiber will be but little better than wood as an insulator in this position. Vulcanite is hard rubber and is a different substance from fiber.

(8498) E. L. asks: 1. Can you tell me, without knowing the amperage, the voltage being 50 volts, if a 75-watt dynamo or 1-6 horse power as motor will light 5 lamps of 10 candle power at full capacity? A. Ten-candle lamps may be taken to be from 3 watts to 4 watts per candle. One lamp will consume from 30 watts to 40 watts, and 75 watts will light two such lamps. 2. What is the resistance of No. 16 iron wire? A. Pure iron has a resistance 6 times as great as copper. Ordinary telegraph wire has a resistance 15 times as great as that of copper of the same size. No. 16 copper wire has 248.81 feet per ohm. Pure iron wire of the same size would have 41.47 feet per ohm, and No. 16 ordinary iron wire would have 16.19 feet per ohm. 3. If a current of 10 amperes at 108 volts goes through 540 feet of No. 16 iron wire, what will be the electromotive force and current remaining after it has gone through, and how to calculate it? A. There will be 10 amperes remaining. But there will not be any volts remaining, if the wire constitutes the entire circuit between the mains. The same amperes flow through the entire circuit and come out at the other end, just as the water flows through the entire length out of a pipe open at both ends and comes out at the other end. The drop of potential along a wire is proportional to its length, provided it is of uniform sectional area, as it may be presumed to be in this case. This being so, there will be a drop of one volt for each four feet along the wire. 4. Can we run a direct-current motor with an alternating current? The motor is not loaded. A. Yes; if it be started and brought up to synchronism with the current by hand, or by some other power. It will then keep step and run by alternating current.

(8499) C. W. N. asks: 1. Approximately how large a spark coil is needed in wireless telegraphy to transmit through a distance of one mile, and how large for a distance of five miles? A. A coil giving a spark one inch long will transmit one mile over water. Over land the spark length varies with the character of the surface. A coil giving a ten-inch spark will answer for a variety of distances, and circumstances. 2. In winding a large spark coil in which the greatest amount of wire is placed on the middle part of the coil, I have learned that it is customary to leave a space between the core and the wire at the ends. Is there any disadvantage in winding so that the wire lies directly on the main insulating tube? A. The space is left because of the greater tendency of the spark to jump from the secondary into the primary as the ends of the coil are approached. See Hare's "Construction of Large Induction Coils," price $2.50 by mail. 3. Is there any better insulator than paraffine for use in the construction of coils? A. Paraffine or a heavy oil is employed. 4. What is the best material to use in separating the sections of the secondary? A. Hard rubber disks. 5. Are there any means by which the voltage of the secondary wire of a coil may be determined? A. Widely different estimates are to be found of the voltage necessary to force a spark through various lengths of dry air. There is no rule giving a certain result for lengths beyond a few centimeters.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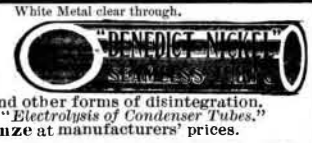

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