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(8659) C. S. asks: 1. Please answer the following questions. I do not know whether the name is correct, but I have heard that selenium, a metal, changes its resistance to electricity when light strikes it. Kindly inform me about the price, the resistance it offers per square meter of surface, and whether the supposition that it increases its resistance when light strikes it is correct; also how sensitive it is. A. Selenium is not a metal, but an elementary substance which in its ordinary condition is a brittle solid of a glassy luster and fracture and a brown color. It melts at about 430 deg Fahr, vaperizes at about 1300 deg., and burns with a blue flame, giving out an odor resembling that of putrid horseradish. Ordinary selenium is a very poer conductor, having an electrical resistance 37,500,000,000 times that of copper. When annealed for several hours at a temperature just below its melting point, with subsequent slow cooling, it forms a crystalline substance with a lower resistance. It is now sensitive to light. Its resistance is reduced, not increased, in proportion to the square root of the illumination; and also the effect is greater with a high electremetive force than with a low one. Narrew strips of annealed selenium are formed between the edges of broad plates of metal, so that the cress section is considerable, and thus the resistance is reduced while the area exposed to light is considerable. This is a "selenium cell." When the light strikes it, its resistance may be reduced as much as one-half. A cell whose resistance in the dark was 300 ohms dr•pped t• 150 ohms in the light. Such a cell is not a generator of electricity, but a measuring instrument for determining the intensity of light. 2. Also in what numbers of your Scien-TIFIC AMERICAN is there any article which treats on similar subjects as Stepianek's picterial telegraphy? 2. We can send you six numbers of the Scientific American Supple-MENT containing articles upon the transmission of pictures by electricity.

(8660) A. L. V. asks: 1. Will you kindly explain the action of the inductor alternator, of the type not having a large cylinder at one end? A. The toothed projections upon the moving portion are called the inductors. The surrounding frame has projections of the same shape and size, which constitute the cores of the armature coils. When these two sets of projections are opposite each other, the magnetic reluctance is at the minimum and the magnetic flux through the armature coils is at the maximum. Similarly, when the inductors are in the intermediate position, the flux is at a minimum. Thus the current is produced without moving wire, or collecting devices, with their attendant risk of chafing and loss of energy by friction. See Sheldon's "Alternating Current Machines," price \$2.50, by mail. 2. Why is it that, although the current from an X-Ray induction coil is alternating, the discharge passes through the tube in only one direction? A. The secondary current in an induction coil is not alternating when the discharge points are drawn out so far that the spark passes •nly when the primary circuit is breken. The current then is a succession of impulses all in the same direction, the current produced by the making of primary current is suppressed, The X-ray not being able to leap the gap. tubes used with direct current in the primary coil are all energized in this manner. current is unidirectional and discontinuous, and not alternating. 3. In the 110-volt alter nating-current system of incandescent light ing, why is it that, though the circuit is always complete through the primaries of the transformers, more power is required when more lamps are put in use on the secondary circuit? A. In any system of incandescent lighting by multiple arc, or parallel arrange ment, when one lamp is on, the resistance is such that only the current required for that lamp can flow; when two lamps are turned on, the resistance is half of what it was before, and twice as much current flows. More power is therefore required of the generator. lamps were lighted, the generator would not be called upon for any current, and it would run free, offering no resistance to motion except the friction of its armature shaft. This is true of all dynamos, alternating or direct.



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