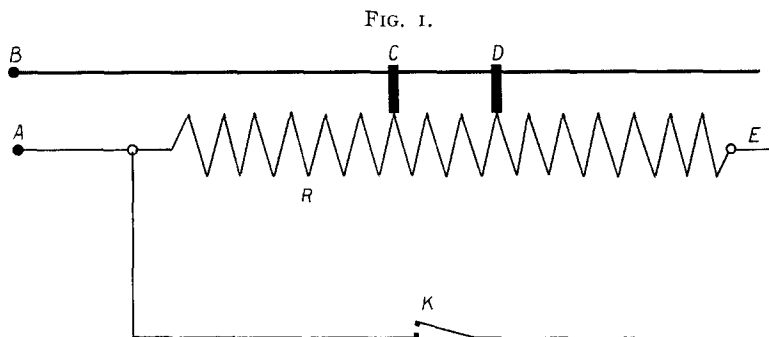


NOTES FROM THE LABORATORY OF PURE SCIENCE NELA RESEARCH LABORATORIES.*

A METHOD FOR INCREASING THE CARRYING CAPACITY OF A RHEOSTAT.

By W. E. Forsythe.

WHEN using an ordinary slide resistance to control a current it often happens that when the current is the largest only a small part of the resistance is being used. This may be disadvantageous for two reasons: In the first place, the smallest change possible in this small part of the resistance may greatly increase the current, and in the second place, the resistance may be very much overheated. To overcome these difficulties a method has been devised



whereby it is possible to use both ends of the rheostat and thereby double its carrying capacity and at the same time make current control easier and more accurate. In Fig. 1 is shown diagrammatically a slide rheostat with the additions necessary in order that both ends can be used.

The current ordinarily enters at the binding post A, passes through the resistance R and out at the binding post B through the slide C. As the slide C is moved towards A to increase the current, more and more of the resistance is cut out of the circuit and is not used. To change the rheostat so as to double

* Communicated by the Director.

its carrying capacity put on a second slide, *D*, a second binding post, *E*, at the end of the rheostat opposite *A* and a switch, *K*, so connected that when it is closed the two binding posts, *A* and *E*, are connected. To operate the rheostat proceed in the ordinary manner (switch *K* open) with the current entering at *A* passing through the resistance *R*, the slide *C* and out at *B*. To increase the current, move this slide towards *A* until it has passed over three-fourths of the distance from *E* to *A*. To obtain a larger current move both slides to the centre of the resistance *R* and close the switch *K*. The resistance will be about the same as it was with one slide and one-fourth of the resistance in use. The current will be divided at *A* and one-half of it will enter at *E* and pass out at *D*, the other half entering at *A* and passing out at *C*. To increase the current move either slide *C* towards *A*, slide *D* towards *E*, or move the two slides farther apart. If a better control of the current is wanted increase the current to about the desired value by moving but one slide and make final adjustment by sliding the second contact forward or back.

Two such rheostats have been made in Nela Research Laboratories and used regularly for a year or more and found convenient and satisfactory. It is often convenient to control a current of fifty to sixty amperes with a rheostat originally constructed to carry but thirty.

CLEVELAND, OHIO,

March, 1922.

An Interesting Case of Mechanical Disintegration Caused by Positive Ions. H. P. WARAN. (*Phil. Mag.*, January, 1922.)—

The capillary of an ordinary Pluecker tube, with a pressure of a few mm., was placed between the conical poles of an electromagnet. When the tube was traversed by an unrectified current from an induction coil, the electron stream was deflected first against one side wall of the glass and then against the other. When an especially strong current passed, it took only a few seconds for a gray patch to develop on the glass "indicating a corrosion of the glass under the sand-blast action of the ions." A quite definite fish-bone pattern is produced, but the arrangements on the two sides of the glass tube are reversed. "There can be little doubt that this grooving of the glass was effected by the bombardment of the massive positive ions which travel in opposite directions in the two streams causing grooves that converge in opposite directions."

G. F. S.