

difficulties with *leakage* and *retardation* increase, until the speed and certainty of signalling are largely reduced. Under such conditions it was formerly necessary to retransmit all communications at some intermediate station, but this duty is now performed by an instrument called a *repeater*.

Ques. What is a repeater?

Ans. A *sounder* provided with a *circuit maker*, for synchronously controlling a second circuit.

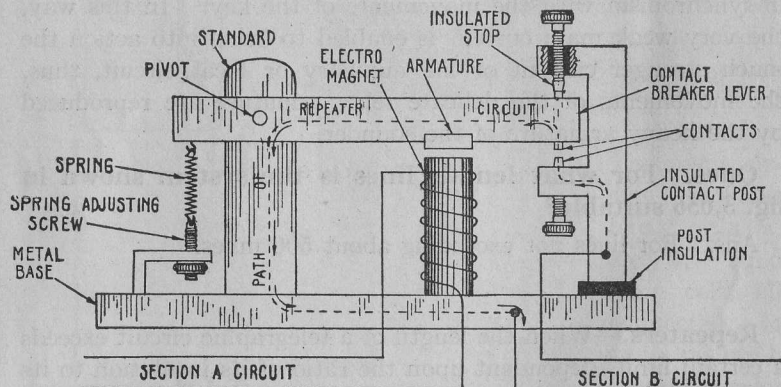


Fig. 3,057.—Elementary repeater showing the insulated parts essential for the contact maker, and path of the current through the repeater portion of the instrument. The insulated stop on the upper arm of the contact post is shown in sectional view to clearly indicate the insulation at this point. Compare this instrument with the elementary sounder fig. 3,051 and note the essential points of difference.

That is to say, it is simply a piece of apparatus in which the sounder (or in some cases the relay), receiving the signals through one circuit, opens and closes the circuit of another line, in the manner that a relay opens and closes the auxiliary circuit of a sounder.

Ques. Describe a simple repeater.

Ans. As shown in fig. 3,057, it consists essentially of a sounder of the same construction as in fig. 3,051, with the exception that the contact post is insulated and is provided with an insulated

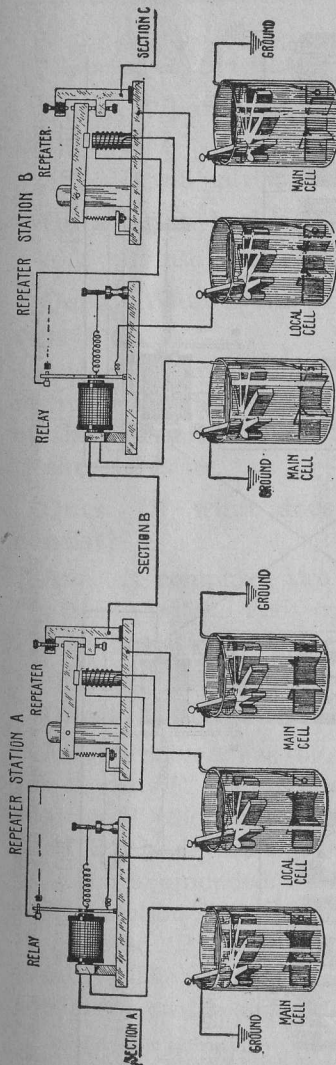


Fig. 3,058.—Elementary repeater as connected in a circuit. In operation, if the home station or beginning of section A line send a message, the movements of the relay at station A will cause similar movements of the repeater, this in turn is repeated at station B, and all other stations on the line.

stop, thus forming a contact maker for the repeating section of the circuit. As indicated by the dotted line and arrows, the path of this circuit is (when closed) through contact post, contacts, contact maker lever, pivot, standard, and out through base.

Fig. 3,058 shows how the elementary repeater shown in fig. 3,057 is connected in the circuit.

As shown, the line is divided into a number of section A, B, C, etc., depending upon its length, there being a repeater station joining each section to the preceding one.

The end of section A is connected to the relay main circuit, and the auxiliary circuit to the electromagnet of the repeater.

There is a ground return on main circuit, and metallic return on auxiliary circuit, one or more cells being included in each of these circuits as shown.

The contact maker circuit of the repeater (which corresponds to the auxiliary circuit of the relay) is connected to section B and ground.

At the end of section B is another repeater station identical with the one just described,