



## Remagnetizer for Ringer Magnets

By O. H. DANIELSON

*Telephone Apparatus Development—Electromechanical*

**T**HE audible signal which notifies a telephone subscriber of an incoming call is produced by a "ringer." This is an electric bell in which the clapper, as it vibrates, strikes alternately a pair of gongs. The clapper is driven by the armature of a double coil electromagnet. The armature itself and the cores of the electromagnets are biased by an associated permanent magnet. The ringer is operated by a low-frequency alternating current and the magnet coils are wound so that this current alternately strengthens the pull of one core on the armature and then that of the other. This makes the armature vi-

brate and rings the bells. To prevent the armature from operating from other currents it is mechanically loaded in one direction by a biasing spring. For satisfactory operation the strength of the permanent magnet must be maintained above a definite limiting value.

In the manufacture of ringers the permanent magnet is magnetized after the assembly. As a result, however, of later handling and particularly of demagnetizing influences encountered during service it sometimes happens that the strength of the permanent magnet is reduced sufficiently to impair the operation of the ringer. In the

past it has been necessary to return the subscriber set to the nearest shop of the Western Electric Company when remagnetization is needed.

Recently a simple remagnetizer was devised which was operated by dry cells and could be used on ringer magnets without removing the ringers from subscriber sets. The experimental use of this device resulted in such general improvement in the capabilities of ringers that the development of a similar tool was undertaken by the Laboratories for use in Telephone Company storerooms and on the subscribers' premises. It was anticipated that such a tool would reduce ringer maintenance costs and would result in a general improvement in the quality of ringers. Early in the development it was suggested by I. C. Pettit that a device using a cobalt

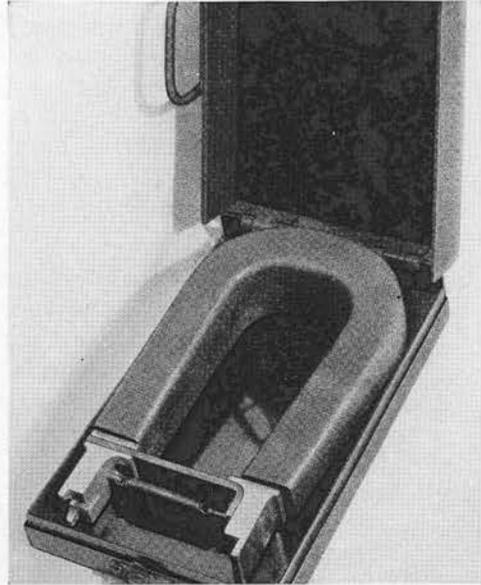
steel magnet would accomplish the desired degree of remagnetization with a possible saving in weight and the elimination of direct current.

The remagnetizer as constructed (coded the No. 481A Tool) consists



*Fig. 1—The remagnetizer can be used on ringers assembled in the subscriber sets housed in metal and phenol plastic boxes*

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*Fig. 2—The sheet steel carrying case also serves as a keeper for the magnet and as a magnetic shield*

essentially of a "U" shaped permanent magnet of cast cobalt steel and a pole-piece assembly which are illustrated in Figure 2. The pole-piece assembly comprises two soft steel pole-pieces designed to fit on the ends of the ringer magnet and a forked-shape phosphor bronze tie bar which is permanently fastened to one of the pole-pieces. The forked portion of the tie bar slides in grooves in the sides of the other pole-piece and the pole-pieces are drawn toward each other by means of a helical spring. This self-adjusting feature insures a snug overlapping as well as butting contact between the pole-pieces and the ends of the ringer magnet. As generally used the pole-

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piece assembly is fastened permanently to the cobalt steel magnet by means of a screw which passes through one pole-piece and is threaded into one of the pole-faces of the permanent magnet. A single application of the device to a ringer magnet is all that is required to accomplish remagnetization.

Another arrangement of the tool involves applying the pole-piece assembly to the ringer magnet before the magnetizing magnet is brought into contact with the pole-piece. This facilitates the use of the remagnetizer on ringers in inaccessible locations. With this arrangement the screw which ordinarily fastens the pole-piece assembly to the magnetizing magnet is replaced by a threaded dowel pin. This serves to locate the magnet properly and to prevent it from being

accidentally reversed with consequent changes of the ringer's polarity. The pole-piece assembly is first fitted to the ringer magnet, after which the magnetizing magnet is applied.

A sheet steel carrying case, which also acts as a keeper for the magnet as well as a magnetic shield, is provided for the tool. The accumulation of magnetic materials on the magnet and the accidental magnetization of watches when the tool is not in use is thus avoided. The total weight of the tool and the carrying case is about  $7\frac{1}{2}$  lbs. of which the magnet accounts for approximately  $4\frac{3}{4}$  lbs.

This tool has been tried out by all of the associated Telephone Companies with results which have been so promising that it has now been made available for general use.

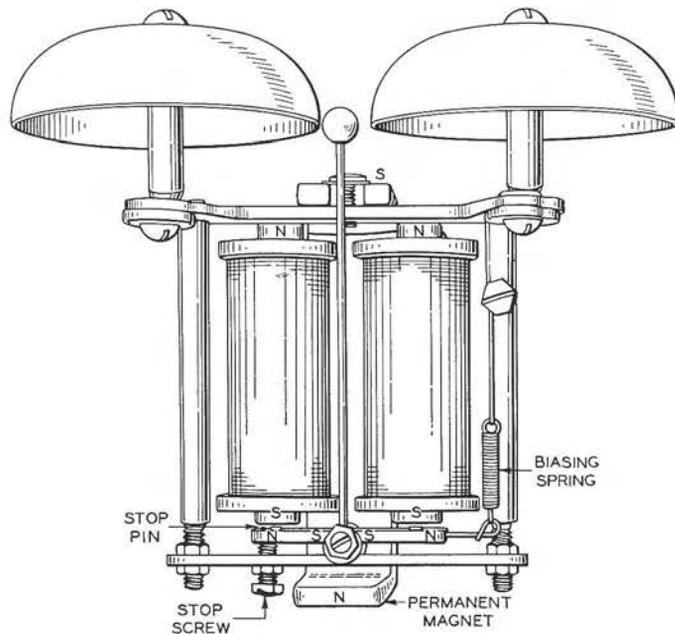


Fig. 3—The “ringer” consists of a pair of gongs which are struck alternately by a clapper attached to the armature of a double coil electromagnet. The armature and cores of this electromagnet are biased by a permanent magnet and a spring and stop keep the bells from being rung by unwanted currents