

FIG. 5.

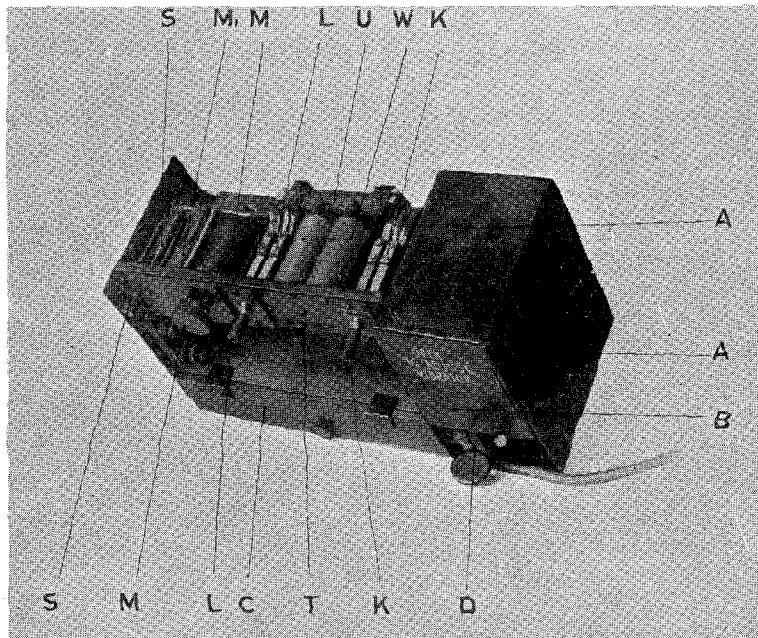
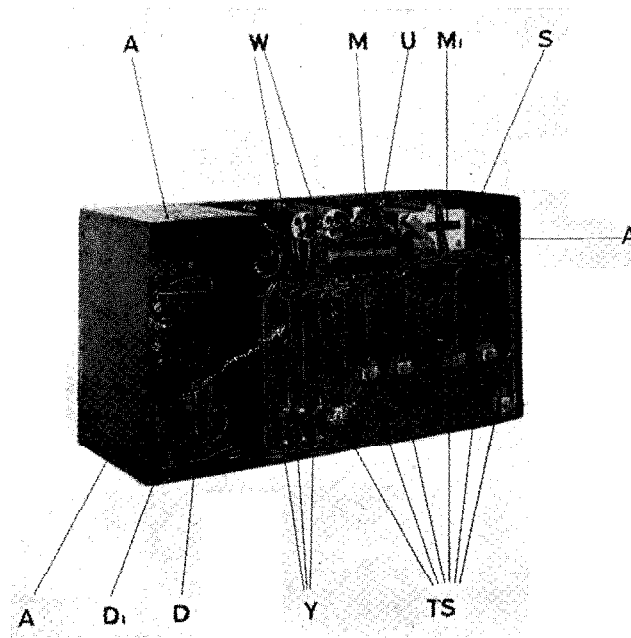


FIG. 6.



3. Certain of these component parts require further description. These are :—

- D ... The Morse Key. This is of special type, hinged at the front so as to turn to the operator's right for closing the lid of instrument (Fig. 3—D).
The beat and tension on the key are adjusted from the back (see Fig. 6—D1). The operator should usually not touch these.
- G ... The receivers are the standard E or W receivers, fitted with a clamping screw to adjust the leather head band to the operator's head (Fig. 1).
- J ... The clip J (Fig. 1) is pushed up under the operator's chin when 'phones have been adjusted to fit his ears. To release the pressure on the ears the upper projecting part of the clip is pressed and the clip drawn downwards away from the chin.
- K and L These are the ordinary type of telephone exchange switches with the necessary number of springs.
- M ... The Potentiometer (Figs. 5 and 6). This consists of a winding of 250 ohms. of enamelled wire on a cylindrical ebonite drum, M1. This drum is capable of sliding in a horizontal direction in bearing guides and is pressed up against another cylinder M by two springs. This cylinder, M, carries one spiral turn of bare wire and by revolving M contact can be made at any point along the length of M1.
- U ... The induction coil. This consists of a primary winding of 1.5 ohm. and a secondary of 75 ohms.
- W ... The choke coils are each wound to an ohmic resistance of about 750 ohms. and their inductance is about 2.4 henries with a current of 1 milliamp. at 475 frequency.
- X ... This is a buzzer similar in general appearance to the D, Mark III buzzer, but differently connected and wound. It has two windings only, one being 1.6 ohms. of 29 S.W.G., D.S.C., and the other 11.8 ohms. of 29 S.W.G., D.S.C. Both coils are used in series to drive the buzzer for chopping, and the small one (Fig. 4—XI) alone for calling. There are two adjustable contact screws marked 1 and 2. No 1 is the driving contact and should always be adjusted first. No. 2 is the chopping or Fuller-phone contact. The back of the buzzer (Fig. 6) is easily accessible for test or repair.
- Y ... These condensers are each of 1 microfarad.

Z ... The cells are "Cells, electric, inert, S," and should be kept vertical when the instrument is in store. Fig. 4 shows the functions of the cells—the Buzzer Battery has the hardest work to do and if it shows signs of failing can be exchanged for any of the others without much harm to the general working. Cells can thus be made to last a very long time by giving them each a turn as buzzer Battery.

CHAPTER II.

TECHNICAL DESCRIPTION.

3. *Theory of Fullerphone.*

1. The Fullerphone consists essentially of a device for changing at the receiving end, a steady current into an intermittent current suitable for producing a note in the telephone receiver, while at the same time allowing the current in the line to remain steady.

The receiving circuit is shown in Fig. 7. Ch1 and Ch2 are choking coils, K1, K2, and K3, are condensers, R is a double head receiver, and X is an interrupter which breaks the circuit several hundred times a second.

The interrupter may be driven by any means, either electrical or mechanical. In the service patterns it is driven electrically, having two contacts on the armature, and is worked by a local cell.

2. If a steady E.M.F. is applied between line and earth, and the circuit is closed at X, a steady current will flow through the choke coils, contact 2, and receiver. If the circuit is broken at X, the current cannot flow through the receiver but will flow into and charge the condensers. When the circuit is again closed at X the condensers partially discharge through the receiver R.

3. When the interrupter X is working we therefore get an intermittent current in the receiver, giving an audible note, while (if the choke coils and condensers are suitable) the line current alternately flows through the receiver and into the condensers, and remains practically constant and continuous in the line. The result is that the dots and dashes sent by the single current morse key at the far end are received as short or long notes in the telephone receiver at the receiving end, while the current in the line is of much the same nature as that sent by ordinary single current morse set, except that it is very much smaller, as readable signals can be obtained with about half a microampere. In practice a main battery of one dry cell is used.

4. At the sending end when the signalling key is pressed, a sending battery of one cell B is joined in series with the key, the interrupter X, the head receivers, choke coils, secondary L_1 and L_2 . The condensers are connected in bridge across the whole arrangement, as

FIG. 7.

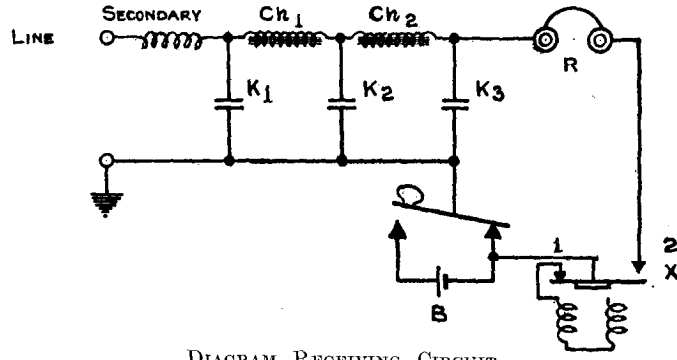


DIAGRAM RECEIVING CIRCUIT.

FIG. 8.

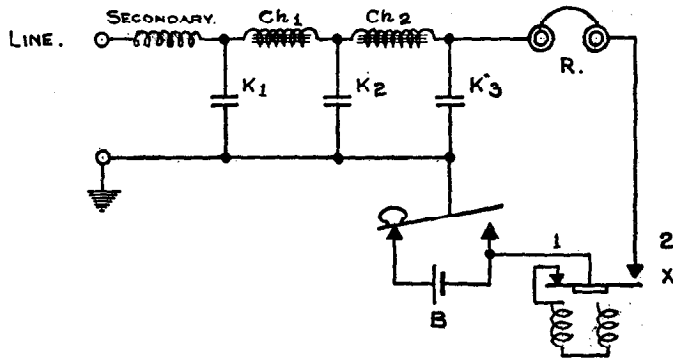


DIAGRAM TRANSMITTING CIRCUIT.