Telephone Coin Collecting Boxes.

Continued from page 106.

IN order to simplify the instructions to the public and relieve them of manual operations so far as effective calls are concerned, a coin box has been introduced in which a relay is provided to perform automatically the function of the hand-operated "A" button in the two-button type.

The Hall Prepayment Multi-Coin Collecting Box. One Button Type.

With the One Button design the caller lifts the receiver from the switch-hook, inserts the calling fee, and is then in communication with the exchange in a manual C.B. system or, by dialling the required number, with the called subscriber in an automatic system. In the case of a successful call the money is automatically deposited without the intervention of the operator or any manipulation on the caller's part, and in the event of an ineffective call the caller secures the return of his fee by pressing the refund button " B."

As will be seen from Fig. 6 the one-button collector is generally similar in design to the two-button type but includes the special relay *R* which performs the function of the "A" button. This relay consists of a fixed magnet in the field of which is placed a rotary armature bearing a coil and fitted with a U-shaped extension piece 1–2. According to the direction of the current passing through the coil the *U* piece will move to the left or the right.

The operation of the coin slot crank arm by the act of inserting the calling fee ensures that the movable coin container *CC* is in its correct normal position (as shown) where it is retained by the catch *C*1 If not so retained *CC* would move to the extreme left under the force of gravity

The depression of the catch *C*1, which is pivoted by the slotted screw, will permit the container to move slightly to the left until its projection engages with the hooked portion of *C*2. In this position it is again held but is now clear of *C*1 In a similar manner if *C*2 be depressed the coin container is held by *C*1, while *C*2 is held clear of the projection on *CC* by the lever *L* engaging with the upper pin on *C*2. To deposit the money the container must move to the extreme left, which takes place upon its release from both *C*1 and *C*2 by the action of the relay armature. The depression of button " *B* " moves it to the right and refunds the money in the case of an ineffective call.

Circuit Operation on an Automatic Exchange. Calling fee—one coin. Figs. 6 *and* 7

The operation of the one-button type of coin box when used on an automatic system in which the current in the calling line is reversed when the called subscriber replies is as follows.

The removal of the receiver operates the switch hook connections and the calling fee will rest upon the balance arm, operate it, and open the short-circuit across the dial. The caller is now able to dial the subscriber he requires. At the same time the current flowing through the relay moves the *U*-piece to the left, depresses *C*1, and permits the container *CC* to move slightly to the left clear of *C*1 During the dialling process auxiliary

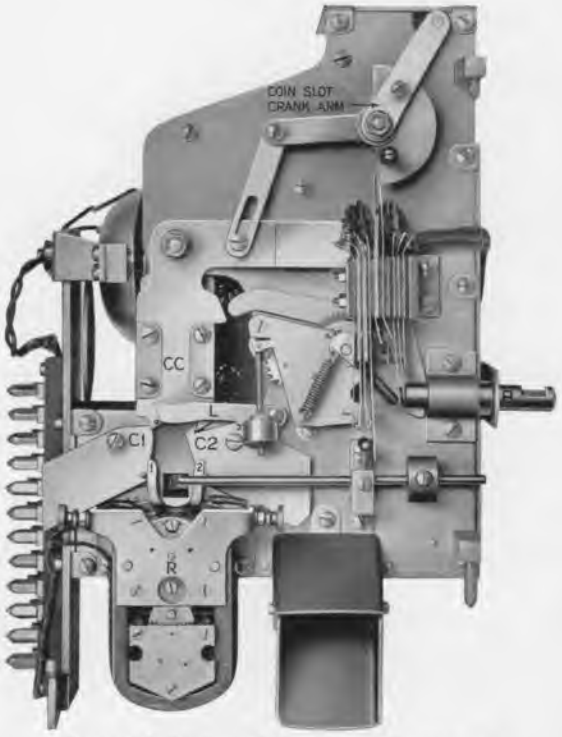


Fig. 6.—Mechanism of One-Button Prepayment Coin Collector.

springs of the dial place a short-circuit across the relay and the signalling transmitter.

When the called subscriber replies the current in the calling line is reversed, thus reversing the movement of the *U*-piece. The latter in turn acts upon *C*2, depresses it, and releases the coin container which moves to the extreme left and deposits the money At the same time the short-circuit is re-imposed across the dial and relay

If the call is ineffective the current in the calling line is not reversed and the money is returned to the caller on pressing button *B*. This action also disconnects the line for a few seconds, after which the circuit connections are restored to normal.

It will be seen from Fig. 6 that the release of the coin container *CC* is brought about by the successive movements of the two catches *C*1 and *C*2 and that it is immaterial in

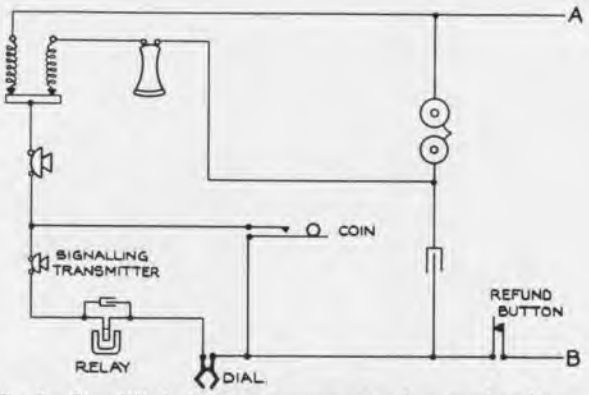


Fig. 7.—Simplified circuit arrangements when employed on an automatic system.

which order these catches operate. The result of this arrangement is that the circuit and the operation of the coin box are not affected by an accidental crossing of the lines. Further, the depositing relay is slow-acting and premature cashing of the money by a momentary reversal is thereby avoided.

In cases where Trunk or other services are required the caller will gain the attention of the manual operator by dialling "0" without previously inserting the calling fee, this facility being given by the use of the special dial already described. The necessary Trunk or other fees will be checked in by gong signals and when the final switching arrangements have been completed will pass into the cash box.

The One-Button Box is equally suitable for *C.B.* manual systems.

In the case of exchange systems which do not provide for the reversal of the current in the calling line when the called subscriber replies it is necessary to fit an additional relay at the exchange to perform this function. This relay should preferably operate at the time the metering of the call takes place.

Referring again to the provision of facilities whereby the manual operator may be called without the insertion of the calling fee, this

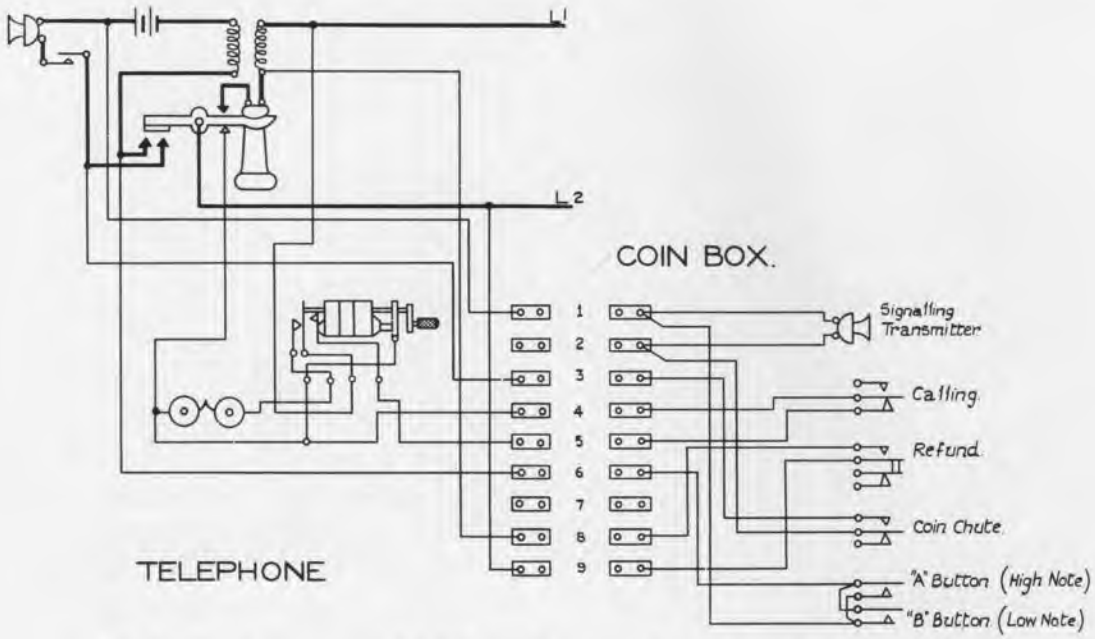


Fig. 8.—Circuit arrangement of Two-Button Prepayment Coin Collector for magneto systems.

discrimination presents no serious difficulties as regards other free calls than those for which "0" dialled. For instance, in a four digit system it is possible to use one, two or three digit numbers for free calls and prevent the transmission of four digits unless the appropriate fee has been inserted. The special dial for this purpose includes a device which counts the number of digits dialled and after a predetermined number has been sent places a short-circuit across the impulse springs unless the proper fee has been inserted.

The Hall Prepayment Multi-Coin Collector Buttonless Type.

In this collector, as its name implies, both the "*A*" and "*B*" buttons have been eliminated. It has already been explained how the *A* button has been displaced in the one-button type and it is only necessary to say that with the buttonless box the act of hanging up the receiver returns the money to the caller in the case of an ineffective call.

The Hall Prepayment Multi-Coin Box for Magneto Systems. Two Button Type.

This box consists of the standard mechanism with two additional features whereby distinctive signals are given to the exchange operator to indicate whether the "*A*" or the "*B*" button has been operated by the caller The circuit arrangements are shown in Fig. 8.

Assuming the calling fee to be one coin the receiver is removed and the coin inserted in the box. The removal of the receiver operates the usual switch-hook connections and the coin closes contacts 2–3 and opens contacts 4–5. Contacts 2–3 bring the signalling transmitter into the primary battery circuit, and contacts 4–5 remove the short-circuit across the generator and allow the exchange to be called in the usual way When the attention of the called subscriber has been obtained the caller will at the request of the operator press button "*A*."

This action will deposit the money in the cash box and, by means of flexible contact springs suitably adjusted to give a high frequency note, will cause the appropriate signal to be sent to the operator

In the case of an ineffective call the money will be returned by pressing button "*B*." This results in the transmission of a low frequency signal to the operator, warning her that the coin is being withdrawn. At the same time contacts 8–9 are closed and place a temporary short-circuit across the caller's receiver.

It is not necessary, of course, in normal circumstances for the operator to know that the fee has been returned to the caller in the case of an ineffective call, but the refund signal ensures that if the caller presses button "*B*" instead of button "*A*" the error will not pass undetected by the operator.

Payment made in addition to the calling fee, *i.e.* for Trunk calls, etc., is checked into the cash box by means of gong signals as in the case of the standard prepayment type of collector In exchange areas where the calling fee consists of two coins the first one closes contacts 2–3 and the second one opens contacts 4–5.

The Hall Postpayment Multi-Coin Box. Buttonless Type.

This coin box is similar in general appearance to the standard box shown in Fig. 1 but, as payment is made only after a call becomes effective, it is not necessary to hold money under the control of the caller and it is passed direct to the cash box. The elimination of the *A* and *B* buttons thus made possible simplifies the mechanism and makes it practicable to produce a postpayment collector which is comparatively inexpensive.

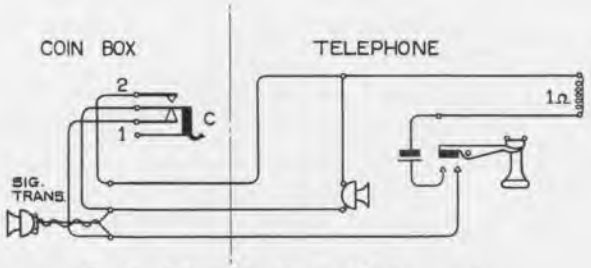


Fig. 9.—Schematic circuit of Postpayment Coin Collector.

The connections of the coin box and the primary circuit common to most telephones used on local battery systems are shown in schematic form in Fig. 9. The attention of the operator is gained in the usual way and after the required subscriber has been obtained the operator requests the caller to insert the necessary fee. The coins on insertion operate the coin slot crank arm which in turn acts upon the centre spring *C*, moving it from 1 to 2. This removes the short-circuit from the signalling transmitter and imposes one across the speech transmitter of the telephone, a condition which is maintained for a few seconds by means of a timing device. The coins in falling strike distinctive gongs as in the case of the two-button type of box already described, and the signals transmitted to the operator by the signalling transmitter enable her to check in the correct fee. At the end of the period during which the timing device has introduced the signalling circuit, normal conditions are automatically restored and the short-circuit removed from the speech transmitter

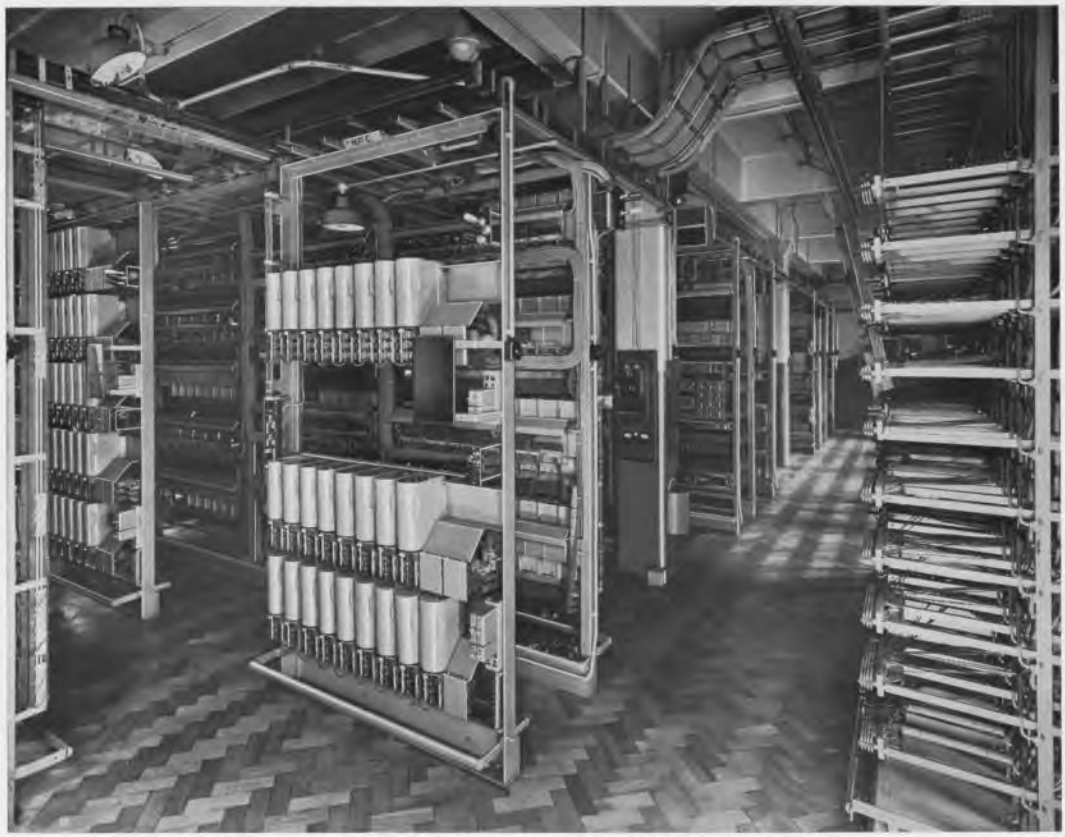
The standard collector is provided with three coin chutes, but in the event of only one being required it is usual to cover up the remaining slots by an easily removable plate until such time as development in the service makes it desirable to bring the three chutes into use.

Self-sealing Cash Container.

Some Telephone Administrations prefer that their collecting officers shall not have access to the money in the coin box, and to meet this requirement special self-closing cash boxes have been designed. These are cylindrical in shape and are secured to the mechanism by means of a bayonet fitting in such a way that, by putting the cash box into place, a key permanently fixed in the case enters the lock in the cash box. When the cash box is turned to its correct position, an aperture is opened for the passage of money from the mechanism into the box.

Before the container can be withdrawn from the case a half-turn has to be given, which automatically closes and locks the aperture of the cash box, the key for which may be kept at the cashier's office.

Manchester Director Area.



Selector equipment at Gatley Exchange, the most recent installation in the Manchester Director Area completed by The General Electric Company. Another view appears on page 126.