Dec. 4, 1934. W. J. HEITSMITH 1,982,735

TELEPHONE COIN SYSTEM

Filed March 7, 1934

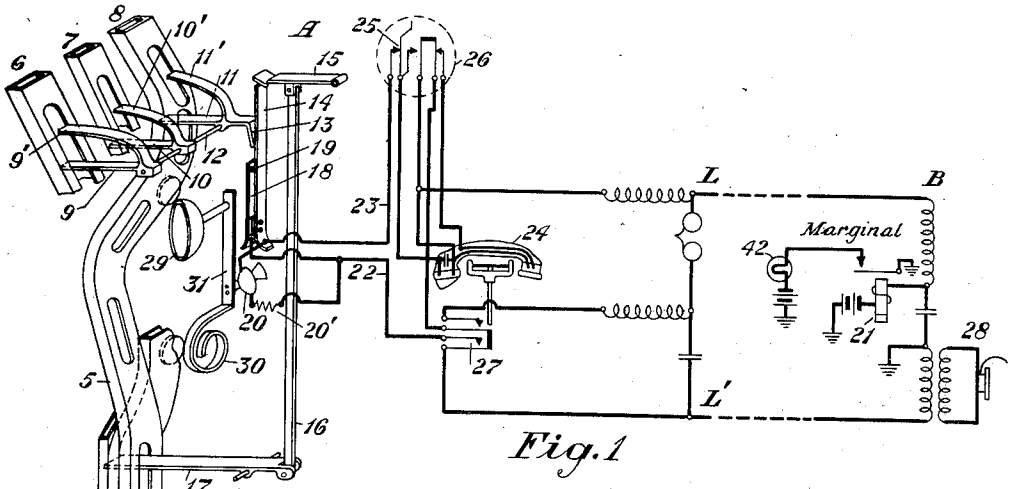


Fig. 1

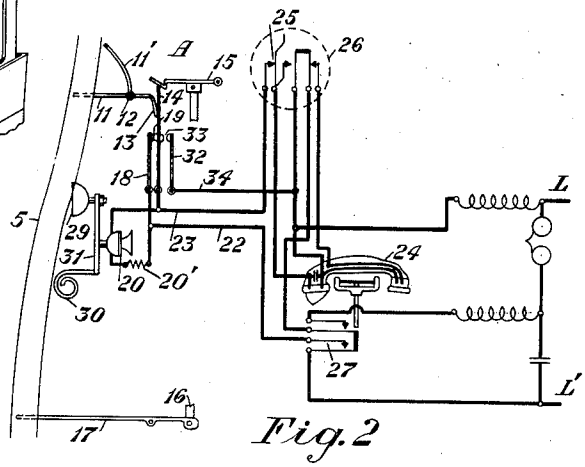


Fig. 2

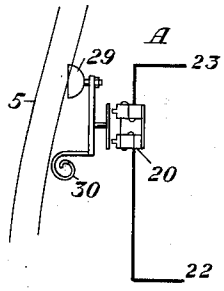


Fig. 3

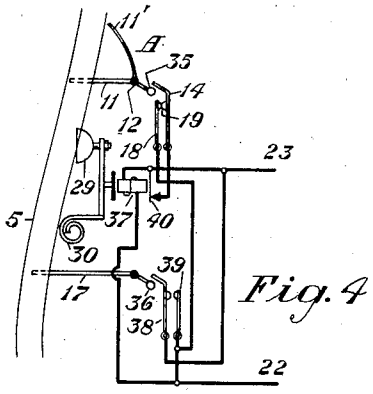


Fig. 4

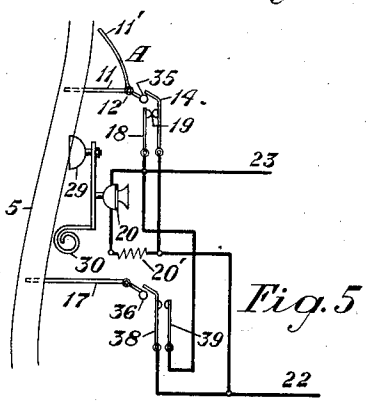


Fig. 5

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TELEPHONE COIN SYSTEM

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12 Claims. (Cl. 179—6.3)

This invention relates to telephone systems, and more particularly to systems wherein mechanism is located at a substation for receiving coins of different denominations.

It is one of the objects of the invention to provide a system of the above character in which the substation circuit includes a handset and associated equipment.

Another object is to provide signaling mechanism at the substation whereby the central office operator is apprised of the denominations of the coins deposited.

A further object consists in minimizing interference in the talking circuit due to the transmission of coin sound signals thereover.

A further object consists in connecting the signaling mechanism at the time a coin is deposited and in disconnecting it after the coin signal has been given, thereby avoiding transmission losses and also fraudulent operation.

These and other objects will be apparent from the following description when considered in connection with the accompanying drawing, in which certain embodiments of the invention are illustrated.

Referring to the drawing, Figure 1 is a diagrammatic illustration of a coin station shown with line conductors extending to a central station and Figs. 2, 3, 4 and 5 are modifications of Fig. 1. The central station connection and details of the coin chute illustrated in Fig. 1 being common throughout all of the figures, these portions are omitted from Figs. 2, 3, 4 and 5.

The coin collecting arrangement herein shown is adapted for use in connection with prepayment service such as disclosed in Patent No. 1,043,219, November 5, 1912, Forsberg, or in connection with post-payment service such as disclosed in Patent No. 1,376,814, May 3, 1921, Jacobsen. For the purpose of simplification the coin collecting and refunding mechanism and associated arrangements have been omitted. For the purposes of this invention coin collecting mechanism is shown at each of the local subscriber's stations illustrated in the several figures of the drawing. The stations are each connected over line conductors L and L' and through typical switching equipment, such as disclosed in the publication "Automatic Telephony", 1914, Smith and Campbell, page 118, Fig. 95, through a central station B to a called station. The central station is shown in Fig. 1 for the purpose of illustration as terminating at an operator's position. The coin station apparatus as more specifically shown in Fig. 1, includes a plurality of coin chutes 6, 7 and 8, each of which is adapted to receive a coin of a particular denomination and convey it to signal controlling apparatus. The coin stations are each provided with a plurality of levers 9, 10 and 11 which are pivoted on a common shaft 12 as shown in Fig. 1. The free ends of the levers 9, 10 and 11 project into the various chutes, one lever for each chute. Fingers 9', 10' and 11' are provided for the respective levers, and each of these fingers is adapted to enter the chutes when any of the levers is depressed under the weight of a coin. When the fingers so enter the chutes the progress of any additional coin down the chutes is arrested. A lever 11 is shown as provided with a lug 13 (Figs. 1 and 2) for the purpose of illustration, it being understood that this lug may be connected to any point so that it may be common to the shaft 12. The levers 9, 10 and 11 are positioned below the points where coins are rejected. The lug is caused to rotate with the shaft 12 and engage a spring 14 when any one of the levers is depressed under the weight of a coin which makes contact therewith in its downward passage in any of the chutes. Additional coins are arrested in the chutes at this time by the fingers 9', 10' and 11' as previously described. The spring 14 is moved to the right when thus engaged by the lug 13 and its free end is held in locked position by the tongue of a pivoted latch 15. An arm 16 is pivotally connected at one end to the latch 15 and at its other end to a trigger 17. This trigger is pivotally mounted and its free end projects into the various chutes and is depressed upon the passage of a coin through any of the chutes. When the trigger is thus actuated, it causes the arm 16 to move upwardly and unlatch the members 14 and 15. The passage of a coin through the chutes 6, 7 or 8 in this manner separates springs 14 and 18 and opens the zero resistance shunt at contact 19 around auxiliary transmitter 20 and resistance 20', thereby placing these elements in the coin signaling circuit. This circuit extends from battery at the central station B, winding of marginal relay 21, one winding of repeating coil, line conductor L, one winding of substation induction coil, transmitter element of handset 24, pulsing spring 25 of dial 26, lead 23, auxiliary transmitter 20, resistance 20', switch hook contact 27, line conductor L', other winding of repeating coil to ground. The resistance 20' and the transmitter 20 effect a change in the signaling circuit which causes the release of the marginal relay 21 in the central station. The release of the marginal re-

lay 21 may be utilized to signal the central station operator, by lighting lamp 42 or may be used to control mechanical equipment in a manner similar to that disclosed in Patent No. 1,376,814, May 3, 1921, Jacobsen. The closing of this circuit also completes a connection with the central station operator by means of the receiver 28 so that audible signals may be transmitted from the coin station to the central station B in a well known manner.

The coin signaling circuit being prepared, as above outlined, is adapted to reproduce audible signals, and the coin traveling downward in any of the chutes, after operating the lever 6, 7 or 8 will sound a signal such as a bell 29 or a gong 30 as the case may be. The bell and gong are inter-connected by the strut 31 or the like, and the auxiliary transmitter 20 is mechanically connected with the member 31. The signal given by the bell or gong is transmitted to the central station B over said signaling circuit and the operator is apprised of the denomination of the coin deposited by virtue of the particular signal which has been sounded. The coin continues its downward travel after sounding the signal and strikes the trigger 17 which causes the link arm 16 to be raised, thus unlatching the members 14 and 15, re-establishing contact 19. The coin may now be collected or refunded in the usual manner where prepayment coin boxes are used utilizing for this purpose the usual coin disposal equipment, which as mentioned above has been omitted for simplicity. It is desirable to increase the length of time the resistance 20' is included in the circuit over the conductors L and L' to insure the release of the marginal relay 21 or other signal controlling element such as in cases where post-payment coin boxes are used such as is disclosed in the Jacobsen patent previously referred to. The time element involved in the passage of the coin between any of the levers 9, 10 or 11 and the trigger 17 may be varied by construction so, as to be suitable for the particular condition at the central station ample for this purpose. Contact 19, upon being reestablished, restores the short circuit about the auxiliary transmitter 20 and resistance 20', thereby removing them from the circuit. It will be obvious that the auxiliary transmitter is connected with the talking circuit for a period of time sufficient for the central station operator to hear the coin signals, and it is then disconnected after such signals have been transmitted to prevent transmission interference due either to the audible vibrations of the bell 29 or gong 30 or to the resistance of the auxiliary transmitter.

The system illustrated in Fig. 2 is similar in operation to that shown and described in connection with Fig. 1, with the exception that in Fig. 2 the usual subscriber's transmitter of handset 24 is short-circuited during the transmission of the coin tone signals. This is accomplished by the closure of contacts 33 when the coin actuates any of the lever arms and causes the rotation of the shaft 12 and the latching engagement of the springs 14 and 15. This engagement of the springs causes the opening of contact 19 of spring 18, as previously described, and the closure of contact 33, between the springs 14 and 32. The closing of contact 33 establishes a zero resistance circuit around the transmitter element of the handset 24. The opening of contact 19 removes the zero resistance circuit around the auxiliary transmitter 20 and resistance 20' and thus connects the auxiliary transmitter and resistance in the coin signaling circuit over the conductors L and L' to the central station B, as previously described. The short circuiting of the transmitter element 24 is completed over a path extending from one lead of transmitter element of handset 24, lead 34, spring 32, contact 33, spring 14, lead 23, dial 26, to other lead of transmitter element 24. This short circuit prevents fraudulent signaling by means of tones simulating coin signals by the subscriber through the agency of his telephone instrument.

Fig. 3 illustrates an electromagnetic transmitter which functions in the well known manner. This form of transmitter may be substituted for the auxiliary coin signal carbon-type transmitter 20 shown in Figs. 1, 2 and 5. The circuit operation of Fig. 3 is similar to that outlined in connection with Fig. 1.

The modification illustrated in Fig. 4 shows the shaft 12 as having a weight 35 connected therewith to retard the restoral of any levers extending into the coin chute similarly to the levers 9, 10 and 11, shown in Fig. 1. The trigger 17 is similar to that shown in Fig. 1, but has a weight 36 to said shaft which retards its restoral. The action produced by the weights 35 and 36 introduces a time interval upon the passage of a coin through the chute 5. This interval is sufficient to permit the transmission of a coin signal to the central station operator or to mechanical equipment and to then restore the line to normal after the coin has passed the trigger 17. The combined electromagnetic transmitter and relay 37, similarly to the auxiliary transmitter 20 in Fig. 1, is mechanically connected to the bell 29 and gong 30. The member 37 in addition to functioning as a transmitter also serves as a relay which opens and closes contact 40 to insure the inclusion of said member 37 in the circuit in the event of the premature restoral of any of the levers such as lever 11, before the coin has actuated trigger 17. In the operation of the mechanism disclosed in Fig. 4, the lever 11 is depressed under the weight of a coin, thereby causing weight 35 to separate springs 18 and 14 opening contact 19. The opening of contact 19 removes a short circuit around the element 37, thereby causing it to function as a relay in order to open contact 40. The transmitter element 37, is now adapted to transmit coin or audible signals over the lines 22 and 23 as shown in Fig. 1 and thence over lines L and L' to the central office B as described in connection with Fig. 1. The coin, continuing its passage down the chute, contacts with the bell 29 or gong 30, and then strikes the trigger 17. This causes the trigger to be depressed and actuate weight 36 to a position in contact with spring 38, which spring is moved against spring 39, thereby completing a short circuit around element 37. This element then releases and is then disconnected from the signaling circuit over conductors 22 and 23, and from conductors L and L', as described in connection with the auxiliary transmitter 20 in Fig. 1. The coin actuating the lever 11 thus causes the insertion of the element 37, and the operation of the trigger 17 causes the removal of said element.

The modification shown in Fig. 5 is similar in operation to the inertia arrangement disclosed in Fig. 4. In this instance, an auxiliary transmitter 20 similar to that shown in Figs. 1 and 2 is mechanically connected to the bell 29 and gong 30. The passage of a coin through the chute 5 actuates the lever 11 and its associated weight 35, strikes the bell 29 or gong 30 and then depresses

the trigger 17 and its attached weight 36. A time interval is thus provided similar to that described in connection with the arrangement disclosed in Fig. 4, whereby the coin signal is then restored to normal after the coin has passed the trigger.

While the arrangements have been herein disclosed and described in connection with handset equipment, it will be obvious that they are equally adapted to be used with other types of telephone sets.

What is claimed is:

1. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a chute for receiving a coin, a signaling device actuated by coins passing through said chute and emitting sounds to indicate the coin has been deposited, means for transmitting such sounds to the central station over the line circuit, and switching means actuated upon the deposit of a coin for connecting said first mentioned means to the line circuit and for disconnecting said first mentioned means after the sounds have been transmitted.

2. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, signaling mechanism in the collecting device for transmitting an audible tone to the central station to denote the denomination of the coin deposited, and coin actuated levers extending into said chutes for connecting the signaling mechanism to the line circuit to transmit said tone and to disconnect said mechanism after the tone has been transmitted.

3. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, signaling means actuated by coins passing through said chutes and emitting sounds in accordance with the denomination of the coin deposited, means for transmitting such sounds to the central station over the line circuit, and levers extending into said chutes for connecting said last mentioned means to the line circuit to convey the sounds and to disconnect said means after the sounds have been transmitted.

4. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a chute for receiving a coin, visual means at the central station for indicating the deposit of a coin, a signaling device at the substation actuated by coins passing through said chute and emitting sounds to indicate the coin has been deposited, means for transmitting such sounds to the central station over the line circuit and for operating said visual means, and switching means actuated upon the deposit of a coin for connecting said last mentioned means to the line circuit and for disconnecting said means after the sounds have been transmitted.

5. In combination a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, visual means at the central station to indicate the deposit of a coin, signaling mechanism in the collecting device for transmitting an audible tone to the central station to denote the denomination of the coin deposited and for operating said visual means, and coin actuated levers extending into said chutes for connecting the signaling mechanism to the line circuit to transmit said tone and to disconnect said signaling mechanism after the tone has been transmitted, said visual means being extinguished upon the disconnection of said signaling mechanism.

6. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, levers extending into said chutes actuated by the deposit of a coin, and means for arresting the progress in the chutes of additional coins until said levers have assumed their normal position.

7. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, signaling means actuated by coins passing through said chutes and emitting sounds in accordance with the denomination of coin deposited, transmitting means for conveying such sounds to the central station over the line circuit, levers extending into said chutes and actuated by the deposit of a coin, switching means controlled by the actuation of said levers for connecting the transmitting means to the line circuit and for disconnecting said means after the sounds have been transmitted, and means for arresting the progress in the chutes of additional coins until said levers have assumed their normal positions.

8. In combination, a telephone line circuit extending between a substation and a central station, a substation transmitter adapted to be connected with the line circuit, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, signaling mechanism in the collecting device to denote the denomination of coin deposited, an auxiliary transmitter mechanically connected to the signaling mechanism for conveying coin sounds, coin actuated levers extending into said chutes for connecting the auxiliary transmitter with the line circuit to transmit said sounds and to disconnect said auxiliary transmitter after the sounds have been transmitted, and switching means for disconnecting the substation transmitter during the interval the sounds are being transmitted.

9. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having a plurality of chutes for receiving coins of different denomination, signaling mechanism actuated by coins passing through said chutes and emitting sounds in accordance with the denomination of coin deposited, a transmitter mechanically connected with the signaling mechanism for transmitting such sounds to the central station over the line circuit, and coin actuated levers extending into the upper portion and lower portion of said chutes and sequentially operable to connect said transmitter to the line circuit to convey the sounds and to disconnect said transmitter after the sounds have been conveyed.

10. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having chutes through which coins travel, signaling mechanism in the coin collecting device for emitting sounds in accordance with the denomination

of the coin passing through the chutes, a transmitting element mechanically connected to the signaling mechanism for conveying such sounds to the central station, levers extending into said chutes at different levels and sequentially operated by the coin in its passage through the chutes, and visual means at the central station responsive to the actuation of said levers, the sequential operation of said levers providing such time interval as to insure the connection and disconnection of said visual means.

11. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having chutes through which coins travel, signaling mechanism in the coin collecting device for emitting sounds in accordance with the denomination of the coin passing through the chutes, a transmitting element mechanically connected to the signaling mechanism for conveying such sounds to the central station, levers extending into said chutes at different levels and sequentially operated by the coin in its passage through the chutes, and electromechanical means at the central station responsive to the actuation of said levers, the sequential operation of said levers providing such time interval as to insure the connection and disconnection of said electromechanical means.

12. In combination, a telephone line circuit extending between a substation and a central station, a coin collecting device at the substation having chutes through which coins travel, signaling mechanism in the coin collecting device for emitting sounds in accordance with the denomination of the coin passing through the chutes, a transmitting element for conveying such sounds to the central station, levers extending into said chutes at different levels and sequentially operated by the coin in its passage through the chutes, and electromechanical means at the central station responsive to the actuation of said levers, the sequential operation of said levers providing such time interval as to insure the connection and disconnection of said electromechanical means and means for arresting the progress in the chutes of additional coins until said levers have assumed their normal positions.

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