

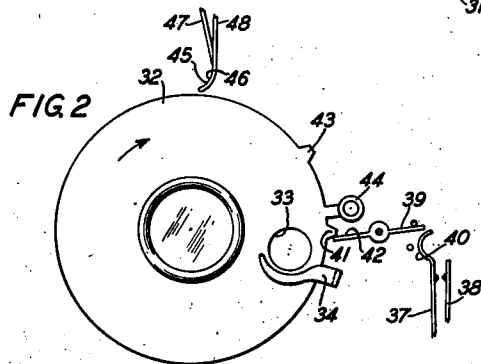
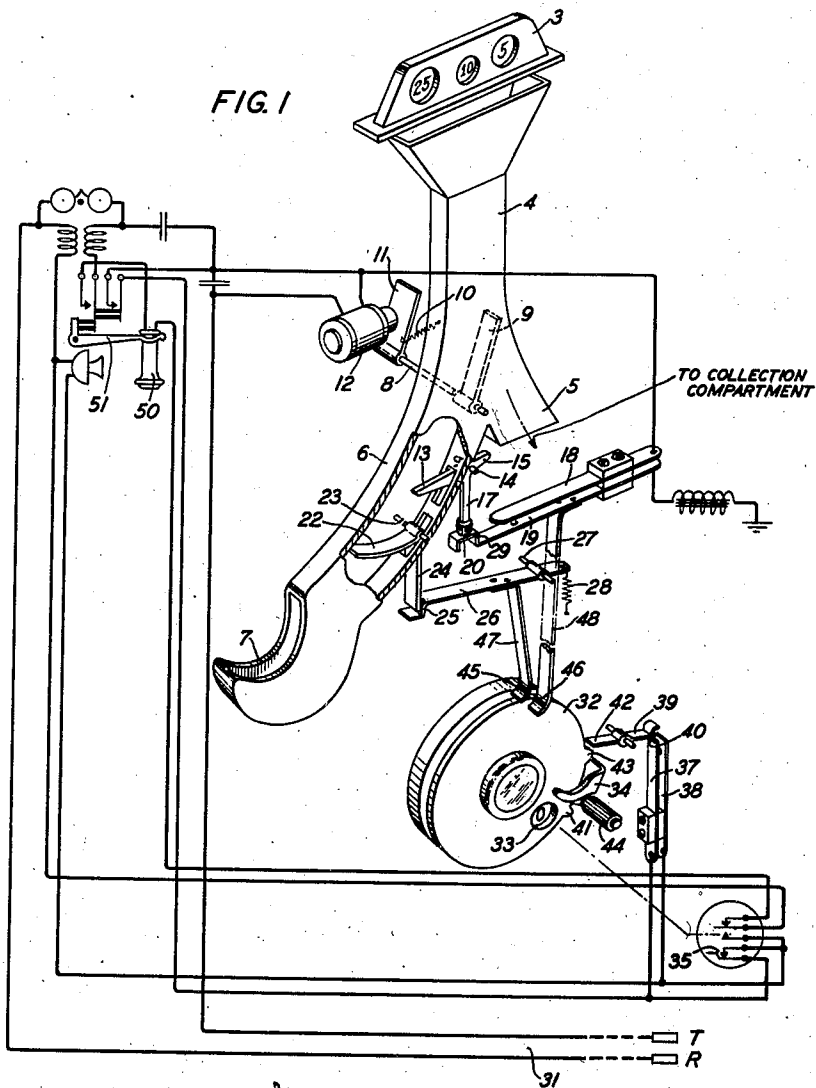
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TELEPHONE COIN COLLECTOR

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TELEPHONE COIN COLLECTOR

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This invention relates to telephone coin collectors particularly collectors adapted for connection to central offices not equipped to handle calls from a coin box station on the prepay basis.

Two types of telephone coin collectors are in common use at present for connection to small dial offices where the cost of prepayment service is not warranted. One type may be termed dial postpayment service where the customer is instructed to dial without first depositing a coin; and coin deposit is made after answer of the called subscriber or upon instructions from an operator. The other type may be termed manual postpayment service in which there is no dial at the substation; the customer, on removing his receiver and without depositing a coin, is automatically connected to the master office operator who completes the call and instructs him when to deposit money. Both types have the disadvantage that users accustomed to prepayment service occasionally deposit a coin when initiating a call, which coin although ineffective is automatically collected.

The object of the present invention is to provide a collector which avoids this service difficulty but which does not require at the central office that additional equipment which is necessary for full prepayment operation from coin box stations.

Further objects are to permit connecting coin collectors to the same central office switches as are provided to serve regular dial telephones, without necessitating separate switches or lines to the operator; and to prevent fraudulent manipulation of the dial at the coin box station to obtain unauthorized calls.

In accordance with the preferred form of the invention the coin collector substation apparatus is so arranged that the customer may initiate the call as with prepayment service by removing the receiver and depositing a coin. The calling dial associated with the collector has only a single finger-hole marked "Operator." On hearing the dial tone the customer will operate the dial to signal the operator and this operation of the dial causes the initially deposited coin to be returned. Due to this initial coin deposit and the removal of the receiver from the switch-hook, the central office equipment responds in the same manner as for a dialed operator call from a non-collector station and applies talking battery to the line. The presence of talking battery on the line operates an electromagnet to move a deflecting vane in the collector to an advanced position whereby all subsequently deposited coins will be

diverted directly into a collection receptacle. The central office operator in response to the operation of the dial will complete the call to the called party and will request coin deposit and hear the gong signals in the usual manner.

Referring to the drawing,

Fig. 1 is a diagrammatic illustration of a coin collector substation embodying the present invention; and

Fig. 2 is an enlarged view of the calling dial employed as a part of the apparatus of Fig. 1.

For simplification purposes only the essential parts of the coin collector substation apparatus are disclosed in Fig. 1, it being assumed that the disclosed collection apparatus may be enclosed in a housing of the general type disclosed in the O. F. Forsberg U. S. Patent 1,043,219 with the housing including the usual coin signals and cash compartment.

The usual coin collector of the Forsberg type has a coin gauge 3 mounted on the upper housing for receiving the deposited coins and directing them into a multiple coin chute where the coins selectively actuate suitable sound signals such as gongs or bells, after which the coins drop into a coin hopper for immediate or subsequent disposal depending upon the type of service for which the collector is designed. For simplification purposes the usual multiple coin chute and associated coin signals are omitted from the showing in Fig. 1 and the coins from the coin gauge 3 are shown as dropping directly into a coin hopper 4 which is branched at its lower end into a collect channel 5 leading directly to the collection box of the collector and a refund channel 6 leading to a refund slot 7 accessible to the customer.

Pivoted about a pin 8 and located within the hopper 4 is a vane 9 biased by a spring 10 to the position shown in Fig. 1 where the vane is effective to deflect the initially deposited coin away from collect channel 5 and into refund channel 6. Also mounted on pin 8 external to the hopper is the armature 11 of an electromagnet 12 which is adapted when energized to advance vane 9 to a position for deflecting subsequently deposited coins into channel 5 leading to the cash box.

Refund channel 6 below vane 9 contains a coin trigger 13 pivoted about a pin 14 and biased by a counterweight 15 to a normal position as shown in Fig. 1. Associated with the downwardly extending arm 17 of trigger 13 is a pair of electrical spring contacts 18, 19 biased to closed position but normally maintained open by the engagement

of trigger arm 17 with projection 20 on the outer end of the lower spring 19. Below trigger 13 in refund channel 6 is a coin trap 22 pivoted about a pin 23; and trap 22 is normally maintained in coin supporting position by the engagement of its extension 24 against a shoulder 25 formed near one end of an arm 26 rotatable about a pin 27 and biased by a spring 28 to the position shown in Fig. 1.

The apparatus of Fig. 1 is designed to require the initial deposit of a coin before the central office equipment will be prepared to extend the calling line to an operator's position. Such an initially deposited coin will be deflected by vane 9 into refund channel 6 to actuate coin trigger 13 and come to rest on trap 22. The coin actuation of trigger 13 will serve to move it counter-clockwise from its position of Fig. 1 to free spring projection 20 from the restraining action of trigger arm 17, thereby permitting spring contacts 18, 19 to close, while trigger 13 is maintained in its advanced position by reason of the fact that shoulder 29 is now lying in the return path of the lower end of arm 17. The closure of contacts 18, 19 connects ground through winding of electromagnet 12 to one side of line 31 to actuate apparatus at the central office to apply dial tone to the calling line and to supply energizing current to electromagnet 12 whereby the electromagnet will thereafter be maintained operated independently of the condition of contacts 18, 19, due to the connection of talking battery to line 31. The operation of electromagnet 12 as previously described serves to move vane 9 to an advanced position whereby subsequently deposited coins are prevented from entering the refund channel 6 and are directed instead into collect channel 5 leading to the cash box. It may also be assumed that the initially deposited coin in closing contacts 18, 19 has prepared the central office equipment to properly receive signaling impulses from the calling dial associated with the collector substation. As shown in the drawing, the finger-wheel 32 of the calling dial has only one aperture 33 corresponding to the "zero" or "operator" position on the usual dial and the presence of only one aperture in the finger-wheel limits the use of the dial solely for the purpose of signaling the operator. When the customer by means of aperture 33 rotates the dial clockwise until the finger-stop 34 is reached, it may, therefore, be assumed that the return movement of the finger-wheel 32 will transmit ten impulses to the central office as is the customary practice in obtaining connection to an operator.

It will be noted that the pulsing contacts 35 of the calling dial are normally short-circuited by spring contacts 37, 38. These contacts 37, 38 are biased to open position but are normally maintained closed by a pivoted latch 39 engaging the curved portion 40 of spring 37. However, finger-wheel 32 carries a cam 41 which, just before aperture 33 has reached its fully advanced position immediately above stop 34, will engage the free end 42 of latch 39 to move the latch counter-clockwise to the position shown in Fig. 2. This opens contacts 37, 38 to remove the short circuit across the dial pulsing contacts 35 so that the signaling impulses produced in the customary manner by the restoring movement of finger-wheel 32 to normal will be properly transmitted to the central office. Immediately prior to finger-wheel 32 reaching its normal position, cam 43 engages latch 39 in its advanced position

of Fig. 2 and restores it to normal position of Fig. 1 whereby contacts 37, 38 are again closed.

The operation of finger-wheel 32 in the above-described manner also serves to refund the initial coin and reopen contacts 18, 19. Finger-wheel 32 carries a roller type cam 44 which in the forward rotation of the finger-wheel engages the curved projections 45, 46 of latch springs 47, 48. The upper end of latch spring 47 is fastened to arm 26 whereby the engagement of cam 44 with the lower end of spring 47 serves to move downwardly end 25 of arm 26 to release trap 22 and permit the initially deposited coin to reach the refund slot 7. After the forward passage of roller 44 and the release of the coin, the trap 22 and arm 26 assume their normal positions of Fig. 1. Similarly the upper end of spring 49 is attached to spring contact 19 whereby the forward passage of roller 44 moves spring end 20 downwardly an amount sufficient to permit trigger 13 to restore to its normal position of Fig. 1 under the influence of its counterweight 15 whereby with the release of spring 46 from roller 44, spring 19 will be held out of engagement with spring 18 because the roller end of trigger arm 17 is now in its spring restraining position of Fig. 1. As previously stated, electromagnet 12 is maintained operated as long as talking battery is connected to line 31 so that the electromagnet is not deenergized by the above-described opening of contacts 18, 19.

As previously stated, it may be assumed that the return of finger-wheel 32 from its maximum advance position will serve to signal the operator; and the operator on answering will complete the call as with regular manual postpay operation, will request the proper coin deposit and will hear the gong signals indicating the nature and amount of the coins deposited. All coins deposited at the request of the operator will be directed immediately into the cash box due to the fact that vane 9 is maintained in its advanced position as long as talking battery is applied to line 31.

When the customer has replaced his receiver 50 on the receiver hook 51 the switches at the central office will release, removing battery from line 31 thereby deenergizing electromagnet 12 to permit vane 9 to be restored by biasing spring 10 to its normal position of Fig. 1.

It will be noted that the relative locations of cams 41 and 43 on finger-wheel 32 are such that the short circuit for the dial pulsing contacts 35 is removed only when wheel 32 has been substantially fully advanced; while in the return movement of the wheel the short circuit is not restored until just before the wheel has reached its normal position. Therefore, the partial rotation of finger-wheel 32 from its normal position to any of the positions corresponding to the digits 1 to 9, inclusive, on the usual calling dial will be of no avail because no pulses corresponding to such digits can be transmitted since for such partial rotations the short circuit around the pulsing contacts will remain closed. It, therefore, follows that a calling dial of the type disclosed is limited in its use to calling the operator and cannot be fraudulently used to dial the number of any subscriber.

What is claimed is:

1. In a telephone coin collector, a coin chute, a coin trap in said chute, a calling dial adjacent said chute for operation by the subscriber, and means actuated by the movement of said dial for operating said trap.

2. In a telephone coin collector, a refund chute, means for directing an initially deposited coin into said chute, a coin trap in said chute, means for normally holding said trap in coin supporting position, a calling dial adjacent said chute for operation by the subscriber, and means actuated by the movement of said dial for releasing said trap from said holding means.

3. In a telephone coin collector, a coin chute, a coin trap in said chute, a calling dial having a rotatable finger-wheel adjacent said chute for operation by the subscriber, means for normally holding said trap in coin supporting position, and means actuated by the rotation of said wheel for releasing said trap from said holding means.

4. In a telephone coin collector, a coin chute, a coin trap in said chute, a rotatable calling dial adjacent said chute for operation by the subscriber, means for normally holding said trap in coin supporting position, and means carried by said dial effective after said dial has been advanced a substantial distance from its normal position for actuating said holding means to release said trap.

5. In a telephone coin collector, a collect chute, a refund chute, pivoted means normally biased to a position for directing a deposited coin into said refund chute, a coin trap in said refund chute normally occupying a coin obstructing position, a calling dial, means controlled by the operation of said dial for moving said trap to a coin discharging position, a coin trigger in said refund chute above said trap, and means controlled by said trigger for moving said pivoted means to a position directing coins into said collect chute.

6. In a telephone coin collector, a collect chute, a refund chute, pivoted means normally biased to a position for directing an initially deposited coin into said refund chute, a coin trap in said refund chute biased to coin releasing position, means for normally holding said trap in coin supporting position, a calling dial, means controlled by the operation of said dial for releasing said trap from said holding means, an electromagnet, a normally open energizing circuit for said elec-

tromagnet, a coin trigger in said refund chute above said trap, means actuated by said trigger for closing said circuit, and means controlled by said electromagnet for moving said pivoted means to a position directing subsequently deposited coins into said collect chute.

7. In a telephone coin collector, a collect chute, a refund chute, pivoted means normally biased to a position for directing a deposited coin into said refund chute, a coin trap in said refund chute normally occupying a coin obstructing position, manually operated means for releasing said coin trap, and means controlled by a coin traversing said refund chute for operating said pivoted means to direct deposited coins into said collect chute.

8. A telephone substation comprising a collect chute, a refund chute, deflecting means for normally directing a first deposited coin into said refund chute, a coin trap in said refund chute, a coin trigger in said refund chute above said trap for operation by a deposited coin, electrical contacts controlled by said trigger and adapted to be closed by the coin actuation of said trigger, an electromagnet having a winding in circuit with said contacts, a calling dial having a rotatable finger-wheel, means carried by said wheel effective upon rotation of said wheel for releasing said trap and restoring said trigger to normal, and means controlled by said electromagnet for moving said deflecting means to a position directing coins into said collect chute.

9. In a coin collector, a collect chute, a refund chute, deflecting means for directing a first deposited coin into said refund chute, a pair of normally open electrical contacts, a coin trigger in said refund chute operated by a deposited coin for closing said contacts, an electromagnet having a winding in circuit with said contacts, means controlled by said electromagnet for moving said deflecting means to a position directing coins into said collect chute, a calling dial having a rotatable finger-wheel, and means carried by said wheel effective upon rotation of said wheel for reopening said contacts.

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