

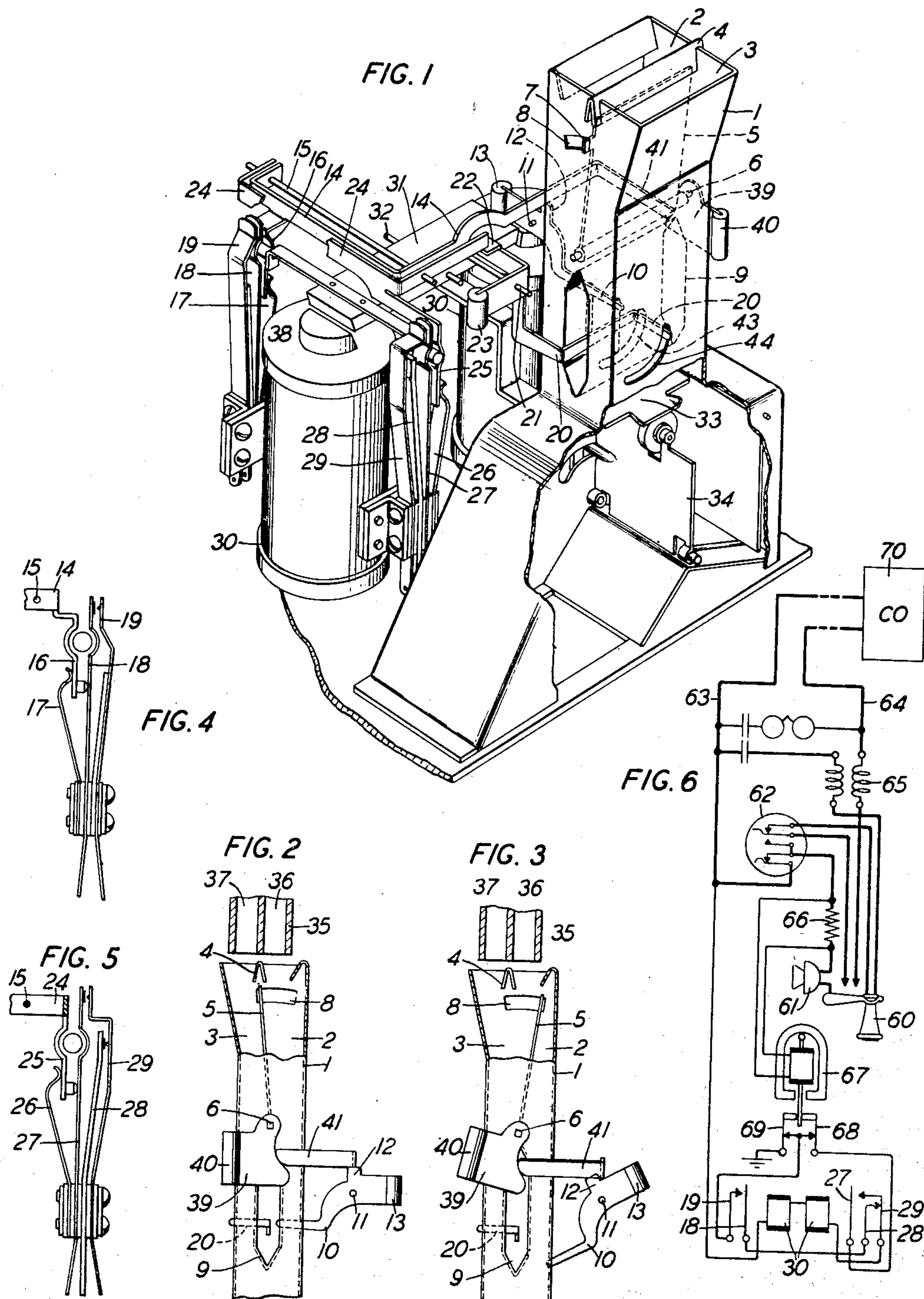
Nov. 14, 1933.

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1,934,679

COIN CONTROLLED DEVICE

Filed Jan. 15, 1931



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UNITED STATES PATENT OFFICE

1,934,679

COIN CONTROLLED DEVICE

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Application January 15, 1931. Serial No. 508,981

10 Claims. (Cl. 194—16)

This invention relates to check-controlled apparatus and particularly to coin-controlled devices for telephone substations.

The objects are to enable the operation of a coin box by the deposit of the proper sum in coins or tokens whether of one or more denominations, to enable the performance of a test to determine the amount deposited, and to otherwise improve apparatus of this character.

In coin-controlled telephone systems now generally in use it is the practice to determine the amount of money which the calling party has deposited by sending signals, usually audible, to the central office to apprise an operator of the number of coins deposited and the denomination of each coin. It is also old to send impulses of current from the substation to establish a record at the central office which may be interpreted by an operator to determine the amount of money deposited.

According to the present invention, the substation coin mechanism is so constructed that tests may be made from the central office without the assistance of an operator to determine the amount of any one of a plurality of sums that may have been deposited by the calling party. This is accomplished by means of a device having two coin-operated contacts, one for calls of one value, such as five-cent calls, and another for calls of another value, such as ten-cent calls. These contacts are so arranged with respect to the other parts of the device that when a five-cent piece is deposited it causes the closure of the five-cent contacts, and when a ten-cent piece is deposited it causes the closure of the ten-cent coin contacts. Should, however, the calling party deposit two five-cent pieces in order to make a ten-cent call, the second piece so deposited will cause the closure of the ten-cent coin contact. Thus a ten-cent call may be made either with a single ten-cent piece or with two five-cent pieces.

In the drawing accompanying this specification, Fig. 1 is a perspective view showing the essential parts of a coin-controlled mechanism involving the features of this invention. Figs. 2, 3, 4, and 5 are details of the structure shown in Fig. 1. Fig. 6 is a circuit diagram illustrating the application of the coin mechanism to a telephone line.

The present invention is particularly applicable to automatic telephone systems in which it is desirable for the calling party at a coin station to obtain calls into both five-cent and ten-cent zones by the use of the impulse dial and without any assistance on the part of the central office opera-

tor. In order to determine whether the calling party has deposited a coin, and if so, whether it is of a denomination sufficient to entitle him to obtain the connection for which he has dialed, the central office is equipped with registering mechanism for registering the designation of the called line in response to the impulses transmitted by the calling party and also with testing devices for making a test of the calling line and for comparing the results of the test with the registered designation.

An automatic telephone system of the general character referred to is illustrated in the Henry Patent No. 1,575,336 of March 2, 1926, in the Kopp Patent No. 1,589,402 of June 22, 1926, and in the Stearn et al. Patent No. 1,395,977 of November 1, 1921. More specifically, a system employing a central office testing arrangement suitable for cooperation with a coin mechanism of the type disclosed herein is shown and described in the copending application of H. M. Bascom, Serial No. 508,980 filed January 15, 1931.

The coin-operated mechanism disclosed herein is in general, of the same type as those shown in the patents to Forsberg No. 1,043,219 of November 5, 1912 and No. 1,117,485 of November 17, 1914.

Since a calling party is permitted to make calls into two different zones, such as a five-cent zone and a ten-cent zone, without the assistance of an operator, it becomes desirable to so arrange the coin mechanism that the testing equipment will be able not only to distinguish between a five-cent coin and a ten-cent coin, but will also be able to recognize the deposit of two five-cent pieces in payment for a ten-cent call. This is accomplished by the structure showing in the drawing which will now be described in detail.

This device comprises a coin receptacle or hopper 1 divided into two compartments 2 and 3 by means of a stationary guide 4, a movable deflecting vane 5, and a hollow partition member 9. The deflecting vane 5 is rotatably supported on the rod 6 and is provided with an ear 7 which projects through an arcuate slot 8 in one side of the receptacle 1. With the vane 5 in its normal position, as shown in Figs. 1 and 2, the upper edge of said vane lies directly beneath the stationary guide 4.

The deposited coins are conducted by a coin chute 35 to the opening of the receptacle 1. The chute 35 has two runways 36 and 37. Five-cent coins descend the runway 36 and, with the vane 5 in its normal position, enter the compartment 2 of the receptacle 1 and pass downwardly on the

right-hand side of the partition 9 as seen in Fig. 2, landing on the trap 33. Ten-cent coins descend the runway 37 and enter the compartment 3 of receptacle 1 passing downward on the left-hand side of the partition 9 and come to rest on the trap 33. The coins thus deposited rest on the trap 33 until subsequently collected or refunded.

Extending into the compartment 2 of the hopper 1 is a trip finger 10 pivoted on the rod 11. The tip end of the finger 10 extends through a vertical slot in the side of the compartment 1 and also through a vertical slot in the partition 9. These slots serve to fix and guide the finger as it rotates about the pivot 11. A weight 13 is secured to the opposite end of the finger 10 and serves to hold the finger in its normal position. The contact operating lever 14, which is rotatably mounted on the rod 15, normally rests on the upper surface of a shoulder 12 on the trip finger 10. In this position of the lever 14 the contact arm, although urged by the spring 17, is maintained in the position shown in Fig. 4 to permit the coin contacts 18 and 19 to assume their open condition.

The free end 41 of the lever 14 is turned through a right angle as seen in Fig. 1 and extends to a position where it engages the surface of the cam 39, more clearly seen in Figs. 2 and 3. The cam 39 is securely fixed to the pivot rod 6 such that any movement of said cam about the axis is accompanied by a tilting of the deflecting vane 5. A weighted portion 40 serves to hold the cam 39 and vane 5 in the normal position shown in Fig. 2.

When a five-cent piece descends through the runway 36 and enters the compartment 2, with the vane 5 in its normal position, it strikes the trip finger 10, rotating it to the point where the shoulder 12 slides out from under the contact lever 14. When this occurs, the spring 17 rotates the lever 14 and the contact operating arm 16 moves the contact spring 18 into engagement with the contact spring 19. The closure of contacts 18 and 19 is an indication that a five-cent coin has been deposited. As the extension 41 of the contact lever 14 rotates, it tilts the cam 39 and shifts the vane 5 from its normal to its deflected position as seen in Fig. 3. The purpose of this will be explained hereinafter.

Within the other compartment 3 of the coin hopper 1 is a second trip finger 20. The trip finger 20 is pivoted on the rod 21, and the free end thereof extends into the hollow partition 9 and thence through opposite arcuate slots 43 and 44, one of which is cut in the side of the partition 9 and the other in the wall of the hopper 1. These slots serve to guide the trip finger 20 as it rotates about its axis. The trip finger is provided with a weight 23 which normally holds it in the position shown in Figs. 1 and 2. A second contact operating lever 24, also pivoted on the rod 15, has an extension which normally rests on a shoulder 22 of the trip finger 20. With the lever 24 held in this position, the contact operating arm 25, although urged by the spring 26, is maintained in the position shown in Fig. 5 with contacts 27 and 29 open and contacts 28 and 29 closed.

A ten-cent piece when deposited in the device descends the runway 37 and enters the compartment 3 of the hopper 1. As it falls through the compartment 3, it strikes the trip finger 20, rotating the same about its pivot and releasing the lever 24. The lever 24 rotates, and the contact operating arm 25 moves the contact 27 into engagement with contact 29 and moves contact

29 out of engagement with contacts 28. The shifting of these contacts is an indication that a ten-cent piece has been deposited.

It may happen that the calling party desires to secure a ten-cent call by the use of two five-cent pieces instead of a single ten-cent piece. The deposit of the first five-cent piece operates to close the contacts 18 and 19 and to shift the deflecting vane 5 to its off-normal position as explained above. The second five-cent piece on descending the runway 36 enters the receptacle 1, but, instead of passing into the compartment 2 as did the first five-cent piece, it encounters the deflecting vane 5 which guides it into the ten-cent compartment 3. Therefore, the second five-cent piece instead of striking the trip finger 10, strikes the trip finger 20, causing it to operate the same as though a ten-cent piece had been deposited.

The deposited coins are disposed of in the usual manner by energizing the polarized magnets 30. The magnets 30 attract the armature 31 to rotate it in one direction or the other to release the trap 33. According to the manner in which the trap 33 is released, coins are either collected or refunded to the calling party. As the armature 31 rotates, the restoring lever 38 engages the arms 16 and 25 to restore the levers 14 and 24 to their normal or latched condition. As soon as lever 41 restores to its normal position, the cam 39 and deflecting vane 5 are returned to normal by the weight 40.

The diagram in Fig. 6 shows the circuit details of a telephone substation equipped with a coin box of this character. The circuit comprises the usual receiver 60, talking transmitter 61, induction coil 65 and impulse dial 62. The tip and ring conductors 63 and 64 extend from the substation to the central office 70. The substation is also equipped with a polarized relay 67 having two normally closed contacts 68 and 69. The winding of this relay is connected across a resistance 66 so that the impedance of the winding does not interfere with voice currents. The contact 69 is connected to ground so that with the relay 67 in its normal position, as shown, ground potential exists on the normally open five-cent contact 19 and on the normally open ten-cent contact 27. The deposit of a five-cent piece for the purpose of a five-cent call closes contacts 18 and 19 as already explained. If now test current is applied to the line 63, 64 from the central office 70 in such a direction as to move the armature of relay 67 to the right, contacts 68 are opened whereas contacts 69 remain closed. This maintains ground potential on the contact 19 and removes ground potential from the contact 27. Since contact 19 is now in engagement with contact 18, a five-cent piece having been deposited, the testing equipment at the central office will detect this ground and recognize it as an indication that a five-cent piece has been deposited.

The deposit of a ten-cent piece closes the contacts 27 and 29 and opens contacts 28 and 29 as above explained. If now test current is applied to the line 63, 64 in the opposite direction, polarized relay 67 moves its armature to the left and ground potential is removed from both contacts 19 and 27. By performing an additional test with relay 67 in its normal position, presence of ground potential through contacts 68, 27 and 29 will indicate that a ten-cent piece has been deposited.

In case two five-cent pieces are deposited for a ten-cent call, contacts 18 and 19 are closed by

the first five-cent piece and contacts 27 and 29 are closed and contacts 28 and 29 are opened by the second five-cent piece as described. Although contacts 18 and 19 are closed, they are
5 disconnected from the line by the open contacts 28 and 29, thus giving the same condition as though a ten-cent piece has been deposited.

What is claimed is:

1. The combination in a coin controlled device
10 of a coin chute, a set of circuit contacts, means for operating said circuit contacts in response to the deposit of a coin of a particular denomination in said chute, a second coin chute, a second
15 set of circuit contacts, means for operating said second set of circuit contacts in response to the deposit of a coin of a second denomination in said second chute, and means responsive to the
20 deposit of a coin of said first mentioned denomination in said first chute for rendering said second set of circuit contacts operable by a coin of said first mentioned denomination.

2. In a coin mechanism, a coin receptacle, a pair of chutes for leading coins of two different denominations to the entrance of said receptacle,
25 a guide for directing coins of one denomination to one portion of said receptacle and coins of the other denomination through another portion of said receptacle, and means for moving said
30 guide to cause coins of said second denomination to pass through said first mentioned portion of said receptacle.

3. In a coin device, a hopper having two compartments, means for directing coins of two different denominations to the entrance of said
35 hopper, a guide for directing coins of one denomination into one of said compartments and coins of the other denomination into the other of said compartments, means in said compartments actuated by the passage of said coins therethrough,
40 and means for moving said guide to cause a coin of said second mentioned denomination to pass into said first mentioned compartment.

4. In a coin mechanism, a coin hopper having two compartments, a pair of chutes, one for leading
45 coins of one denomination and the other for leading coins of a second denomination to the entrance of said hopper, a movable vane for directing coins of the first denomination into one compartment and for directing coins of the second
50 denomination into the second compartment of said hopper, a lever in said first compartment actuated by the passage of a coin therethrough, a lever in the second compartment actuated by the passage of a coin therethrough, and means
55 controlled by the passage through said second compartment of a coin of said second denomination for moving said vane to cause a subsequently deposited coin of said second denomination to pass through said first compartment.

5. In a telephone system, a connection to
60 ground a circuit having two separate paths, and a coin controlled mechanism associated therewith comprising means for receiving the deposit of a single coin of one denomination to connect
65 one path of said circuit to ground, and means for receiving the deposit of a single coin of another denomination for connecting the other path of said circuit to ground and for receiving a second coin of said other denomination for
70 connecting the first-mentioned path of said circuit to ground.

6. The combination in a coin controlled device of a coin chute, a set of contacts operated in response to the deposit of a coin of a particular denomination in said chute, a second chute, a
80 second set of contacts operable in response to the deposit of any coin of a second denomination in said second chute, and means operated by the deposit of said coin of a particular first denomination in the first chute for preventing the succeeding coin of said particular first denomination
85 deposited in said first chute from operating the said first set of contacts and for causing such succeeding coin of said particular first denomination if deposited in said first chute to operate said second set of contacts instead. 90

7. The combination in a coin control device of a receptacle for deposited coins, a ground connection, two sets of circuit controlling contacts representing deposited sums of different values, means for operating one set of said contacts by a single deposited coin of a particular denomination to close a connection to ground,
95 and means operative by a single deposited coin of a second denomination to close a different connection to ground through the other of said sets of contacts or by a number of deposited coins
100 of said first denomination to first close the connection to ground through said first mentioned set of said contacts and then to open this connection to ground and to close said other connection to ground through said second set of contacts. 105

8. The combination in a coin control device of a receptacle for deposited coins, a ground connection, three sets of circuit controlling contacts, one set of contacts representing one deposited coin, of a certain denomination, and the other two representing a deposited coin of a different denomination or two coins of the first mentioned denomination, means for connecting
110 the first set of contacts to ground by the single deposited coin, and means for operating the other two sets of contacts to ground either by a single deposited coin of said other denomination or by a number of deposited coins of said first mentioned denomination to establish a different connection to ground. 115

9. In a coin mechanism, a coin receptacle, a pair of chutes for leading coins of two different denominations to said receptacle, a guide for directing coins of one denomination to one portion of said receptacle and coins of the other denomination to another portion of said receptacle, a coin operated means for moving said
125 guide to cause coins of said second denomination to pass through said first-mentioned portion of said receptacle. 130

10. In a coin device, a hopper having two compartments, means for directing coins of two different denominations to the entrance of said
135 hopper, a guide for directing coins of one denomination into one of said compartments, and coins of the other denomination into the other of said compartments, means in the first-mentioned compartment actuated by the passage of coins thereto, and means in the other compartment actuated by the passage of a coin thereto for moving said guide to cause a coin of said second denomination to pass into said first-mentioned compartment. 140

ALLEN R. BONORDEN. 145