June 19, 1934. V. T. COMER 1,963,402

ELECTRICAL COIN TESTER AND EJECTOR

Filed Feb. 9, 1931 2 Sheets-Sheet 1

Fig. 1.

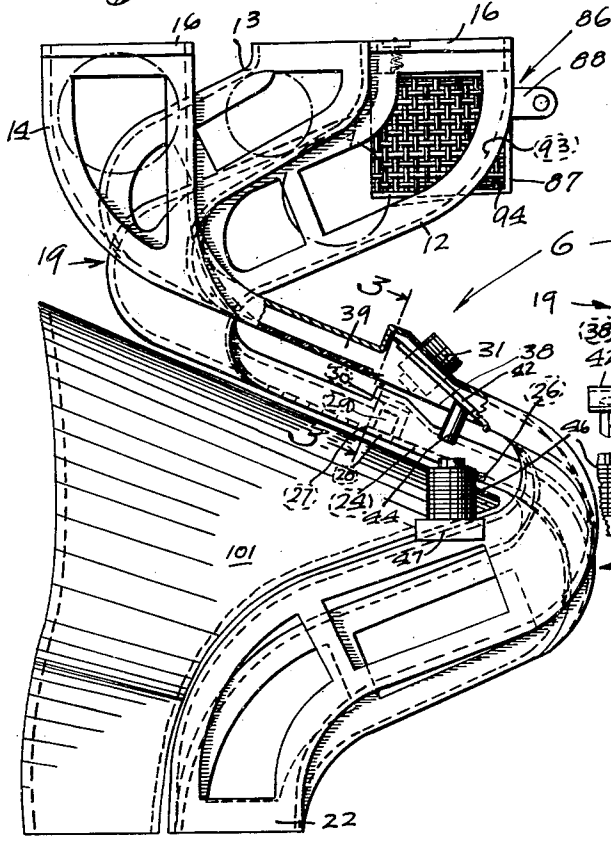


Fig. 2.

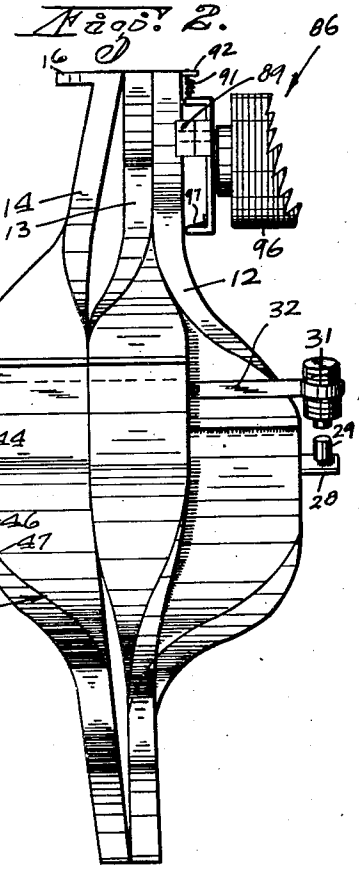


Fig. 3.

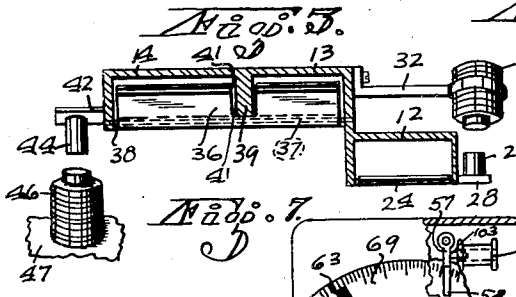


Fig. 4.

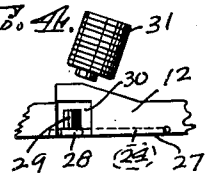


Fig. 5.

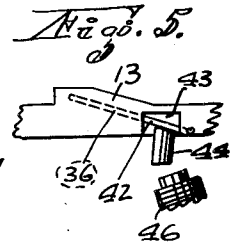


Fig. 7.

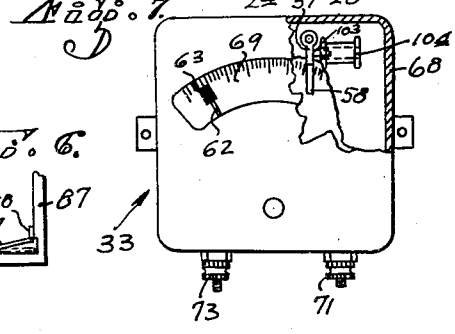
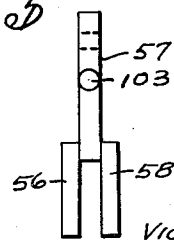


Fig. 6.



Fig. 8.



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Fig. 9.

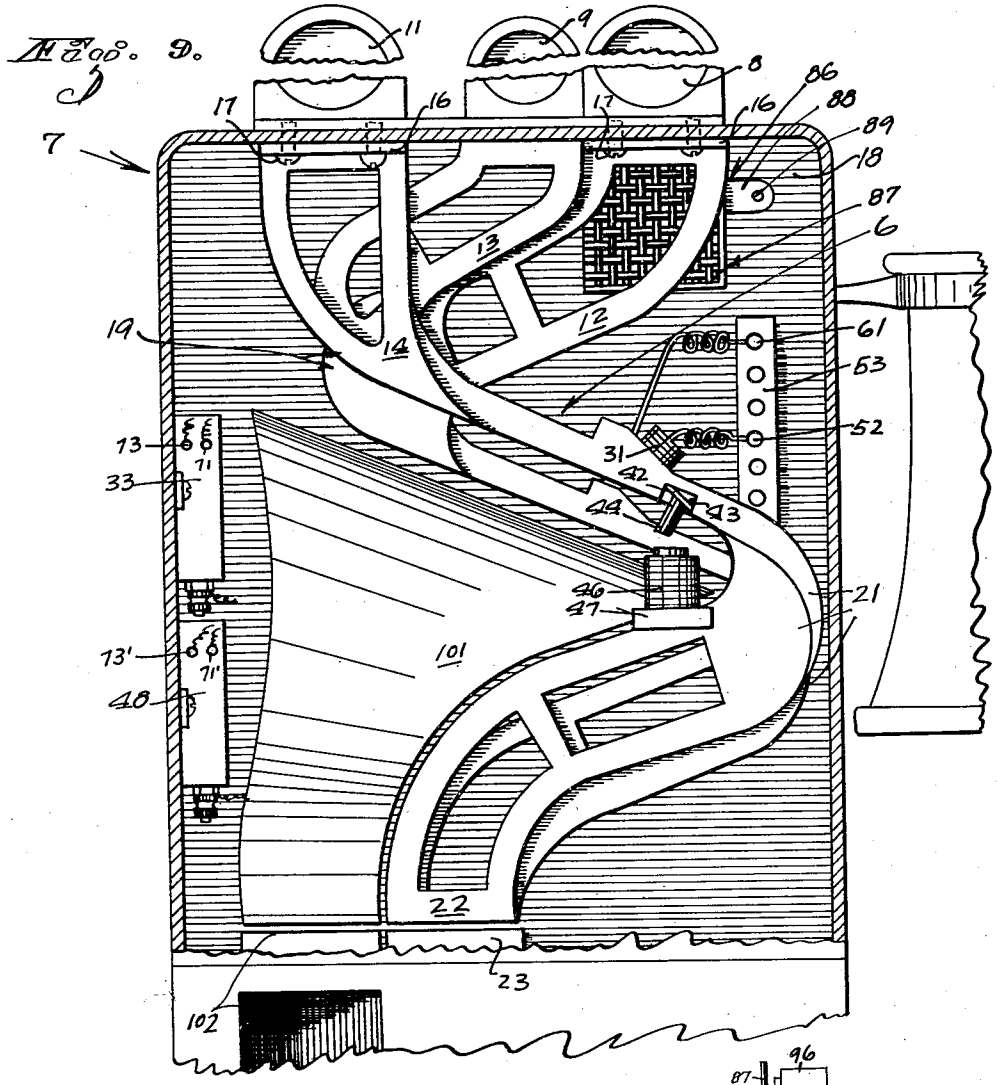
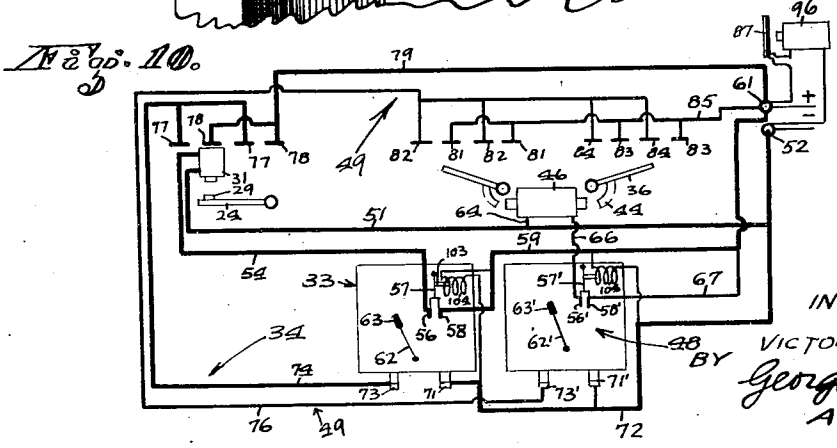


Fig. 10.



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Patented June 19, 1934

1,963,402

UNITED STATES PATENT OFFICE

1,963,402

ELECTRICAL COIN TESTER AND EJECTOR

Victor T. Comer, San Francisco, Calif., assignor of ten per cent to George B. White, San Francisco, Calif.

Application February 9, 1931, Serial No. 514,389

24 Claims. (Cl. 194—101)

This invention relates to a coin tester and ejector.

The primary object of the invention is to provide a safety device whereby the use of spurious coins in coin operated machines, such as coin operated dispensing devices, and telephone pay stations is obviated by reason of the ejection of the spurious coin before it can reach the operating mechanisms of the device.

This invention is particularly adapted for use in telephone pay stations, where the use of spurious coins, is the most common; by electrically testing each coin, and ejecting the spurious coins, from the chute of a telephone box, the unreliable sound-test heretofore employed can be entirely eliminated, and the use of spurious coins is positively prevented.

Other objects and advantages are the provision of an electric coin testing and selecting device which will be superior in point of simplicity, inexpensiveness of construction, positiveness of operation, and facility and convenience in use and general efficiency.

In this specification and the annexed drawings, the invention is illustrated in the form considered to be the best, but it is to be understood that the invention is not limited to such form, because it may be embodied in other forms; and it is also to be understood that in and by the claims following the description, it is desired to cover the invention in whatsoever form it may be embodied.

The invention is clearly illustrated in the accompanying drawings, wherein

Fig. 1 is a front view of a chute for the coins with the testing and ejecting mechanisms thereon constructed in accordance with my invention.

Fig. 2 is a side view of the chute and the related mechanisms thereon.

Fig. 3 is a sectional view of the chute, the section being taken on the line 3—3 of Figure 1.

Fig. 4 is fragmental, detail of the trap for the spurious nickels.

Fig. 5 is a fragmental, detail view of the trap for the dimes, and quarters.

Fig. 6 is fragmental view of tripping tray for nickels and the circuit breaker therein.

Fig. 7 is a detail view of the circuit breaker of my testing and ejecting circuit.

Fig. 8 is a detail view of the adjustable contacts of the circuit breaker of the testing and ejecting circuit.

Fig. 9 is a sectional view of the box of a telephone pay station with the instrumentalities of my device therein.

Fig. 10 is wiring diagram of the electrical connections of my device.

This method of testing coins and of ejecting the spurious coins, is based on the fact that the spurious coins found in pay telephones and other coin operated devices, are mostly made of a metal the degree of conductivity of which is between the conductivity of nickel and of silver. The only exceptions are spurious coins made of iron or steel, the conductivity of which is lower than that of nickel. Consequently for all the different kinds of spurious coins, except iron and steel coins, a testing circuit is provided, which circuit includes the coin itself, and which also includes a sensitive circuitbreaker, responsive to a current characteristic dependent on the conductivity, or resistivity of the entire circuit, so that the circuit breaker is operated only when the conductivity of the coin is above a predetermined degree. For instance in a device which operates on "nickels", the circuitbreaker becomes operative whenever a coin of a conductivity higher than that of "nickel" is connected in the circuit. When the device is operated by silver coins, such as "dimes" and "quarters" and the like, the circuitbreaker is so constructed that it becomes operative only when a coin of the conductivity of the silver coin is connected in the circuit. In the first instance every coin up to and including the conductivity of "nickel" is allowed to continue its travel to the operating mechanism of the machine, and all other coins cause the closing of the circuitbreaker and operate an ejector. In the second instance every coin the conductivity of which is below that of silver is automatically diverted from the operating part of the device and is ejected, but when silver is connected in the testing circuit the same closes the circuit breaker and operates a mechanism to direct the good silver coins through the operative path. The mechanism to direct the coin, in the present illustration, includes a chute, and traps in the chute suitably actuated by electromagnets, which latter are energized and de-energized by the closing and opening of the respective circuitbreakers.

Steel and iron coins, of course fall into the class of spurious coins, the conductivity of which is below that of silver, therefore in the chutes for silver coins, the steel and iron coins will be automatically ejected, because they will not cause the closing of the circuitbreaker. In chutes used for "nickels" it is necessary to provide a separate electromagnet to pull the steel and iron coins out of the chute, even before the same reach the trap, which latter they would not actuate.

Inasmuch as the actuating mechanism for these circuitbreakers is sensitive to changes of current, it is necessary to compensate these instruments for the usual changes of the main supply of operating current originating from the source of electricity, so that, for instance, the tester is accurate regardless of the natural fluctuations of the current characteristics of the telephone circuit proper. This is accomplished by a special circuitbreaker construction as shown.

In carrying out my invention I make use of a chute 6 which is disposed in the box 7 of a telephone pay station. There are three coin slots on the top of the box 7, namely a slot 8 for "nickels", another slot 9 for "dimes", and another slot 11 for "quarters". The chute 6, of course, is always constructed in such manner to fit the particular slots used on a device. In a telephone pay station the upper end of the chute 6 is divided in three channels 12, 13, and 14 respectively for nickels dimes and quarters. The channels 12, 13 and 14 are preferably united in a single structure and are secured to the underside of the top of the box 7 by suitable flanges 16 and screws 17. These screws 17 are also used to secure the brackets on which the slots 8, 9, and 11 are formed, to the top of the box 7 so that the respective slots and channels are in registry with each other.

The channels 12, 13, and 14 are flat, so as to guide the respective coins in rolling position. The upper portion of the chute has the channels 12, 13 and 14 formed parallel with the planes in which the slots 8, 9 and 11 lie, and also substantially parallel with the rear wall 18 of the box 7. The said channels 12, 13, and 14 converge toward a turn 19 of the chute 6, where all the channels are twisted so that the flat sides thereof are longitudinally inclined in planes substantially at right angles to the plane of the rear wall 18, of the box 7. The turn 19 is formed with such a curve as to gradually or progressively turn the coins from the edgewise, rolling position thereof, to positions face down on the lower, flat sides of the respective channels 12, 13 and 14. The coins are thus sliding in the channels to another gradual turn 21 of the chute 6, where all the channels are turned oppositely to the first turn 19 and are united in a single discharge block 22, in a plane parallel with the planes of the upper ends of the channels, so as to discharge the coins rolling into the collecting box inlet 23 of the telephone.

It is to be noted that the coins in the chute 6 move by gravity in the upper and lower extremities of the chute 6, the coins are guided to roll on their edges, but in the twisted chute portion, between the turns 19 and 21, the coins slide face down on the wider, flat walls of the respective channels. It is at this portion of their travel that the testing and selecting is performed.

In the twisted portion of the channel 12 is provided a trap gate 24, hinged at a transverse edge thereof on a spring hinge 26 which urges the trap 24 into closed position. The trap 24 is so formed as to complement the inner face of the bottom, flat side of the channel 12, when closed, thereby allowing coins to slide thereover to and beyond the turn 21, which constitutes the operative path of the coin. In order to direct a spurious coin into an inoperative path, the trap 24 is raised to open a gap 27 through which the coin drops out of the channel 12. It is to be noted that the trap 24 is hinged at its edge adjacent to the turn 21, and opens inwardly of the channel 12 to block the path of the coin in the said channel 12.

The trap 24 has a lug extension 28 protruding beyond the outer edge of the channel 12, which latter has an armature 29 extended upwardly therefrom. Above the armature 29 is an electromagnet 31 supported on a bracket 32 on the chute 6. Whenever the electromagnet 31 is energized it draws the armature 29 upwardly thereby opening the trap 24 so as to direct a coin out of the channel 12. The outer side of the channel 12 is slotted as at 30 to permit the movement of the extension 28 therein.

A circuit breaker 33, actuated by a tester circuit 34, controls the energization of the magnet 31. The tester circuit 34 is such as to include the coin tested and is operated in accordance with the conductivity of the coin. Normally the circuit breaker is open, therefore the trap 24 is normally closed.

In the twisted portions of the channels 13 and 14 is another trap gate 36. The twisted portions of the channels 13 and 14 are aligned, as shown in Figure 3, and the trap gate 36 extends across the width of the two adjacent channels to form a bottom common to both. The trap gate 36 is secured at its transverse edge adjacent the curve 21 to the channels 13 and 14 by means of a spring hinge 37, which latter is adapted to normally urge the gate 36 upwardly and inwardly of the channels 13 and 14, thereby to uncover the gaps 38, in the channels 13, and 14, and allow the dropping of the coins out of the respective channels, until the gate 36 is closed.

In order to allow the swinging of the gate 36 over and alongside of the partition wall 39, a longitudinal slot 41 is cut in the gate 36 extending from the free end of the gate to its hinge, and slidably fitting over the partition wall 39. Thus both wings of the trap gate 36 are simultaneously closed and opened.

An extension 42 protrudes from the outer edge of the gate 36 through an elongated slot 43 in the outside edge wall of the chute 14. On the extension 42 is an armature 44 in operative relation to an electromagnet 46, which latter is mounted on a platform 47, on the chute 6.

A circuit breaker 48, actuated by a tester circuit 49 controls the energization of the magnet 46. The tester circuit 49 includes branches connected in parallel, one for each channel 13 and 14, to complete an electric circuit through the coins passing toward the gate 36 in either one of the respective channels 13 and 14. The tester circuit 49 is adapted to operate in accordance with the conductivity of the coin through which the circuit is completed. The circuit breaker 48 is not actuated and not closed until a silver coin is connected in the tester circuit 49, therefore the trap gate 36 is normally held in open position to block the path of spurious coins, and direct the same to the gaps 38 out of the chute 6.

The circuitbreakers 33 and 48 operate in a similar manner, but respond to the electric currents at different adjustments.

The electric circuit of the magnet 31 includes a wire 51 connecting the electromagnet to a terminal 52 on a usual terminal post 53 of a telephone circuit. Another wire 54 connects the electromagnet to a spring contact 56 of a bifurcated contact member 57. The other, opposed spring contact 58 of the said member 57 is connected by a wire 59 to another terminal 61 on the post 53. The contacts 56 and 58 are spaced and insulated from each other, so that the circuit of the electromagnet 31 is normally open. To energize the magnet 31 a movable arm 62 is

swung to the member 57 so that a conductive metal tip 63 on the end of the nonconductive arm 62 is forced edgewise between the contacts 56 and 58 completing the electric circuit therethrough.

The circuit of the electromagnet 46 includes a wire 64 connected to the wire 51, or in parallel therewith to the terminal 52, and another wire 66 connected to a contact 56' of a bifurcated member 57'. The other contact 58', opposite to and spaced and insulated from the contact 56' is connected by wire 67 to the wire 59, or in parallel with the wire 59 to the terminal 61. A swinging insulated arm 62' is adapted to be brought in engagement with the member 57' so that the tip 63' of the former is forced edgewise between the contacts 56' and 58' to complete the energizing circuit of the magnet 46.

It is to be noted that in the wiring diagram in Fig. 10, the magnet 46 is shown with two armatures, one at each end, connected to two traps. This illustration is diagrammatic to clearly show that the magnet 46 operates two traps simultaneously. However in the structural embodiment of the invention, shown in the other figures, the two traps are united into the double gate 36.

For the purpose of illustration the circuitbreakers 33 and 48 are shown in the form of electric measuring instruments, so as to swing the arms 62 and 62' respectively in accordance with the current in the respective tester circuits 34 and 59. For instance a voltmeter or ammeter of the dial type may be utilized.

In Fig. 7 I show the circuitbreaker 33 embodied in the form of a voltmeter. Inasmuch as the circuitbreakers 33 and 48 are preferably constructed in the same manner, the description of one will suffice.

The voltmeter is of the usual construction, it includes a casing 68, adapted to be secured to a wall of the telephone box 7, as shown in Fig. 9. In the box is swingably supported the arm 62, which is the hand of the voltmeter, and is moved by the usual voltmeter coil and mechanism, not shown. The tip 63 of the arm 62 moves over an arcuate graduated dial 69, in accordance with the voltage in the tester circuit 34. The bifurcated contact member 57 is disposed at right angles to the plane of the dial 69, so that the gap between the contacts 56 and 58 thereof is in registry with the path of the tip 63.

Under a certain operating current, the arm 62 is caused to swing to a certain distance over the dial when a nickel is placed in the tester circuit 34. But whenever a metal of a conductivity higher than that of nickel is connected in the tester circuit 34, the voltage of the circuit is higher, and the arm 62 swings farther than when a nickel is in the circuit. The contact member 57 is disposed slightly beyond the graduation on the dial 69 corresponding to the voltage of the circuit when a good nickel is connected therein, so that the tip 63 does not reach the contacts 56 and 58 and the circuitbreaker remains open allowing the nickel to pass over the inoperative trap 24. But when a spurious coin other than steel or iron coins, is connected in the tester circuit 34 the arm 62 tends to swing beyond the point where the contacts 56 and 58 are located and forces the tip 63 between said contacts thereby it closes the circuitbreaker and causes the energizing of the electromagnet, and the opening of the trap 24 to eject the spurious coin.

The terminal 71 of the voltmeter circuitbreaker 33 is connected to the telephone terminal by a wire 72, and to the other voltmeter terminal 73 is connected a wire 74 forming part of the tester circuit 34.

The circuitbreaker 48 differs from the circuitbreaker 33 in that the contacts 56' and 58' are held on the dial at a point corresponding to the voltage of the dial 69 when a silver coin is in the tester circuit. Thus the arm 62' is never swung sufficiently far to close the circuitbreaker, when coins having a lower conductivity than that of a silver coin are connected in the tester circuit 49. Consequently the trap gate 36 remains open, until a silver coin is connected in the tester circuit 49.

The voltmeter terminal 71' is connected to the wire 72, or to the telephone terminal 52 in parallel with the wire 72, and to the other voltmeter terminal 73' is connected a wire 76 of the tester circuit 49.

The tester circuit 34 includes a plurality of spaced contact plates 77 and 78 embedded in the bottom wall of the twisted portion of the channel 12, immediately preceding the trap 24. The contact plates 77 and 78 are insulated from each other, and the plates 77 are connected to the wire 74, while the other plates 78 are connected by a wire 79 directly to the telephone terminal 61. The contact plates 77 and 78 are so disposed that the coins moving in the channel 24 slide thereover and bridge the contacts 77 and 78 thereby to connect the coins in series in the tester circuit 34. Thus the current flows from the terminal 52 through line 72, to the voltmeter coils of the circuitbreaker 33 then out through the terminal 73, and wire 74 to the contacts 77, and then through the coin, to the contacts 78, and line 79 to the telephone terminal 61, when a coin thus closes the tester circuit 34, the circuitbreaker 33 is actuated in the aforedescribed manner. The contacts 77 and 78 extend to a sufficient distance to hold the trap open, in the case of a spurious coin, until the coin reaches the opening 27 to be discharged from the channel 12. If necessary, for the proper timing, an automatic delay circuit interrupter may be connected in the tester circuits.

In the bottom of the channel 13 are embedded contacts plate 81 and 82, and in the bottom of the channel 14 are contact plates 83 and 84. The contact plates 81, 82, 83, and 84 are arranged similarly to the contact plates 77 and 78, immediately preceeding the respective wings of the trap gate 36. The contact plates 81 and 83 are connected in parallel, by a wire 85 to the telephone terminal 61. The other contact plates 82 and 84 are connected in parallel to the wire 76, so that the tester circuit 49 may be completed either through the contact plates 81 and 82, by a coin passing in the channel 13, or through the contact plates 83 and 84 passing through the channel 14. If the coins bridging these contacts have lesser conductivity than that of a silver coin then the arm 62' is not swung sufficiently far by the voltage of the tester circuit to close the circuitbreaker 48, consequently the trap gate 36 is left open and the spurious coin is dropped out of chute 6.

It is to be noted that if the arms 62 and 62' are the hands of instruments responsive to the amperes of the tester circuits 34 and 49 respectively, the result will be the same. Any instrument responsive to a characteristic of an electric current dependent on the conductivity, or resistivity of a section of said circuit, could be adapted to so move the circuit closing element of a cir-

cuitbreaker as to close the respective electromagnet circuits at the times heretofore set forth.

The operating and tester circuit may receive the electric current from any source of electricity. In this illustration either the terminals of the telephone speaking circuit, or the terminals of the refund circuit can be utilized. The voltmeters, and the dial setting, of course, as well as the position of the contact member 57 is to be predetermined by the voltage of the current supply. In this illustration the terminal 52 is of the 48V. refund circuit, the terminal 61 is the ground terminal of the same telephone circuit.

Steel and iron coins are removed at the upper upright portion of the channel 12 by the electromagnetic mechanism 86, which latter includes a flanged tray 87, an arm 88 of which is pivoted to an ear 89 on the chute 6. A coil spring 91 has an end thereof secured to another ear 92 on the chute 6, and the other end thereof attached to the uppermost flange of the tray 87 so as to counterbalance the weight of the tray 87 and hold the latter in an upright position, opposite an enlarged opening 93 in the adjacent side of the channel 12. The bottom 94 of the tray is made of insulating mesh wire or the like. Behind the bottom 94 of the tray 87 is a fixed electromagnet 96 constantly connected to the terminals 52 and 61. The magnet 96 is always energized and it attracts any steel or iron coin so as to pull the same out of the channel 12 through the opening 93 and into the flanged tray 87. The bottom 94 of the tray 87 is so constructed as to allow the action of the magnet 96 on the steel coins, but to prevent the drawing of the coin into contact with the magnet 96. The weight of the coin in the tray 87 depresses a light spring contact 97 on the lowest flange of the tray 87 so as to move the contact 97 out of engagement with a fixed contact 98. These contacts 97 and 98 are connected in series between the electromagnet 96 and the terminal 61, so that the magnet 96 is deenergized every time a coin is pulled into the tray 87. Then the weight of the coin overbalances the tray 87 and trips the same downwardly, against the action of the spring 91. The side of the tray 87 farthest from the arm 88 has no flange so that when the tray 87 is tripped the coin is permitted to roll off the tray. After the coin is dropped from the tray, the spring contact 97 returns to contacting position rendering the magnet 96 operative. Other circuitbreakers, and tripping mechanisms may be employed to operate on the principle herein set forth.

All the spurious coins discharged from the chute 6, at any of the aforedescribed points of ejection drop into the suitably flared end of a refund tray and chute 101, which is so formed as to extend below all the coin traps and ejectors. The chute 101 tapers downwardly and its lower end is opposite an inlet of the refund chamber and slot 102 of the telephone box, or of the coin operated machine in which my device is used.

Inasmuch as the electric current supply itself is subject to certain fluctuations of voltage, and amperage originating from the source of electricity itself, it is necessary for the accuracy of the device to provide means for compensating for such fluctuations and changes. Especially is such compensation required in connection with the circuitbreakers 33 and 48. Such compensation is accomplished by the floating support of the contact members 57 and 57' respectively. The compensating means for the circuitbreakers 33 and 48 are identical. A solenoid core 103 is extended from the stem of the contact member 57, which latter is pivoted at its upper end to the casing 68 so as to be swingable toward and away from the arm 62. The core 103 extends into a solenoid 104, which latter is connected at its opposite terminals to the wires 59 and 72 respectively, thus the solenoid 104 is directly in the supply circuit and is subject to the changes of characteristics of the main supply current. As a current characteristic of the supply of electricity changes, the solenoid action also varies in proportion therewith, and the core 103 is drawn into or let out of the solenoid 104. The gravity of the member 57 urges the same to depend vertically from its pivot. Consequently whenever the natural change of a characteristic of the supply current increases, or decreases the relative swing of the arm 62, such increase or decrease is compensated for by the moving of the contacts 56 and 58 further away, or nearer to the tip of the arm 62. Thus to close the circuitbreaker 33 the arm 62 must at all times have the same relative stroke.

It will be recognized that my device is a particularly efficient, and foolproof coin tester and ejector mechanism, which is readily adapted to conform to any condition required to separate good coins and spurious coins. The size and adjustment, and the instrumentalities of the aforedescribed device can be easily designed to accommodate coins of various metals, and of various electric resistivity and conductivity.

Having thus described my invention, what I now claim as novel, and desire to secure by Letters Patent is:

1. In a testing device an electric indicator including a source of electricity; contacts by means of which a material can be connected in series with said circuit, means to indicate the resistance of the circuit according to the conductivity of the material connected in the circuit, and means on said indicator being connected to said source of electricity to correct the indicator means in accordance with variances of current originating in the circuit from sources independent from said material.

2. In a coin testing device the combination of an electrically operated coin selector connected to a source of electricity, a circuit breaker connected in series with the selector, means connected to the source of electricity to connect a coin to be tested to said source of electricity, means responsive to the current flowing through the connected coin to close said first circuit breaker when coins of a certain metal are connected in the circuit, and to leave open the said circuit breaker at other times, and means to automatically correct said circuit breaker closing means in accordance with variations of current in the circuit originating from causes independent from the coin.

3. In combination means to guide a moving coin; electromagnetic means operatively related to said means to selectively direct the moving coin into either one of two paths, a normally open circuit breaker to connect the said electromagnetic means to a source of electricity; control means for the said circuit breaker including spaced contacts related to said guiding means and connected to a source of electricity, said contacts being adapted to be connected to each other by a coin passing through the guiding means so as to complete the electric circuit from contact to contact through the said coin; and electro-responsive means actuated by the electric cir-

cuit passed through the coins to close said circuit breaker when coins of a certain metal are in circuit closing position and to leave the circuit breaker in open position when coins of other metals connect the said contacts to each other, and means for adjusting the electro-responsive means to variations of the current in the circuit leading from the source of electricity.

4. The combination with a coin guide and with a source of electricity, of a plurality of spaced contacts in the guide connected to the source of electricity and being adapted to be bridged by a coin passed thereover in the guide, an electrically actuated circuit breaker responsive to a characteristic of the current passed through the bridging coin dependent on the conductivity of the metal of which the coin is made, so as to close the circuit breaker when the bridging coin is of a certain metal, and to leave the circuit breaker open other times; and an electro-magnetically operated selector connected to the source of electricity through said circuit breaker to direct the coins on a path when the circuit breaker is closed, and onto another path when the circuit breaker is open, and means in the guide to slow down the movement of the coin at said contacts and to guide the coin so that a face of the coin engages the said contacts.

5. The combination with a coin guide and with a source of electricity, of a plurality of spaced contacts in the guide connected to the source of electricity and being adapted to be bridged by a coin passed thereover in the guide, an electrically actuated circuit breaker responsive to a characteristic of the current passed through the bridging coin dependent on the conductivity of the metal of which the coin is made, so as to close the circuit breaker when the bridging coin is of a certain metal, and to leave the circuit breaker open other times; and an electro-magnetically operated selector connected to the source of electricity through said circuit breaker to direct the coins on a path when the circuit breaker is closed, and onto another path when the circuit breaker is open, and means connected to the source of electricity to adjust the contacts of the said circuit breaker in accordance with the variations of the current originating from the source of electricity.

6. The combination with a coin chute and a source of electricity of a coin selector including a selector trap related to the chute, an electromagnet to move the trap when the former is energized, a circuit breaker connected in series between the electromagnet and the source of electricity to normally break connections between the electromagnet and the source of electricity, the trap being adapted to be automatically moved into one position, and to be moved into another position by the energized electromagnet thereby to direct the coin in either one of two selected paths; means in the chute contacting the coin before the same reaches the trap to complete an electric circuit from the source of electricity through the coin in parallel with the electromagnet; and means connected in series with the said contacting means and being responsive to a characteristic of the current through the coin, dependent on the metal of the coin, to close said circuit breaker only when the said parallel circuit is completed through coins of a certain conductivity.

7. The combination with a coin chute and a source of electricity of a coin selector including a selector trap related to the chute, an electromagnet to move the trap when the former is energized, a circuit breaker connected in series between the electromagnet and the source of electricity to normally break connections between the electromagnet and the source of electricity, the trap being adapted, to be automatically moved into one position, and to be moved into another position by the energized electromagnet thereby to direct the coin in either one of two selected paths; means in the chute contacting the coin before the same reaches the trap to complete an electric circuit from the source of electricity through the coin in parallel with the electromagnet; and means connected in series with the said contacting means and being responsive to a characteristic of the current through the coin, dependent on the metal of the coin, to close said circuit breaker only when the said parallel circuit is completed through coins of a certain conductivity, and means responsive to changes of the current issuing from the source of electricity to compensate the operation of said circuit breaker for the said changes.

8. In combination a chute adapted to guide a moving coin; means related the chute to selectively direct the coin into either one of two directions, electromagnetic means to actuate said directing means; a normally open circuit breaker connected in series between said electromagnetic means and a source of electricity; means related to the chute to connect a moving coin to a source of electricity; and self-correcting electroresponsive means connected in series with said connecting means and operatively related to said circuit breaker so as to be inoperative when a metal of a certain conductivity is connected in series therewith and to close said circuit breaker when coins made of metal of higher conductivity than that of said first mentioned metal coin are passed to said connecting means.

9. Means to eject a spurious coin from a chute for guiding "nickels", including, a trap normally urged in closed position to complement the chute electromagnetic means related to the trap and adapted to open the trap when the said electromagnetic means is energized to drop the coin out of the chute; a normally open circuit breaker connected in series between the said electromagnetic means and a source of electricity, a plurality of spaced contacts in the chute connected to a source of electricity and being so disposed in the path of the coin that the coin passed thereover bridges the respective contacts and completes the electric circuit therethrough, means connected in series with the said contacts and operatively related to the circuit breaker to actuate the latter, said last means being responsive to a characteristic of the electric current dependent on the conductivity of the coin so as to close said circuit breaker only when spurious metal coins of higher conductivity than that of a "nickel" are connected in the circuit at said contacts.

10. Means to eject a spurious coin from a chute for guiding moving silver coins, including a normally open trap, said chute having an opening in a side thereof through which spurious coins can drop out of the chute, said trap being adapted to be closed to cover said opening and to complement said chute, electromagnetic means to close the trap when energized; a normally open circuit breaker connected in series between the said electromagnetic means and a source of electricity; a plurality of spaced contacts in the chute, immediately preceding the said opening, being connected to a source of electricity and being dis-

posed in the path of the moving coin, so that said coin bridges the respective contacts and completes an electric circuit therethrough; means connected in series with the said contacts to actuate said circuit breaker, said last means being responsive to a characteristic of the current dependent on the conductivity of the coin so as to close the said circuit breaker only when coins of the conductivity of a silver coin are connected between the contacts.

11. Means to eject a spurious coin from a chute for guiding moving silver coins, including a normally open trap, said chute having an opening in a side thereof through which spurious coins can drop out of the chute, said trap being adapted to be closed to cover said opening and to complement said chute, electromagnetic means to close the trap when energized; a normally open circuit breaker connected in series between the said electromagnetic means and a source of electricity; a plurality of spaced contacts in the chute, immediately preceding the said opening, being connected to a source of electricity and being disposed in the path of the moving coin, so that said coin bridges the respective contacts and completes an electric circuit therethrough; means connected in series with the said contacts to actuate said circuit breaker, said last means being responsive to a characteristic of the current dependent on the conductivity of the coin so as to close the said circuit breaker only when coins of the conductivity of a silver coin are connected between the contacts; and means connected to a source of electricity to compensate the cooperation of said electroresponsive means with the circuit breaker for variances of the current originating from the course of electricity.

12. Means to eject a spurious coin from a chute for guiding "nickels", including, a trap normally urged in closed position to complement the chute; electromagnetic means related to the trap and adapted to open the trap when the said electromagnetic means is energized to drop the coin out of the chute; a normally open circuit breaker connected in series between the said electromagnetic means and a source of electricity, a plurality of spaced contacts in the chute connected to a source of electricity and being so disposed in the path of the coin that the coin passed thereover bridges the respective contacts and completes the electric circuit therethrough, means connected in series with the said contacts and operatively related to the circuit breaker to actuate the latter, said last means being responsive to a characteristic of the electric current dependent on the conductivity of the coin so as to close said circuit breaker only when spurious metal coins of higher conductivity than that of a "nickel" are connected in the circuit at said contacts; and adjusting means connected to a source of electricity to compensate the cooperation of said electroresponsive means with the circuit breaker for variances of the current originating from the source of electricity.

13. The combination with a coin tester and ejector of a pay telephone, of a chute in the box of a telephone pay station, said box having coin slots thereon, said chute comprising a plurality of inclined channels communicating with the respective slots and having the flat sides thereof disposed in substantial parallelism with the planes of said slots, corresponding inclined portions of said channels being twisted at the coin ejector to have the flat sides thereof substantially at right angles to said planes, and the discharge ends of said channels being united in a common block of discharge channels in a plane parallel with the plane of the intake end of the chute.

14. A chute in the box of a telephone pay station, said box having coin slots thereon, said chute comprising a plurality of inclined channels communicating with the respective slots and having the flat sides thereof disposed in substantial parallelism with the planes of said slots, corresponding inclined portions of said channels being twisted to have the flat sides thereof substantially at right angles the said planes, and the discharge ends of said channels being united in a common block of discharge channels in a plane parallel with the plane of the intake end of the chute, one of said channels being adapted to guide "nickels", a trap on the twisted intermediate portion of the "nickel" channel, said trap being adapted to be normally urged in closed position to complement a flat wall of the "nickel" channel and form a wall thereof, electromagnetic means to open said trap to release a coin from the chute, a normally open circuit breaker to connect the said electromagnetic means to the usual terminals of the operating circuit of the telephone box, spaced contacts in the said channel preceding the trap, being connected to the said telephone terminals, and being disposed to contact the face of a coin passing in the said channel and complete an electric circuit therethrough, circuit breaker actuating means connected in series with said contacts, and being responsive to a characteristic of the electric current dependent on the conductivity of the coin so as to close the circuit breaker only when spurious coins of higher conductivity than that of a "nickel" are contacted by said contacts.

15. A chute in the box of a telephone pay station, said box having coin slots thereon, said chute comprising a plurality of inclined channels communicating with the respective slots and having the flat sides thereof disposed in substantial parallelism with the planes of said slots, corresponding inclined portions of said channels being twisted to have the flat sides thereof substantially at right angles to the said planes, and the discharge ends of said channels being united in a common block of discharge channels in a plane parallel with the plane of the intake end of the chute, one of said channels being adapted to guide "nickel", a trap on the twisted intermediate portion of the "nickel" channel, said trap being adapted to be normally urged in closed position to complement a flat wall of the "nickel" channel and form a wall thereof, electromagnetic means to open said trap to release a coin from the chute, a normally open circuit breaker to connect the said electromagnetic means to the usual terminals of the operating circuit of the telephone box, spaced contacts in the said channel preceding the trap, being connected to the said telephone terminals, and being disposed to contact the face of a coin passing in the said channel and complete an electric circuit therethrough, circuitbreaker actuating means connected in series with said contacts, being responsive to a characteristic of the electric current dependent on the conductivity of the coin so as to close the circuit breaker only when spurious coins of higer conductivity than that of a "nickel" are contacted by said contacts; and a return chute below the trap to receive the spurious coin and guide the same to a refund slot of the telephone box.

16. The combination with a telephone pay station including a box, coin slots, a chute for guid-

ing silver coins from the coin slots, and electric terminals for the connection of the usual telephone operating mechanisms thereto, of a section in the chute so formed to guide the coins so that the coins slide face down on a flat side of the chute, a trap formed on said flat side, means to normally hold the trap in open position to allow the coins to drop out of the chute, an electromagnet related to the trap adapted to pull the trap into closed position when energized, said trap when closed complementing the said flat side of the chute; a circuit breaker to connect the electromagnet to the respective terminals; actuating means to close said circuit breaker; said actuating means being electrically actuated, spaced contact elements in the chute preceeding the trap so as to be bridged by a coin passing through the chute, said elements and said actuating means being connected in series to the respective terminals so that an electric circuit is completed through each coin passing through the chute; said actuating means being responsive to a characteristic of the said circuit dependent on the conductivity of the coin so as to close the circuit breaker only when silver coins are passed through the chute.

17. In a telephone pay station including a box, coin slots thereon, and terminals for the electric connections of the usual telephone operating mechanism, a channel in the box inserted in the slots, said channel being adapted to guide the coin in rolling position and having an opening on its flat side; a counterbalanced tray opposite the opening; an electromagnet connected to the respective terminals of the telephone to be constantly energized so as to pull spurious coins of magnetic qualities out of the chute through said opening and into the tray; means on the tray actuated by the coin in the tray to break the electric connection of the magnet and permit the tripping of the tray to drop the spurious coin therefrom; and means to guide the ejected coin to the refund slot of the telephone box.

18. In combination a circuit breaker, comprising a frame, a pair of spaced contacts connected in an electric circuit and supported on a movable element on the frame, and a normally inoperative movable member adapted to bridge the contacts to each other, electroresponsive means to move the said member into operative position, said electroresponsive means being connected to a source of electricity in parallel with the first mentioned circuit; and means to connect a coin in series with the electroresponsive means, said electroresponsive means being responsive to a characteristic of the electric current, dependent on the conductivity of the coin so as to move the said member into complete operating position only when the coin is conductive above a certain degree; and means responsive to variations of the current originating from the source of electricity and being adapted to adjust said movable support so as to compensate for said variations by the spacing of the contacts from the bridge.

19. In a telephone pay station, a box having coin slots therein, electric terminals to which the usual telephone operating mechanisms are connected, a chute in the box comprising a channel communicating with each slot, an intermediate portion of the chute being twisted to guide the coins in sliding position face down on a flat side of each channel, a trap for each channel to cover and complement a portion of the flat side of the channel, means to normally hold one of said traps in closed position to allow the passing of the coins thereover, means to normally hold the other traps in open position to allow the coins to drop out of the channel, electromagnetic means for opening the normally closed trap, electromagnetic means for closing the second trap; a normally open circuit breaker for each electromagnet connected to the respective terminals in the box, an electroresponsive operating mechanism for each circuit breaker to close the same, each operating mechanism being connected to the respective terminals in the box; spaced contacts in the respective channels connected in series with the respective operating mechanisms, said contacts being disposed in said channels so as to precede the respective traps and to be bridged by the coins passing toward the respective traps, each operating mechanism being adapted to operate only when its electric circuit includes a coin having higher than a predetermined conductivity; and means in the box to receive the coins dropped out of the said traps and to guide the same to a refund openings of the telephone box.

20. The combination with the contacts of a circuit breaker, one of the contacts being movable to the other contact for closing an electric circuit therethrough, of means to support the second contact including means connected to the electric circuit and being responsive to variations of the current in said circuit to move the second contact toward and away from the first contact to vary the distance between the contacts in open position according to said current variations.

21. In a circuit breaker, contacts connected to a source of electricity and to an electric mechanism operated by the said electricity; electroresponsive means to move one contact into engagement with the other to close an electric circuit therethrough; a self correcting floating support for the second contact comprising, an adjustable supporting element for the second contact, electromagnetic means connected to the part of the circuit leading from the source of electricity to said second contact, and means of connection between the said element and the said electromagnetic means to vary the position of said element and of said second contact in accordance with variations of current in the said part of the circuit.

22. The combination with a coin guide having an opening on a side thereof, of a magnetic tester for selecting coins of magnetic qualities from the guide through said opening, comprising a counterbalanced tray opposite the opening, a magnet to pull coins of magnetic qualities out of the guide through said opening and into said tray, means to swingably support said tray between the said opening and said magnet to permit the tripping of the tray by the weight of the coin to drop the coin therefrom.

23. The combination with a coin guide having an opening on a side thereof, of a magnetic tester for selecting coins of magnetic qualities from the guide, comprising, a counterbalanced tray opposite the opening, an electromagnet connected to a source of electricity to pull coins of magnetic qualities out of the guide through said opening and into the tray; and means to swingably support the counterbalanced tray between the opening and the magnet to permit the tripping of the tray by the weight of the coin to drop the coin therefrom.

24. In a coin actuated mechanism, a plurality of coin guides, each guide comprising a coin chute

having three oppositely inclined contiguous channel portions, the intermediate channel portion being twisted to guide the coin in a flat sliding position on its face, and each of the end portions providing channels in substantially vertical planes to guide the coin in edgewise rolling position both into and out of said intermediate portion; an ejector mechanism for spurious coins on the bottom of each intermediate channel portion, and a collector guide for spurious coins having fan shaped enlarged top below the ejector mechanisms and conforming in shape to the space and bend below said intermediate channel portions to receive ejected coins from all the ejector mechanisms.

VICTOR T. COMER.