

J. ELDRIDGE & C. MICHELSEN.

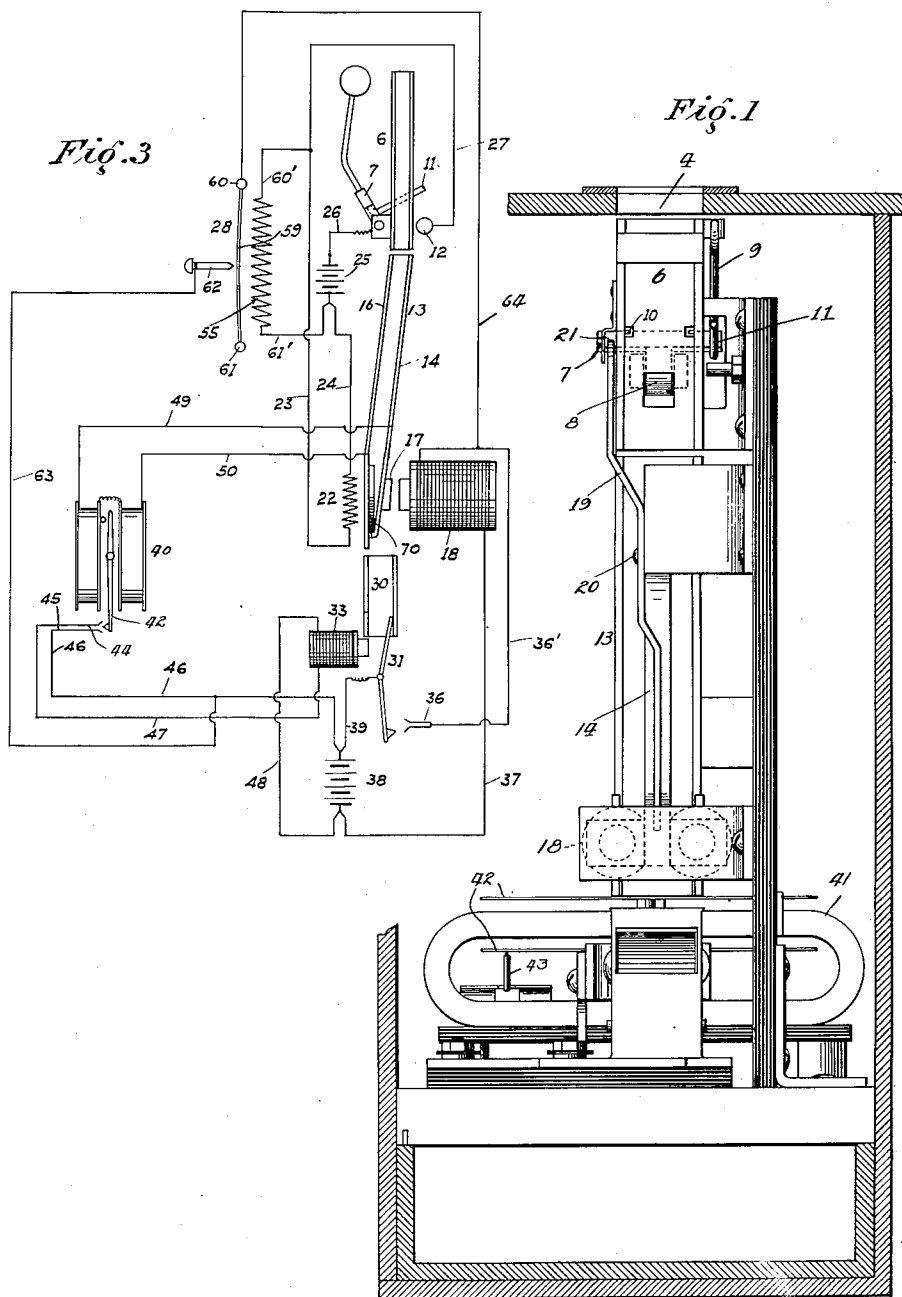
COIN SEPARATING DEVICE.

APPLICATION FILED SEPT. 21, 1915.

1,204,752.

Patented Nov. 14, 1916.

2 SHEETS—SHEET 1.



INVENTORS

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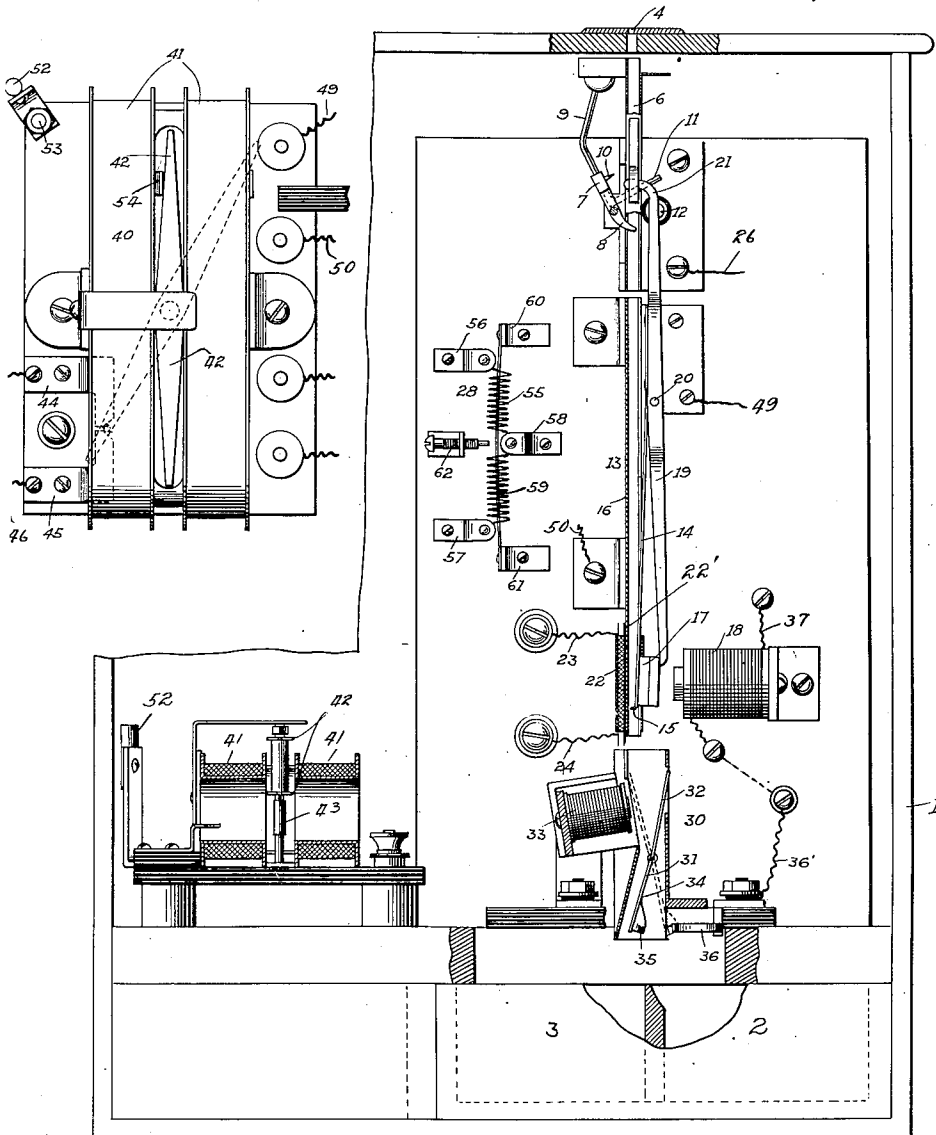
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Fig. 4

Fig. 2



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UNITED STATES PATENT OFFICE.

JOHN ELDRIDGE, OF OAKLAND, AND CHARLES MICHELSEN, OF PIEDMONT, CALIFORNIA.

COIN-SEPARATING DEVICE.

1,204,752.

Specification of Letters Patent.

Patented Nov. 14, 1916.

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To all whom it may concern:

Be it known that we, JOHN ELDRIDGE and CHARLES MICHELSEN, citizens of the United States, residing at Oakland and Piedmont, respectively, in the county of Alameda and State of California, have invented certain new and useful Improvements in Coin-Separating Devices, of which the following is a specification.

This invention relates to coin separating devices and more specifically to a device for separating coins from slugs of the same size.

The principal object of our invention is to provide a device for this purpose particularly adapted for operation of five-cent pieces, as this is the coin most commonly used in the various coin operating devices and for which slugs are most commonly substituted, and throughout this specification it will be understood that the word token embraces both coins and slugs.

Another object of our invention is to provide a device which will invariably separate the nickels from the slugs regardless of variations in diameter and thickness, and which does not depend on the impression being new or of any particular type.

Still another object of our invention is to provide a device which may be used in conjunction with the present coin controlled mechanisms being simply placed ahead of such mechanism and arranged to drop the good coins into the said mechanism and reject the slugs.

Still another object of our invention is to provide means whereby several tokens may be deposited at a time and the mechanism so arranged that one at a time is tested and dropped into the proper receptacle.

With these and other objects in view our invention consists in the novel construction, combination and arrangement of parts as herein illustrated and more specifically pointed out in the appended claims.

Reference being had to the accompanying drawings forming a part of this specification, Figure 1 is a view in section through the case containing our improved mechanism, showing the latter in side elevation.

Fig. 2 is a view in section through the improved device taken at right angles to the plane of view in Fig. 1. Fig. 3 is a diagrammatical view of the circuit arrangements employed in connection with the operating mechanism. Fig. 4 is a view in plan of the magnetically operated switch used to

control the mechanism which selects the coins from among the deposited tokens.

In the accompanying drawings we have illustrated our improved device within the case and provided with receptacles into which the coins and slugs are deposited, but it will be understood that in actual operation the device will be used in connection with other coin control mechanisms wherein the coins will be deposited in the chute leading to the coin controlled mechanism.

Referring to corresponding parts in the several views by the same numerals of reference, 1 denotes the case having the receptacles 2 and 3 for the coins and slugs respectively. In the upper portion of the case is an opening 4 through which the tokens are dropped into a vertical chute. This chute is formed in several portions having an air space between, thereby electrically insulating the portions one from another. The upper portion of the chute, denoted in general by 6, has a cross-section slightly larger than the coin and on the back thereof is pivotally mounted a member 7, the lower end 8 of which projects through an opening into the chute 6.

Extending upwardly from the member 7 is a weighted arm 9, so arranged that the center of gravity falls either to the back or front of the pivotal point, thereby either holding the end 8 within the chute 6 or holding the same wholly outside of the latter. In addition, the member 7 is provided above the pivotal point with several points 10, which are adapted to enter the chute and block the path therein when the end 8 is withdrawn. The member 7 has also attached thereto an arm 11, this arm being adapted, when the member is in its forward position, to contact with the metallic stud 12, which latter is insulated from the chute. The member 7 is normally positioned as illustrated and when the coin is deposited in the opening 4, the same falls downwardly and strikes the end 8 projecting through the chute, pushing it out of the chute thereby rotating member 7 causing the latter to throw the center of gravity on the opposite side of the pivot point and holds 11 in contact with the stud 12, thereby completing an electrical circuit, hereinafter described. The coin then falls downwardly through the second section of the chute, denoted in general by 13. This portion of the chute is also substantially of the same cross section

as the coin and is held in alinement with the upper chute portion 6. The front of this portion of the chute consists of a flexible spring member 14, which at its lower end is provided with a hook 15 extending almost into contact with the back wall 16. On the lower end of this spring 14 is attached an armature 17 adapted to be attracted by the electro-magnet 18.

19 denotes a lever arm pivotally mounted as at 20, having its lower end contacting with the back of armature 17, and having its upper end curved inwardly as shown at 21 and adapted to contact with the member 7 above the pivotal point when the latter is in its forward position. Thus when the electromagnet draws the armature toward itself, this lever is moved and the upper end presses back member 7 restoring it to its normal position. The coin in its downward travel is stopped by the hook end 15 and held in this position until released, as hereinafter described.

On the outside of the back wall of chute 16 is positioned a high resistance heating coil 22, which is insulated from the wall 16 by a thin layer of insulation 22' enabling the heat to be rapidly conducted from the coil to this wall, and the coil is connected by conductors 23 and 24 with the source of current 25. As illustrated in the diagrammatic view, the source of current 25 is on one side connected by conductor 26 to that portion of the chute 6 to which 7 is attached and the other side by conductor 27 to the stud 12. Thus when the token is deposited arm 11 contacts with stud 12 and establishes a flow of current through the heating coil 22. While we have shown the heating element 22 as being switched into circuit by the depositing of a token we may find it preferable to permanently connect the heating coil to the source of current, especially with devices which are frequently operated, the latter arrangement, of course, giving quicker action.

The lower portion of the chute, denoted in general by 30, is somewhat wider than the thickness of the coin and contains a pivotally mounted switch member 31 by which the coins and slugs are separated. The upper portion 32 of this switch is of magnetic material and is adapted to contact with either the front or back wall of the chute whereby the token is deflected into either receptacle 2 or 3. The operation of this switch is controlled by an electromagnet 33 acting upon the armature 32, swinging the switch to the position shown in dotted lines in Fig. 2. On the lower arm 34 of this switch is a contact member 35 adapted to make contact with the spring clips 36 when the switch is attracted by the magnet. These clips being connected by conductor 36' with one terminal of the electromagnet

18, the other terminal of which is connected by conductor 37 with a source of current 38, the switch 31 being connected by conductor 39 with the opposite side of the source of current. The electromagnet 33 receives its current over a circuit controlled by a sensitive current-indicating device 40, which as herein indicated consists of an astatic galvanometer having the coils 41 and the oppositely magnetized needles 42, one being suspended in the center of the coils, the other on the outside. The inner of these needles carries a suspended contact making member 43 adapted to make contact between the conducting members 44 and 45, the latter being connected by conductor 46 with one side of the source of current 38, the other being connected by conductor 47 with one terminal of electro-magnet 33, the other terminal of the latter being connected by conductor 48 with the opposite side of the source of current. If the chute wall 16 is of brass and is heated and a five-cent piece which is of nickel alloy is placed in contact with this heated wall, a thermo-electric couple is thereby established and the voltage which is generated thereby causes a current to flow from the strip 16, through conductor 50 connected to one terminal of the coils 41 and from the opposite terminal of the latter through conductor 49 to the spring strip 14, which is in contact with the opposite side of the coin. This flow of current causes the needles 42 to rotate in such a direction that a member 43 completes the circuit between the contact clips 44 and 45.

52 denotes a small permanent magnet pivotally mounted on a screw 53 whereby the distance between it and the poles of the needles may be adjusted so as to bring the same back against the stop 54.

The thermostat 28 may be of any type adapted to close an electric circuit but as here illustrated consists of the heating coil 55 mounted on terminals 56 and 57 and held in the center by an auxiliary support 58. Extending through the center of this coil is the expansion strip 59, the ends being rigidly held by the terminals 60 and 61, the strip having a slight initial bend so as when it becomes heated it will always expand in the given direction. Positioned adjacent the center of this strip is an adjustable contact 62, which is connected by conductor 63 with conductor 46 and thus to one side of the source of current 38. One of the terminals as 60 is connected by conductor 64 with the first terminal of the electromagnet coil 18, the other terminal of which is connected to the opposite side of the source of current 38. The heating coil 55 of the thermostat receives current through conductors 60' and 61', the former being connected with conductor 27 and thus through the contact member and stud 12 with one side of the

battery, the latter being connected to the opposite side of the source of current 25.

Having thus described the various electrical and mechanical features of the device its operation is as follows: When a token is dropped through 4 into the upper portion of the chute 6, member 7 is moved as previously explained and contact is made between arm 11 and stud 12, thereby causing current to flow from 25 through conductor 26 to the metal work of the chute 6, thus through the arm 11, stud 12, conductor 27 to the heating coil 22 on the back of chute 13, and from the heating coil through conductor 24 to the opposite side of the source of current. Current also flows from conductor 27 through conductor 60' to the heating coil 59 of the thermostat and from the latter through conductor 61' to the source of current. This causes the strip 59 to become heated and bow outwardly toward the contact 62. At the same time coil 22 heats the back wall 16 of the chute 13 where the latter is in contact with the coin, which is denoted by 70. The latter is now one element of a thermo-electric couple and current flows from 16 through conductor 50 to the current indicator, returning through conductor 49 to the spring strip 14, which is in contact with the opposite side of the coin. The arrangement of the current indicator with relation to the polarity of the thermo-electric couple is such that the needle moves in a clockwise direction closing the contact between members 44 and 45, whereby current flows from 38 over conductor 48, the electromagnet coil 33, conductor 47 across the members 44 and 45 and through the conductor 46 to the opposite side of the source of current 38. This flow of current causes the electromagnet 33 to attract its armature 32 thereby placing the upper portion across the chute 30 in such a direction that when a coin is dropped it is deflected into the receptacle 2. The movement of the switch 31 brings the contact on the lower end thereof in connection with the spring clips 36 thereby completing a circuit from 38 over conductor 37 through electromagnet 18, conductor 36', the clips 36, to the switch 31 and then over conductor 39 to the other side of the source of current. The energizing of 18 causes it to pull up the armature 17 and with it strip 14 thus withdrawing the bent end 15 from under the coin allowing the latter to drop into the lower portion of the chute and be deflected into the receptacle 2. The movement of this coin between the switch member 31 and the front walls of 30 opens the contact between 35 and 36 and restores the switch member 31 to its normal position as is shown in solid lines in Fig. 2. The movement of armature 17 by the electromagnet 18 causes lever 19 to restore member 7 to its normal position. If

while the operation just described is proceeding another coin or slug be dropped through the opening 4 this coin is held by the contact points 10, which extend into the upper portion of the chute 6 and when 7 is restored to its normal position this coin then drops downwardly causing the member 7 to again complete the circuit. This arrangement prevents more than one token from being dropped into the lower portion of the chute. Now, if a slug is used instead of a coin, the circuit is completed in the same manner and the heating of both the thermostat and coil 22 proceeds as before but no thermo-electro action takes place between the slug and the wall 16. Then strip 59 expands until contact is made with 62, which completes a circuit from the source of current 38, conductor 37, electro-magnet 18, conductors 36' and 64, strip 59, contact 62, conductors 63 and 46 to the source of current. This withdraws the spring 14, allows the slug to drop downwardly, but owing to the fact that the switch member 31 is in its normal position, the slug is deflected into the receptacle 3.

Thus it will be seen that we have provided a device which will absolutely separate coins from slugs, the action depending on the thermo-electromotive force established between the brass strip 16 and the nickel coin. This couple gives the most satisfactory results, slugs of various other metals not forming a couple which gives sufficient electro-motive force to operate the current indicator. Brass slugs are the most commonly used but being of the same metal as 16 will not give enough current to operate the indicator. With an iron slug, the difference of potential between the two metals is very slight in the first place and is in the opposite direction from that of brass and nickel, consequently, any tendency of the current indicator to deflect in the opposite direction is prevented by the stop 54. The only slugs which our device can operate are those of a German silver but these being so uncommon and comparatively expensive there is very little likelihood of the same being used. If by chance a slug of this character is dropped into the device the same will be accepted as a good coin, which is more desirable than that good coins should at times be rejected by machine. In the former case no offense is given to the patron, while in the latter case dissatisfaction always results.

For the successful operation of the device it is necessary that the timing of the thermostat 28 with reference to the thermo-electric couple be such that the latter may operate electromagnet 33 before contact is made by the former. Thus if the thermo-electric current will operate in three seconds the thermostat would be set to operate in, say,

six seconds so that there is no chance of the token being dropped before the switch 31 is operated.

While we have shown and described one form of our invention it will be understood that various changes and modifications may be made in details and construction of design without departing from the scope of the claims.

What we claim as new and wish to cover by Letters Patent is:—

1. A device for separating coins from other disks comprising means for making the coin one element of the thermo-electric couple, and means initiated by the thermo-electric current thus generated for separating the coins from the disks.

2. A device for separating coins from disks of other metal comprising means for holding the coins or disks in contact with a heated metal having relatively large thermo-electric properties with respect to the coins only, means for releasing the coin or disk to allow the same to fall by gravity and other means initiated by the thermo-electric current set up whereby the coins are deflected from the normal downward path.

3. A device for separating coins from other disks comprising a metal having relatively large thermo-electromotive force with respect to the coins only, means for heating said metal, means for holding the coins or disks in contact with said metal, means for releasing the holding means for said coins after a predetermined interval and other means initiated by the thermo-electric current set up whereby the coins are deflected from their normal downward path.

4. A device for separating coins from other disks comprising a metal having relatively large thermo-electromotive force with respect to the coins only, means for heating said metal, means for holding the coins or disks in contact with said metal, an electromagnet for releasing the holding means for said coins or disks, a thermostat, an electric circuit closed by said thermostat adapted to energize said electromagnet and other means initiated by the thermo-electric current set up whereby the coins are deflected from their normal downward path.

5. A device for separating coins from other disks comprising a metal having relatively large thermo-electromotive force with respect to the coins only, means for heating said metal, means for holding the coins or disks in contact with said metal, means for releasing the holding means for the coin or disk to allow the same to fall by gravity and other means initiated by the thermo-electric current set up whereby the coins and disks are caused to travel different downward paths.

6. A device for separating coins from other disks comprising a metal having rela-

tively large thermo-electromotive force with respect to the coins only, means for heating said metal, means for holding the coins or disks in contact with said metal, an electromagnet for releasing the holding means for said coins or disks, a thermostat, an electric circuit closed by said thermostat adapted to energize said electromagnet, an electric circuit for heating said thermostat, a circuit closer for said last-mentioned circuit operated by the depositing of a coin or slug, means for opening said circuit closer when said electromagnet is operated and other means initiated by the thermo-electric current set up for causing the coins and slugs to travel separate downward paths.

7. A device for separating coins from other disks comprising a metal having relatively large thermo-electromotive force with respect to the coins only, means for heating said metal, means for holding the coins or disks in contact with said metal, means for releasing the holding means for the coin or disk to allow the same to fall by gravity, a circuit closer operated by the thermo-electric current set up, a switch for deflecting the coins and disks into different paths, an electromagnet for operating said switch, and an electric circuit extending from said circuit closer to said electromagnet.

8. A device for separating coins from other disks comprising a thermo-electric couple, means for making the coin one element of said thermo-electric couple, a metal having relatively large thermo-electromotive force with respect to said coins only forming the other element of said thermo-electric couple, a circuit closer operated by the current from said thermo-electric couple, and means operated by said circuit closer for causing the coins and disks to travel separate downward paths.

9. A device for separating coins from other disks comprising a thermo-electric couple, means for making the coin one element of said thermo-electric couple, a metal having relatively large thermo-electromotive force with respect to said coins only forming the other element of said thermo-electric couple, a circuit closer operated by the current from said thermo-electric couple, a switch for deflecting the coins and disks into separate downward paths, an electromagnet for operating said switch and an electric circuit from said circuit closer to said electromagnet.

10. A device for separating coins from other disks comprising a metal having relatively large thermo-electromotive force with respect to the coins only forming therewith a thermo-electric couple, means for holding said coins and disks in contact with said metal, a circuit closer operated by the depositing of a coin or slug, a heating coil for the thermo-electric couple, an electro-

magnet adapted to release said holding means, a thermostatic circuit closer adapted to energize said electromagnet, a heating coil adapted to operate said circuit closer, an electric circuit including said first and said second-mentioned heating coils adapted to be closed by said circuit closer, a deflector switch adapted to cause said coins and said disks respectively to travel separate downward paths, an electromagnet adapted to operate said switch, a circuit closer operated by the current from said thermo-electric couple, an electric circuit extending from said last-mentioned circuit closer to said last-mentioned electromagnet, and a circuit closed by the operation of said switch adapted to energize said first-mentioned electromagnet. 15

In testimony whereof we affix our signatures.

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CHARLES MICHELSEN.