L. L. PIM & J. J. CHRISTMANN.

ELECTRIC TICKET SELLING DEVICE AND CHANGE MAKER.

APPLICATION FILED OCT. 18, 1910.

1,014,515.

Patented Jan. 9, 1912.

4 SHEETS—SHEET 1.

Fig. 1.

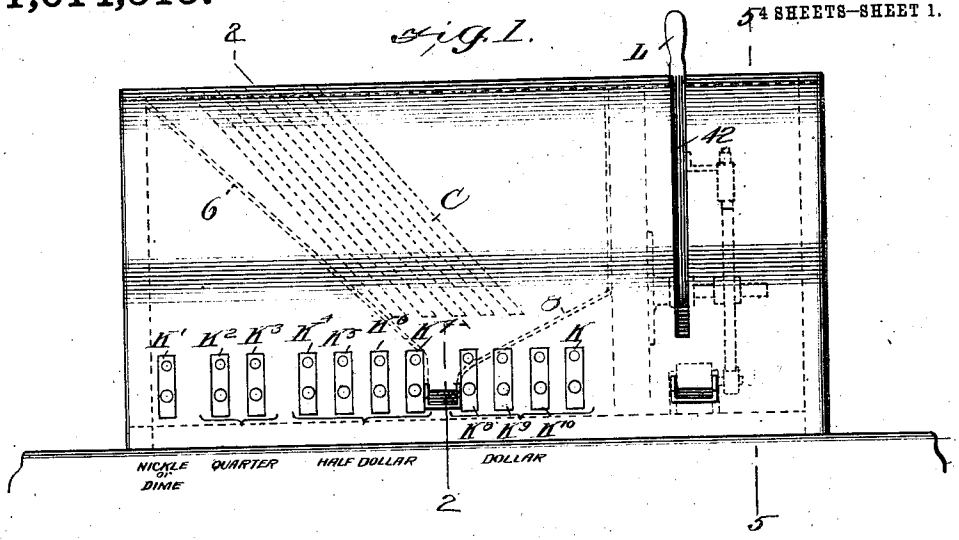

Fig. 2.

Fig. 3.

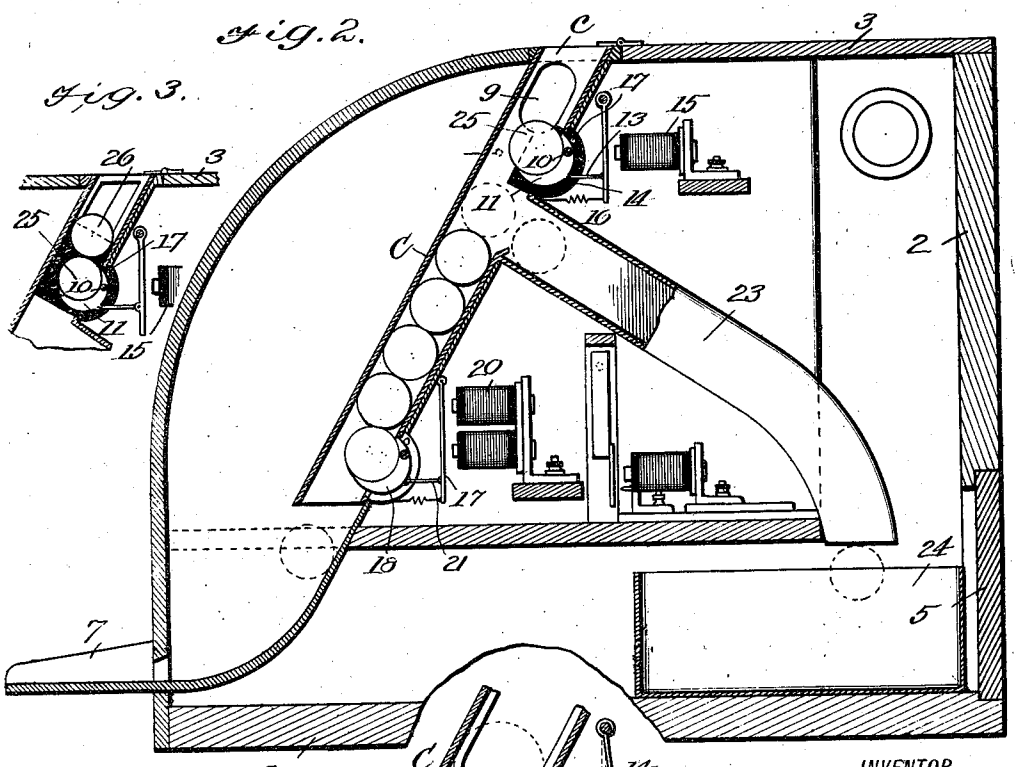

Fig. 4.

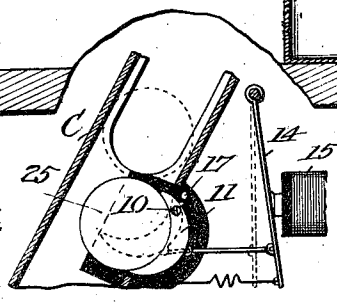

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Fig. 5.

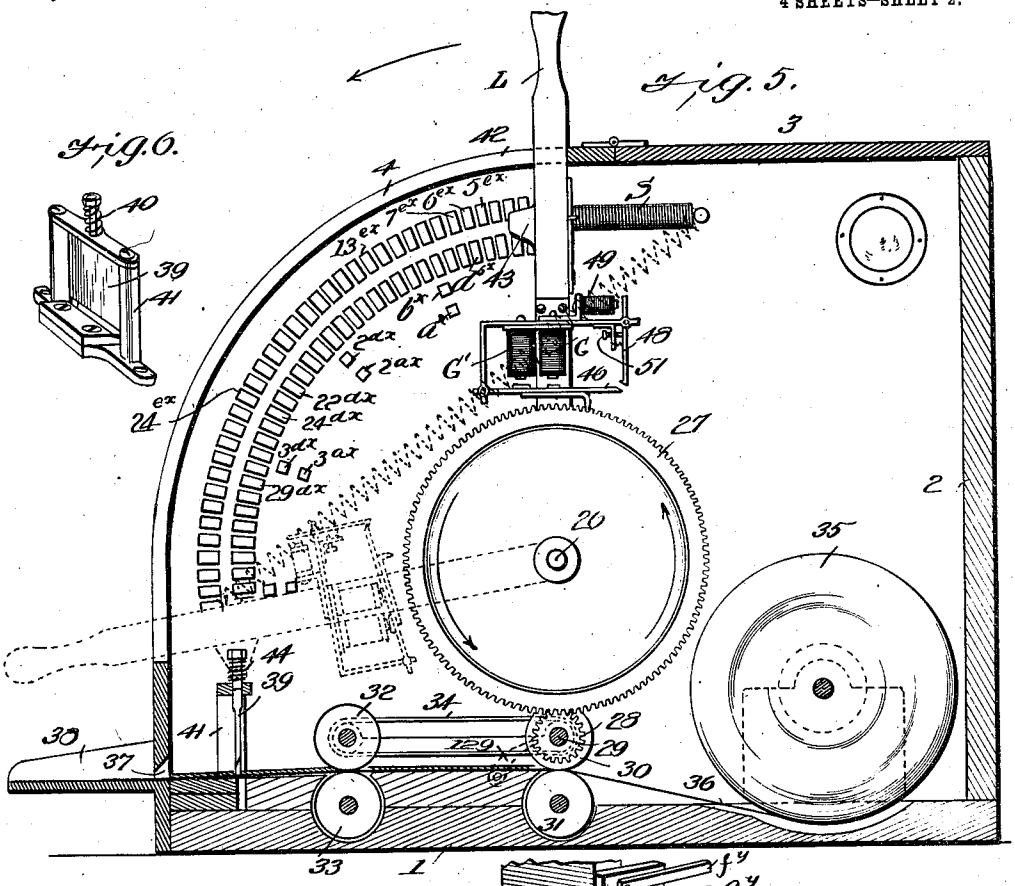

Fig. 6.

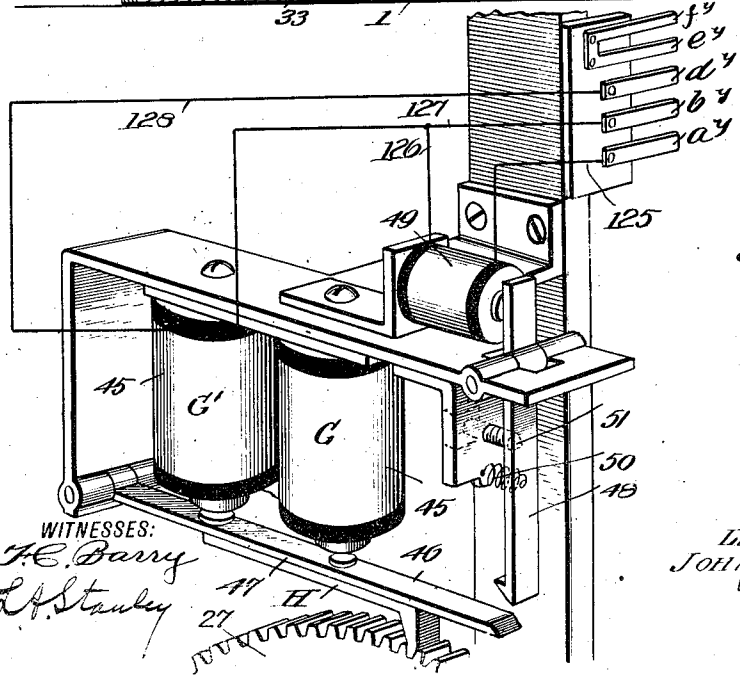

Fig. 7.

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4 SHEETS—SHEET 3.

Fig. 8.

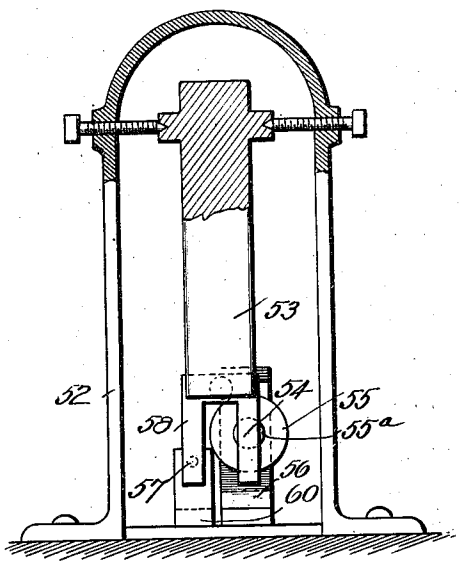

Fig. 9.

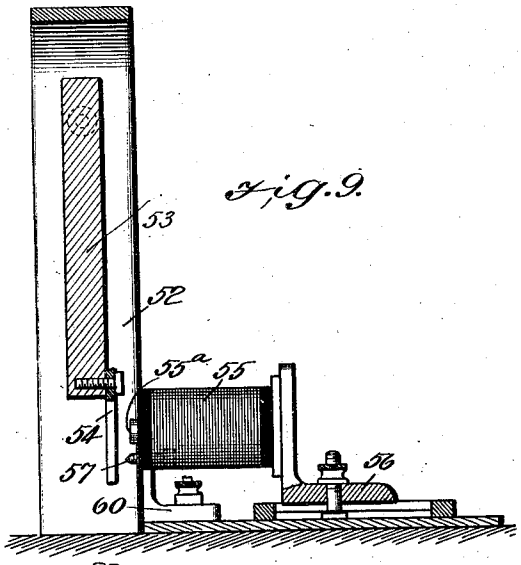

Fig. 12.

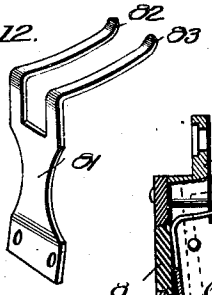

Fig. 10.

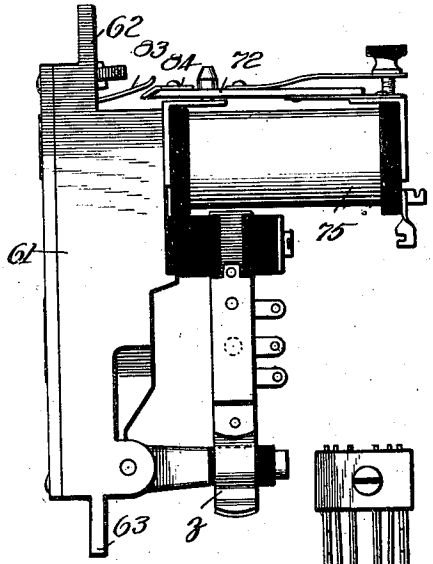

Fig. 11.

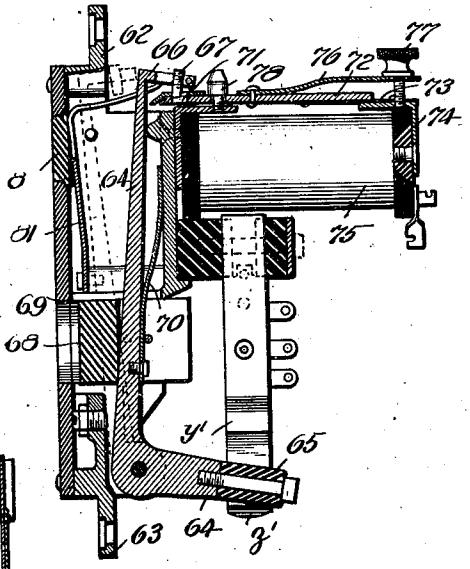

Fig. 13.

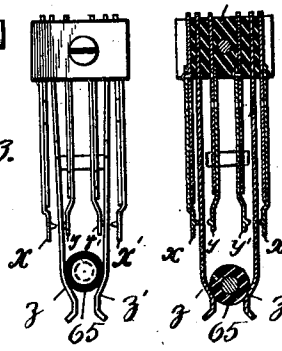

Fig. 14.

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4 SHEETS—SHEET 4.

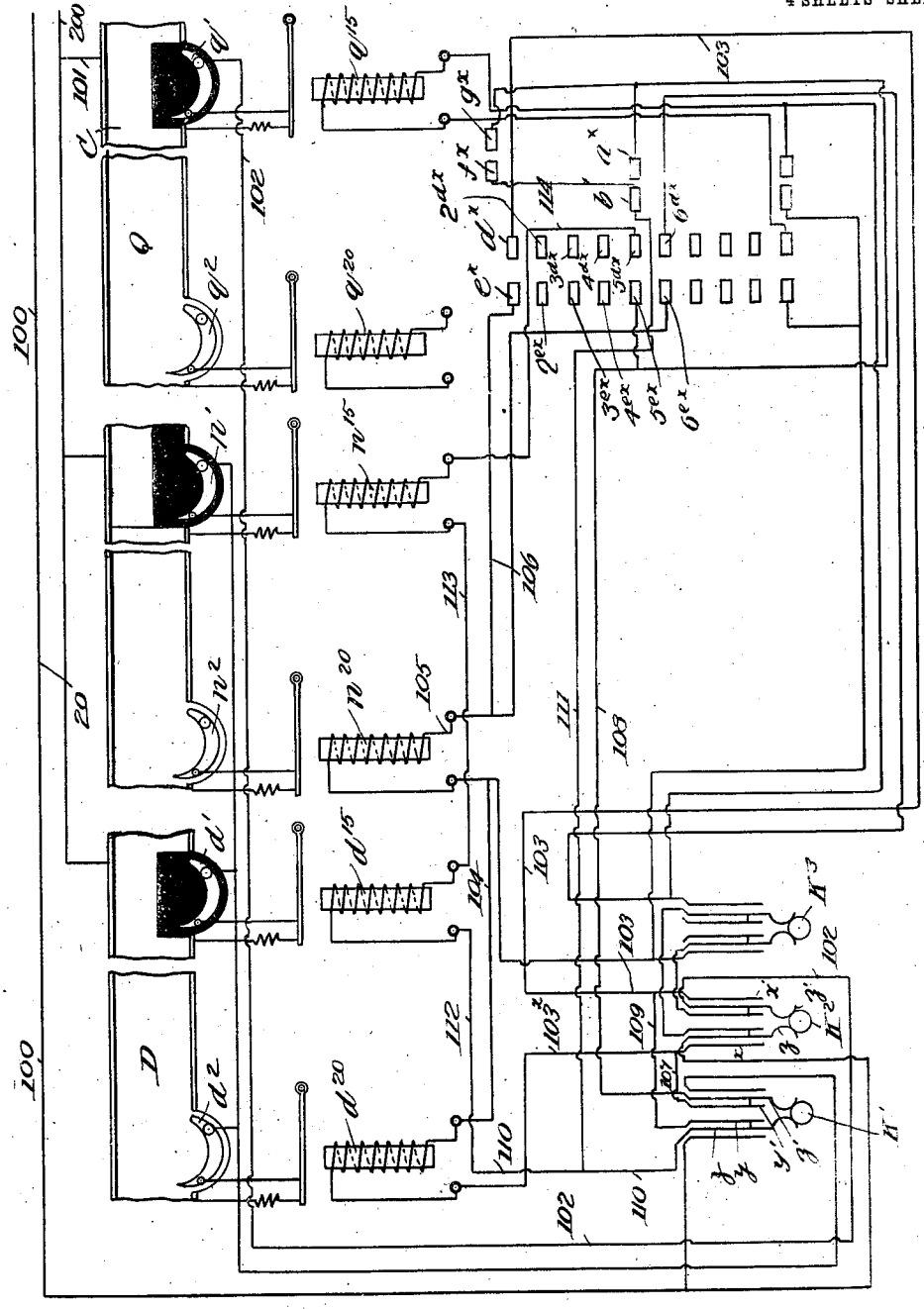

Fig. 15.

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UNITED STATES PATENT OFFICE.

LESLIE L. PIM AND JOHN J. CHRISTMANN, OF DENVER, COLORADO.

ELECTRIC TICKET-SELLING DEVICE AND CHANGE-MAKER.

1,014,515. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed October 18, 1910. Serial No. 587,660.

To all whom it may concern:

Be it known that we, LESLIE L. PIM and JOHN J. CHRISTMANN, citizens of the United States, and residents of Denver, in the county of Denver and State of Colorado, have made certain new and useful Improvements in Electric Ticket-Selling Devices and Change-Makers, of which the following is a specification.

Our invention relates to devices for vending tickets and for making change, and is particularly designed for use in theaters, parks and other amusement places, and it consists in the constructions, combinations and arrangements herein described and claimed.

An object of our invention is to provide a device capable of receiving coins of different denominations and of returning therefor one or more tickets and the change in coins of other denominations than that put into the machine.

A further object of our invention is to provide means for feeding tickets from a continuous roll, and for cutting them from said roll previous to their delivery to the purchaser.

A further object of our invention is to provide electrical means including a set of keys corresponding to the denomination of the coins which may be manipulated so as to affect the closure of electrical circuits for operating the change making mechanism.

A further object of our invention is to provide means for returning coins to the purchaser when said coins are placed in slots other than those intended for them.

These are a few of the objects of the invention.

Other objects and advantages will appear in the following specification and the normal features of the device will be pointed out in the appended claims.

Our invention is illustrated in the accompanying drawings forming part of this application, in which similar reference characters denote like parts in the several views, and in which—

Figure 1 shows a side view of the device, Fig. 2 is an enlarged detail sectional view along the line 2—2 of Fig. 1, Fig. 3 is a sectional view in detail through the "nickel" chute, Fig. 4 is a similar view through the "dime" chute, Fig. 5 is an enlarged section along the line 5—5 of Fig. 1, Fig. 6 is a perspective view showing the cutter, Fig. 7 is a perspective view showing a magnetically controlled pawl for turning the gear which drives the ticket feeding mechanism, Fig. 8 is an under view partly in section of one of the relays used in making change, Fig. 9 is a side view partly in section of the relay 1 in Fig. 8, Fig. 10 is a side view showing the key mechanism, Fig. 11 is a sectional detail view of the key mechanism, Fig. 12 is a perspective view showing the means for disengaging the key mechanism when the latter has become stuck, Fig. 13 is a view showing the spring contacts, Fig. 14 is a sectional view showing the spring contacts in another position, and Fig. 15 is a diagrammatical view showing the circuit connection of the device.

In carrying out our invention, we provide a main box or casing consisting of a bottom 1, a rear portion 2, a hinged top 3 and a front curved portion 4. The rear portion 2 is provided with a removable door 5 (see Fig. 2).

Within the box are a series of inclined coin chutes, which we will denote in general by C. Each of these chutes terminates in the upper part of the box at a slot *c*, such as that shown in Fig. 2. One of the chutes is for the reception of nickels, another one for dimes, a third for quarters and others for fifty cents, one dollar, etc. Beneath the chutes is an inclined partition 6 whose lower end is adjacent a delivery chute 7. Another inclined partition 8 also leads toward the delivery chute 7. The construction of the chutes is similar and the description of one will answer for the rest.

The chutes are best illustrated in Fig. 2. It will be seen that there is an opening 9 near the slot *c*. This opening is of a size smaller than the coin which is intended to be placed in the chute, but is larger than coins of less size than the one designed for the chute. In Fig. 2 the section is taken along the line 2—2 of Fig. 1, as above stated. The opening 9 is, therefore, in the bottom as well as on the side of the chute. This chute being the "quarter" chute. A dime or nickel placed in the chute will at once fall through the opening 9, and will be

caught by the partition 6 and returned to the owner through the delivery chute 7. In Fig. 2 it will be observed that the chutes are inclined from the rear to the front as well as from one end toward the other.

Pivotally mounted at 10 is a crescent-shaped stop member 11, which is suitably insulated from the walls of the chute by the insulation 12. The crescent shaped stop forms a conducting member. It is pivotally connected by means of a bar or rod 13 to the armature 14 of an electric magnet 15. The armature is normally kept away from the pole of the magnet by the spring 16. This serves to keep the lower end of the crescent-shaped member 11 projected within the chute, so as to engage any coins which happen to be placed in the chute. A stop pin 17 is provided to limit the inward movement of the lower end of the crescent-shaped member 11.

The lower end of the chute is provided with a smaller crescent-shaped member 18 which is actuated by the armature 19 of the magnets 20. The armature is connected by means of the rod 21 with the member 18, and is held by the spring 22 away from the pole pieces of the magnets while the crescent-shaped member 18 is projected within the chute, so as to engage any coins which have passed therein, so as to prevent their being discharged into the delivery chute 7. A branch chute 23 is provided into which the coins may pass after they have left the lower part of the large chute C. The end of this chute 23 terminates immediately above a coin box 24 placed in the bottom of the main box or casing. In Fig. 3, we have shown a chute which requires two nickels for its successful operation. In this figure it will be seen that the insulation 12^x is extended beyond the first coin 25, but not beyond the second coin 26. In Fig. 2 the coin 25 is designed to make an electrical contact between the crescent-shaped member 11 and the wall of the chute C, the crescent-shaped member being ordinarily insulated from the wall by the insulation 12. In Fig. 3, one coin will not make an electrical connection between the crescent-shaped member 11, but it requires two coins, as shown, in order to complete the electrical connection between the member 11 and the walls of the chute. In Fig. 4, we have shown the position of the member 11 at the time of the discharge of the coin 25, the magnet 15 having pulled up its armature 14.

Referring now particularly to Figs. 1 and 5, we have shown therein a lever L, which is pivotally mounted upon a shaft 26, the latter bears a gear 27 which meshes with a smaller gear 28 on a shaft 29 bearing a roll 30. The roll 30 is immediately above a pressure roll 31. The roll 30 is connected with another roll 32, which is just above another pressure roll 33, by means of a band or belt 34.

Disposed within the rear part of the main box is a ticket reel 35, which bears the tickets in the form of a ribbon 36. This ribbon is passed between the rolls 30—31 and 32—33 and out through an opening 37 in the front of the device on to a delivery chute 38. At 39 we have shown a knife which is kept by a spring 40 in upright position, but which may be pushed downwardly in the former 41 so as to sever the paper ribbon at any given point. The means for doing this will be described hereinafter.

Referring now particularly to Fig. 5, it will be seen that the lever L is normally held by means of the spring S in an upright position at the end of the slot 42. The lever bears on one side a lug 43, which is adapted to engage the head 44 of the knife 39 to push the latter downwardly. The movement of the lever from its upright position to its dotted line position, shown in Fig. 5, is designed to accomplish the feeding of the ticket ribbon 36. It will be seen that the lever L has secured to it the two magnets 45 whose armature 46 is provided on its under side with a pawl 47 adapted to engage the teeth of gear 27 when the magnets 45 are deënergized. The end of the armature 46 may be held in a locked position by means of the lower end of the armature 48 of the magnet 49. The armature 48 is held normally away from the core of the magnet 49 by means of the spring 50. The lower end of the armature, of course, being held inwardly. An adjustable-stop member is shown at 51. The lever L carries a series of terminals arranged to engage the respective series of terminals a' b' d' e' which are arranged in the shape of an arc. The function of these contact makers will be more definitely set forth hereafter.

The construction of the relay, which is used in making change, is best shown in Figs. 8 and 9. It consists of an arch-shaped member 52, preferably of brass, between the sides of which is suspended an armature 53, having an extension 54 extending downwardly above the pole piece of the magnet 55. The latter is secured to an adjustable base 56, which may be moved toward or away from the armature extension 54. A stop member 57 is provided which is designed to engage an extension 58 of the armature, so as to prevent the other extension 54 from actually coming into contact with the pole piece 55^a of the magnet 55. The stop piece 57 is carried upon an adjustable standard 60, as shown in Fig. 9.

The construction of the keys and of the spring contacts which they control is best shown in Figs. 10 to 14 inclusive. Each key

consists preferably of a brass casing 61, having an upper extension 62 and a lower extension 63 for attachment to the casing. Near the lower end of the casing is pivotally mounted a bell-crank lever 64, which bears an insulated contact member 65 on one arm, and has at the extremity of the other arm a laterally extending portion 66 provided with a set screw 67. A push button 68 is disposed in an opening 69 in the casing 61 and straddles the long arm of the lever 64 in the manner shown in Fig. 11. In Fig. 11 the push button is shown as being pushed in, so as to bring the short arm with the contact member 65 down between the springs, while the long arm is pushed inwardly against the tension of the leaf spring 70 so as to bring the pin 67 in registration with an opening 71 in a plate 72, which is secured by means of a spring 73 and a brass L-shaped member 74 carried by the magnet 75. A spring 76 above the plate 72 regulates the position of the end of the plate by means of the thumb screw 77. The movement of the plate 72 is limited by an adjustable stop member 78.

The contact springs are secured as shown in Figs. 13 and 14. In these figures, it will be seen that there are two outer springs x and x', two inner springs y and y', and two intermediate springs z and z', the latter being longer and engaging the insulated contact arm 65. These springs are suitably insulated from each other at their tops, as shown at 79, and are secured to the casing 61 just underneath the magnet 75.

Referring now again to Figs. 10 and 11, it will be seen that there is an upper push button 80 arranged to bear on a spring 81 of the shape shown in Fig. 12. This spring has two arms 82 and 83 at its upper end adapted to bear on the small plate 84, which is secured to the plate 72. The plate 84 has an inclined end, and the button 80 is provided for the purpose of freeing the long arm of the lever 64 in case the latter should become stuck by pressing downwardly on the end of the plate 76, thus allowing the arm to retract under the tension of the spring 70. The normal position of the long arm lever 64 is that shown in dotted lines in Fig. 11. In Fig. 1, we have shown a series of these sets of keys. At K′ is a key and release controlling the nickel and dime slot. At K^2 and K^3, we have shown two of the keys for the quarter. At K^4, K^5, K^6, and K^7, we have shown four for the half dollar and at K^8, K^9, K^{10} and K^{11} four for the dollar slot.

In Fig. 15, we have illustrated the working circuits, which the keys control, and in doing so we have shown only enough of these circuits to give a clear idea of the operation of the device, since to show the entire electrical connections would add to the multiplicity of lines and would result in confusion. Line 100 is designed to be connected with one side of a 110 volt circuit, the line 200 being connected with the other side. At D, we have shown the dime chute, at N the nickel chute, and at Q the quarter chute. At d' and d^2 are the crescent-shaped stop members for the chute D, while at n' and n^2 and q' and q^2 are similar stop members for the respective chutes N and Q. At d^{15} and d^{20} are the magnets corresponding to the magnets 15 and 20 in Fig. 2 for controlling the stop members d' and d^2. The magnets for the other chutes are shown at n^{15}, n^{20} and q^{15} and q^{20}, respectively. At K′, K^2 and K^3, we have shown three of the keys, the first one K′, being for the nickel and dime, and the keys K^2 and K^3 being for the quarter.

In Fig. 5 may be seen four rows of contacts, which are concentric with the axis of the lever L. The first row is denoted by a^x, $2a^x$, $3a^x$, etc., the second row by b^x, $2b^x$, $3b^x$, etc., the third row by d^x, $2d^x$, $3d^x$, $4d^x$, $5d^x$, etc., the fourth row by e^x, $2e^x$, $3e^x$, $4e^x$, $5e^x$, etc. The corresponding contacts of the two inner and two outer rows are adapted to be electrically connected in the manner hereinafter explained, *i. e.*, a movement of the lever may connect a^x and b^x or $2a^x$ and $2b^x$ together, while the same movement may connect $3d^x$ and $3e^x$ or $7d^x$ and $7e^x$. It will be observed that these contacts are divided into sets, which correspond with the numbers of the chutes or different coin values. Each set includes a pair of terminals denoted in general by a^x and b^x and the contacts in the two outer rows as far as the next pair of contacts in the rows a^x, b^x. In Fig. 5, we have shown the contacts in the rows denoted in general d^x and e^x as consisting of nine pairs in each set. This will provide for as many chutes as are liable to be used in the device. In Fig. 15, we have only shown five pairs in each set, in order not to crowd the drawing, but it will be understood that more or less might be used as desired. In addition we have provided a contact f^x in line with the contact a^x and a companion contact g^x beside it.

Let us suppose that the price of each ticket is ten cents, and one ticket is wanted by a person who has a quarter. The quarter is deposited in the proper slot, and falls down upon the stop member 11 (see Fig. 2) which is normally held in position to prevent further progress of the coin. It will be understood that each of the coin chutes is filled up to the over-flow chute 23 with coins in order to make change. The key 68 of the set K^2 is pressed. The long arm of the bell-crank lever 64 (see Fig. 11) is swung to the full line position shown in the figure and the pin 67 enters the opening 71 in the plate 72 thereby locking the key 68 in its

operative position. The insulating arm 65 has been shifted from its position as indicated in Fig. 13 to that indicated in Fig. 14.

Let us now consider the electrical connections effected by the deposit of the quarter. This is shown in Fig. 15. The lead wire 200 will be connected with the terminal d^x over the following path: conductor 101, the side of the chute C, through the coin stop q', and by the conductor 102 to the spring z' of the set K^2, and since the spring z' is now pressed against the spring x' through the latter and by means of the conductor 103 to the terminals d^x. The lead wire 100 will be connected with the terminal e^x over the following path: over 100 to the spring z of the set K^2, and through 103^x, coil d^{20}, 104, coil n^{20}, 105, and by 106 to e^x. It will thus be seen that it is only necessary to connect the terminals e^x and d^x to operate the magnets d^{20} and n^{20}. At this point let us take up branch circuits, which connect the terminals, a^x, g^x and b^x, f^x with the leads 100 and 200, respectively. We have traced the connection of the lead 100 of the spring w, of the set K^2 which connects with the conductor 103. The branch conductor 107 connects the spring y' of the set K' which is in contact with the spring z', the latter being connected by the conductor 108 to the terminals $5e^x$, a^x, and g^x. The lead 200 is connected with the terminals b^x, f^x over the following path: to the wire 103 by the circuit already traced through the springs z' and x' of the set K^2, thence by the conductor 109 to spring y of the set K', spring z, 110, 111, to b^x, and f^x. A branch connection from wire 110 is through 112, coil d^{15}, 113, coil n^{15}, and by the conductor 114 to terminal $5d^x$.

All description of the electrical circuit thus far has been to show how the pairs of terminals e^x, d^x, $5e^x$, $5d^x$, a^x, b^x, and f^x, g^x, are connected to the opposite lead wires. As will be seen from Fig. 7, the lever L bears a series of contacts a^y, b^y, d^y, e^y, and f^y. The terminals f^x and g^x are at the beginning of the series of contacts, as shown in Fig. 15, the contact members a^y and b^y resting upon the respective contacts g^x and f^x. A current is now established as follows through the magnet 49: from the lead wire 100 by the path already traced, through the conductor 103, 107, 108 to g^x, thence through the contact a^y, conductor 125, magnet 49, 126, 127 (see Fig. 7) through contact b^y, contact f^x and back to the lead wire 200 by the circuit already traced. The magnet 49 pulls up its armature, thereby throwing the locking member 48 outwardly and releasing the pawl H, which engages the gear 27. The operator now pulls downwardly on the lever, thereby turning the gear 27, causing an outward movement of the ticket slip 36. The contacts f^y and e^y now engage the contacts e^x and d^x. The contact e^x, as has been previously shown, is in electrical connection with the wire 100, while the contact d^x is in connection with the wire 200. There is, therefore, a circuit from the wire 100 to 200 through the coils d^{20} and n^{20}. The operation of the armature of the coil d^{20} pulls the stop member d^2 inwardly, thereby permitting a dime to drop from the chute D into the delivery chute 7. At the same time the actuation of the coil n^{20} will cause the armature to retract the stop n^2 so as to permit a nickel to be deposited in the chute 7. It will be understood that the lever is moving and as soon as the circuit is broken at the contacts e^x, d^x both of these stop members d^2 and n^2 are brought back into position by means of the springs to prevent any further delivery of coins from the chute. The contacts $5e^x$ and $5d^x$ are next engaged by the contacts f^y and e^y, respectively. The contacts $5e^x$ and $5d^x$ were connected by conductors to the opposite lead wires as already shown. A current, therefore, passes through coils d^{15} and n^{15} and the stop members d' and n' are thereby operated to let the coins, which were held by these stop members, into their respective chutes. If these chutes should be full then the coin will be deposited in the cash box 24 by means of the side chute 23, as shown in Fig. 2. Otherwise, the coin will pass down into the change making chute c. Simultaneously with the closing of the contacts $5e^x$ and $5d^x$ a circuit is established through the contacts a^x and b^x and through the contacts b^y and d^y. It will only be necessary to trace the circuit from the contact a^x around to b^x, since these contacts a^x and b^x have been shown before to be in connection with the respective conductors 100 and 200. The current then would flow from a^x through b^y, 127, magnet G, 128, d^x. The operation of the magnets G causes the pawl H to retract from the gear wheel 27. The gear wheel 27, therefore, stops being held in place by the pawl 129 (see Fig. 5). The action of the magnet, therefore, it will be seen regulates the number of tickets which are fed out by the gear wheel 27. The further movement of the lever L brings it into contact with the spring knife 39, which cuts off the ticket which has been delivered to the chute 38 through the opening 37. The lever is now free to return to its original position under influence of the spring S. The passage of the contacts a^y, b^y, d^y, e^y, and f^y over the segmental rows of contacts on the partition will not cause any further operation of the device, because the coin which was deposited for the ticket, and through which the electrical connections were established, has now been deposited into the change making

chute, and, therefore, these electrical connections are not made. It is only when a new coin is held by the first stop that the electrical connections are made for a subsequent feeding out of a ticket and the giving of the proper change. This instance will suffice to show the operation of the machine. It will be obvious that it is a machine which will enable ticket sellers to make change rapidly and to pass out tickets rapidly, since all that is needed is to give the lever a single downward pull, and let it return.

We claim:—

1. In a ticket selling and change making device, a casing, a plurality of metallic chutes in said casing, each chute being provided with a branch, a movable stop member disposed in each chute above said branch, said stop member being insulated from the walls of said chute, and means for actuating said stop member.

2. In a ticket selling and change making device, a casing, a plurality of inclined metallic chutes disposed within said casing, each chute being provided with an inclined branch, an upper stop pivotally mounted in each chute above said branch, and a lower stop pivotally mounted in each chute below said branch, said stop being insulated from the walls of said chute, and means for actuating said stops.

3. In a ticket selling and change making device, a casing, a plurality of inclined metallic chutes disposed within said casing, each chute being provided with an inclined branch, an upper stop pivotally mounted in each chute above said branch, said upper stop being insulated from the walls of said chute, a lower stop pivotally mounted in each chute below said branch, means for actuating said stops, said means comprising an armature connected with each stop, a magnet for actuating each armature, and current connections for said magnets.

4. In a ticket selling and change making device, a casing, a plurality of inclined metallic chutes disposed within said casing, each chute being provided with an inclined branch, an upper stop pivotally mounted in each chute above said branch, said upper stop being insulated from the walls of said chute, a lower stop pivotally mounted in each chute below said branch, means for actuating said stops, said means comprising an armature connected with each stop, a magnet for actuating each armature, and current connections for said magnets, said current connections including a series of keys and a contact lever.

5. In a ticket selling and change making device, a casing, a lever pivoted therein, a plurality of metallic chutes, a plurality of stops in each chute, one of said stops being insulated from the walls of said chute, a plurality of contacts arranged to be engaged by said lever, a series of magnets for operating said stops, said series of magnets being actuated by the closing of the contacts through the medium of said levers.

6. In a ticket selling and change making device, a plurality of metallic chutes, an upper and a lower stop for each chute, said upper stop being insulated from the walls of said chute, a releasing magnet for each of the lower stops, a lever provided with contacts, a series of contacts arranged to be engaged by the contacts on said lever, electrical connections between the magnets of the lower stops and certain of said series of contacts.

7. In a ticket selling and change making device, a plurality of metallic chutes, an upper and a lower stop for each chute, said upper stop being insulated from the walls of said chute, a releasing magnet for each of the lower stops, a lever provided with contacts, a series of contacts arranged to be engaged by the contacts on said lever, electrical connections between the magnets of the lower stops and certain of said series of contacts, a releasing magnet for each of the upper stops, and electrical connections between the magnets of the upper stops and certain other of said series of contacts.

8. In a ticket selling and change making device, a casing, a plurality of metallic chutes therein, an upper and a lower crescent shaped stop pivotally mounted in each chute, said upper stop being insulated from the walls of said chute, an armature pivotally mounted near each stop, a link connecting each armature with its respective stop, a magnet for operating each armature, and electrical means including a series of keys, and a circuit closing lever for actuating the magnets.

9. In a ticket selling and change making device, a casing, a plurality of inclined metallic chutes therein, an upper and a lower crescent-shaped stop pivotally mounted in each chute, said upper stop being insulated from the walls of said chute, an armature pivotally mounted near each stop, a link connecting each armature with its respective stop, a magnet for operating each armature, and electrical means including a series of keys, and a circuit closing lever for actuating the magnets, said actuating circuit being completed through the walls of the chute and said upper insulated stop.

10. In a ticket selling and change making device, a casing, a plurality of metallic chutes therein arranged to receive a conducting body, an upper and a lower crescent-shaped stop pivotally mounted in each chute for arresting the movement of said conducting body, said conducting body when so arrested forming a conducting me-

dium between the insulated stop and the conducting walls of the chute, an armature pivotally mounted near each stop, a link connecting each armature with its respective stop, a magnet for operating each armature, and current connections for said magnets, said current connections including a series of keys and a contact lever, the circuit through said current connections being completed through said conducting body, the walls of the chute, and the upper crescent-shaped stop.

LESLIE L. PIM.
JOHN J. CHRISTMANN.

Witnesses:
FRED. M. JAMES,
JOHN CAIN.