

Feb. 24, 1953

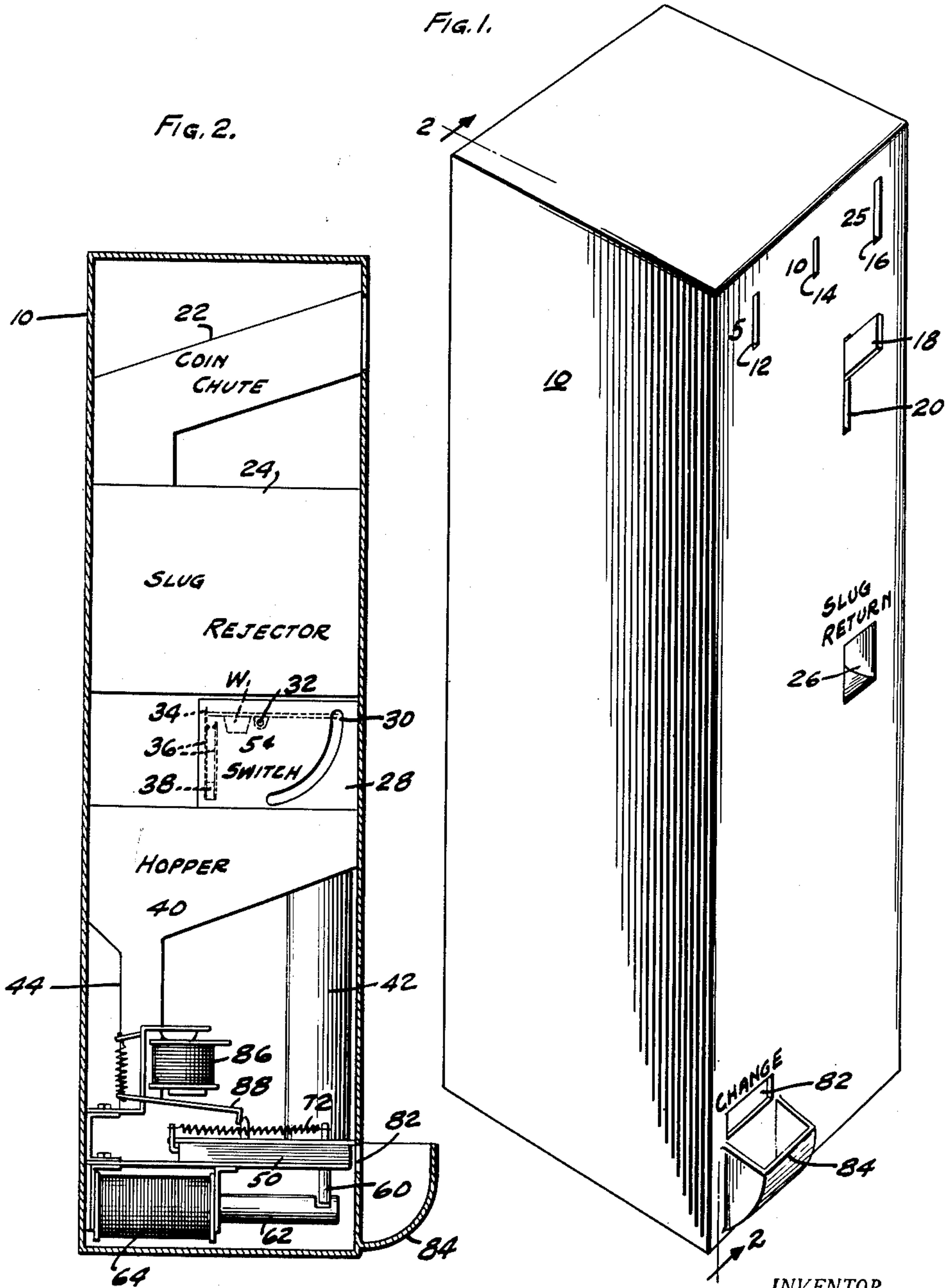
E. R. MAY

2,629,477

COIN CHANGER AND COIN CONTROL DEVICE

Filed Dec. 2, 1946

3 Sheets-Sheet 1



INVENTOR.

EDMUND R. MAY

BY

Harry H. Hitzman

ATTORNEY.

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E. R. MAY

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3 Sheets-Sheet 2

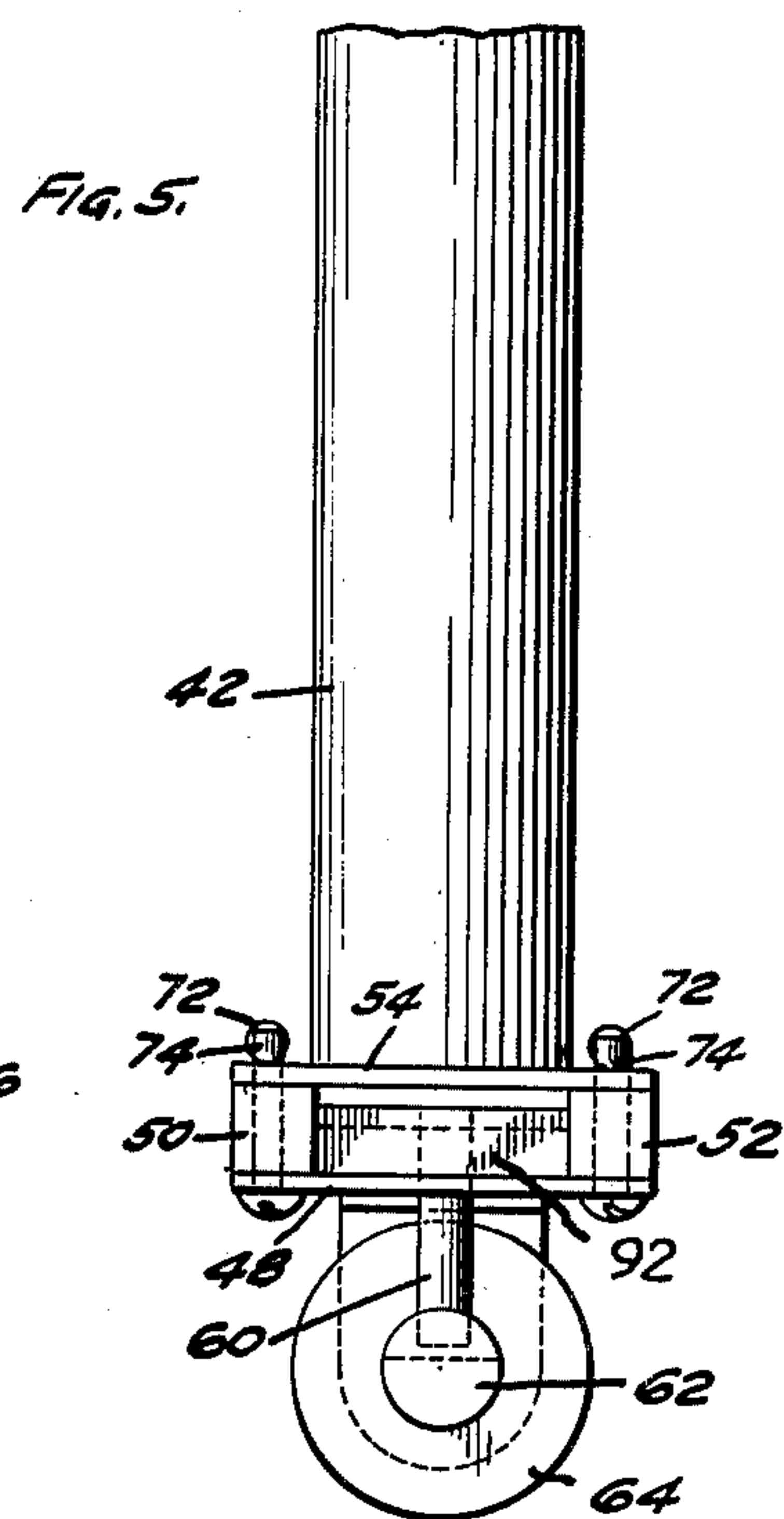
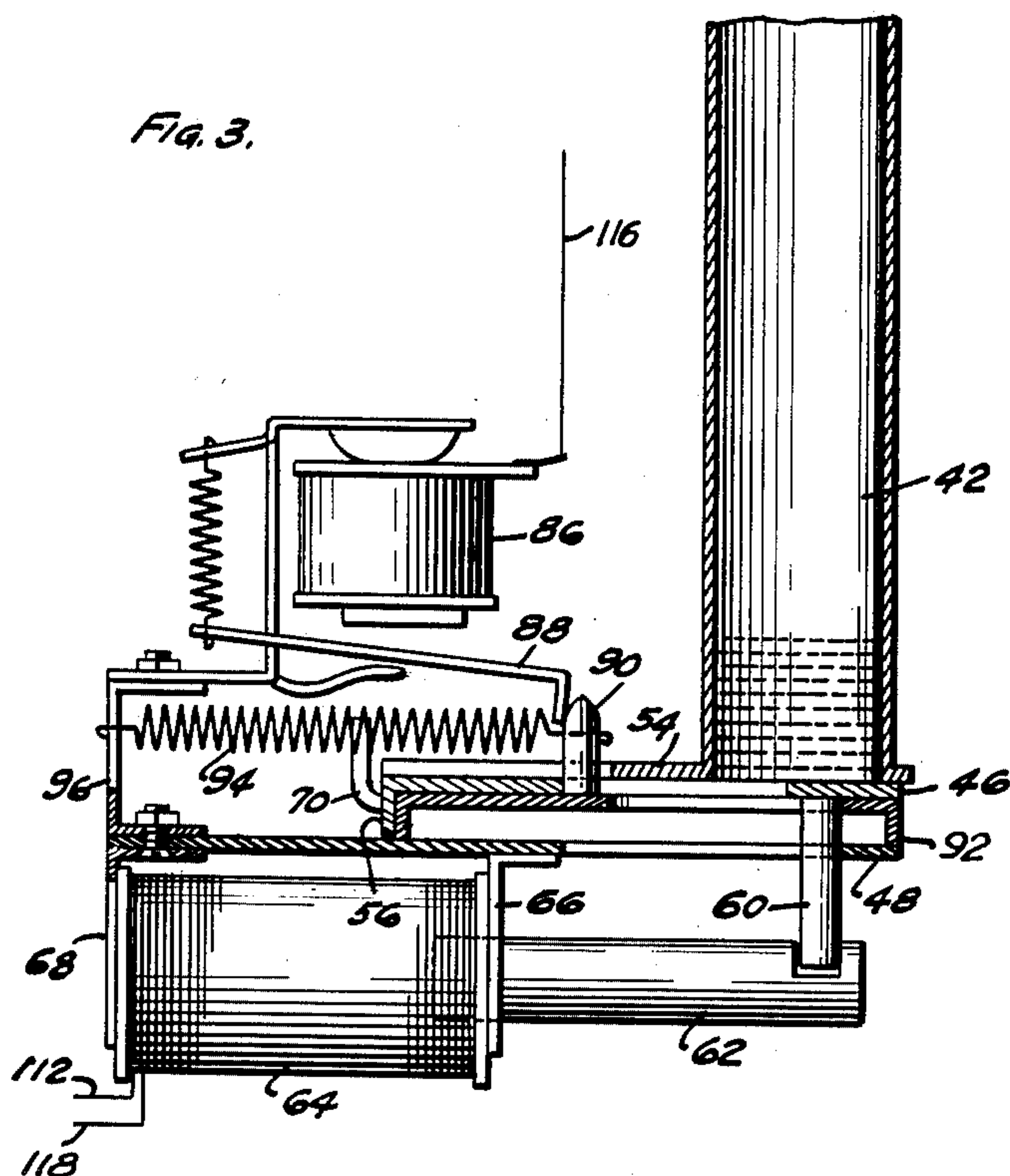
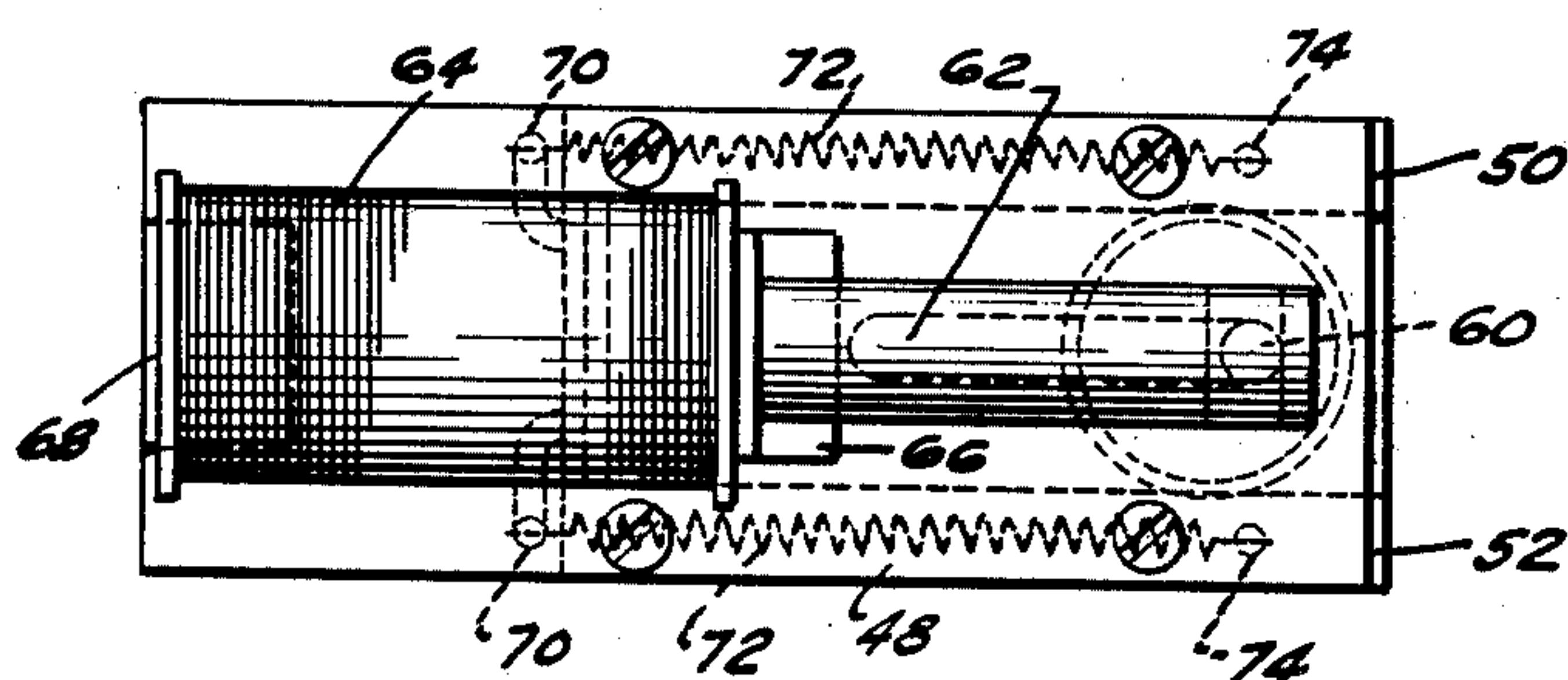


FIG. 6.



INVENTOR.
EDMUND R. MAY
BY
Harry H. Hitzeman
ATTORNEY.

Feb. 24, 1953

E. R. MAY

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FIG. 4.

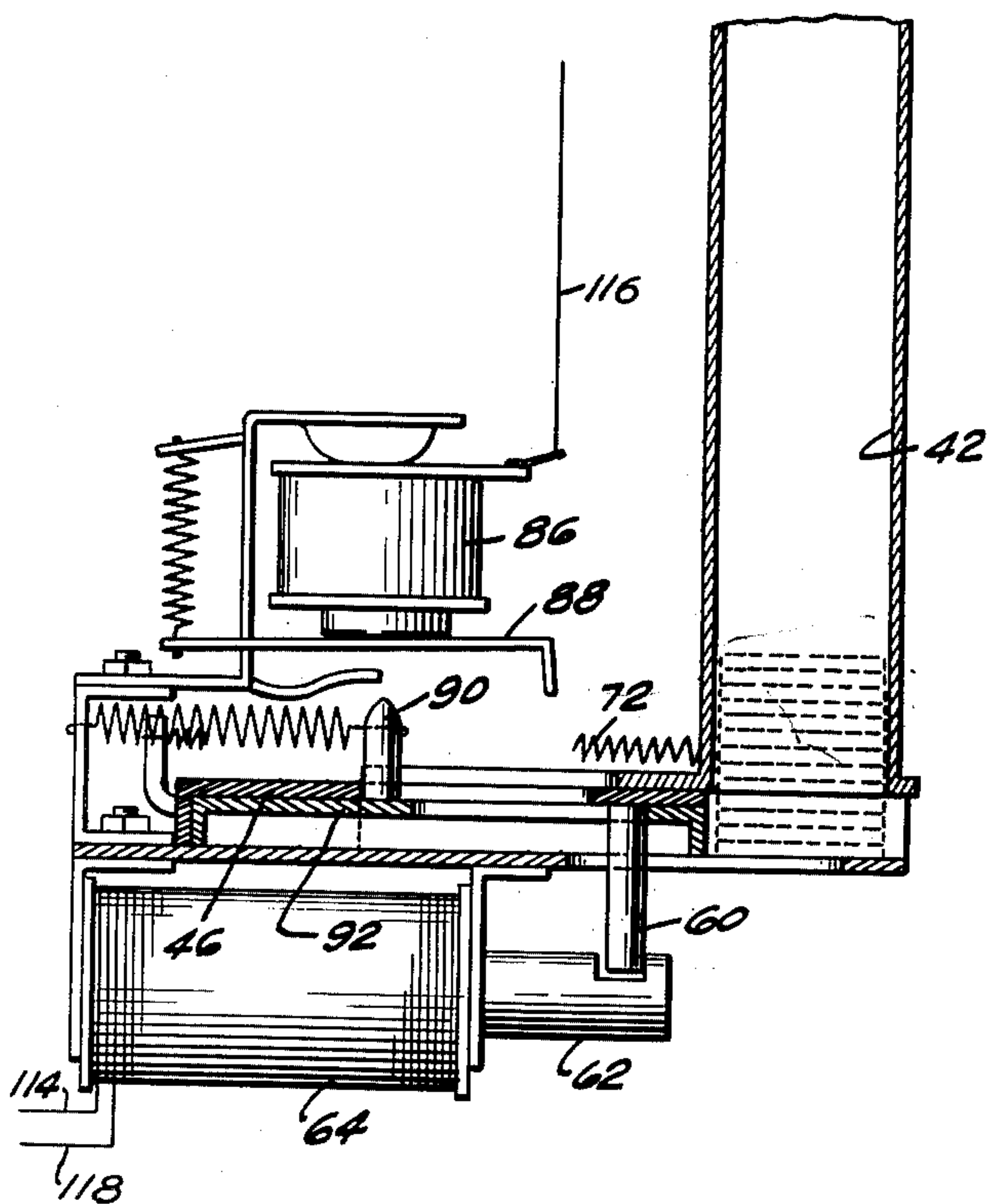


FIG. 9.

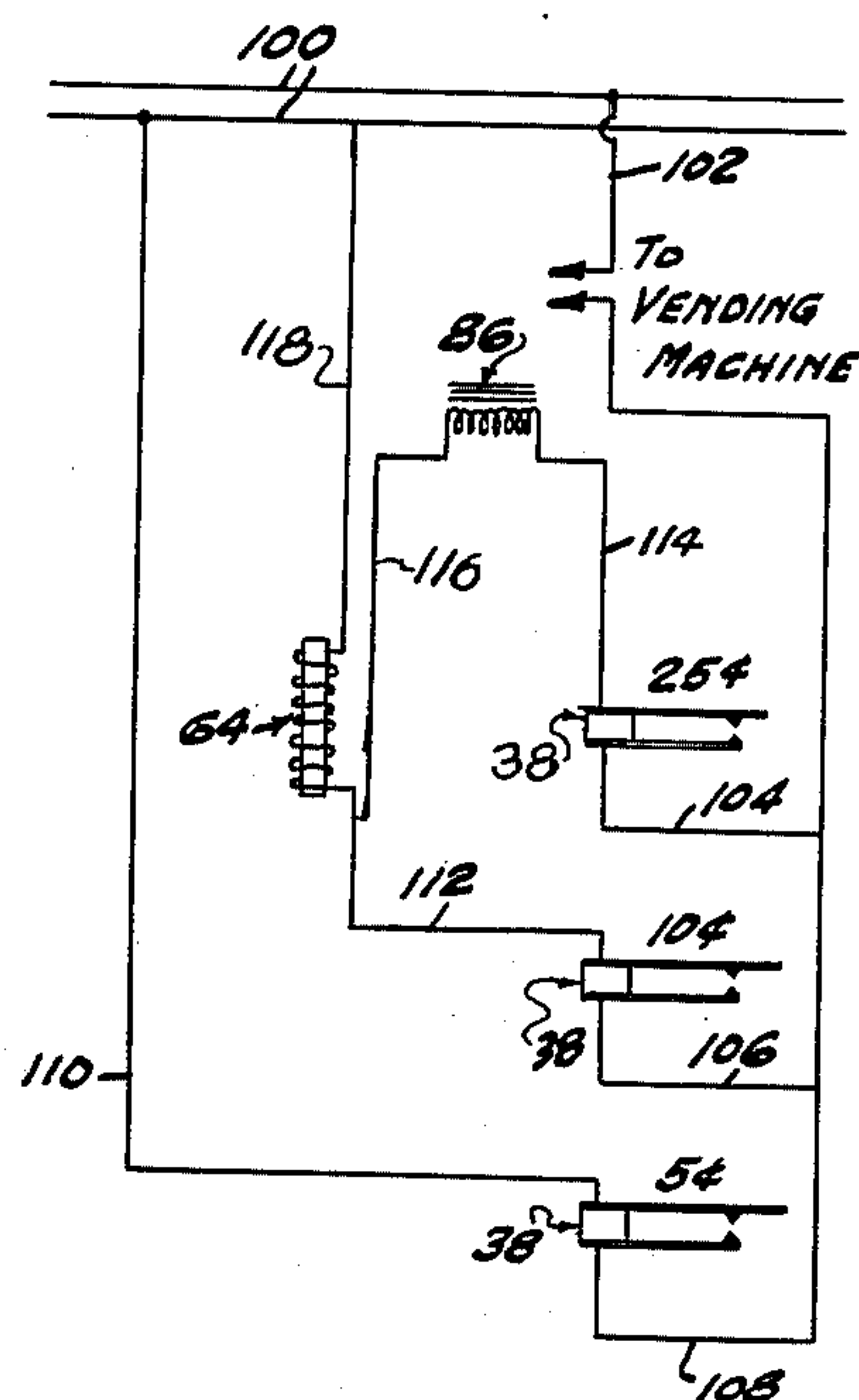


FIG. 7.

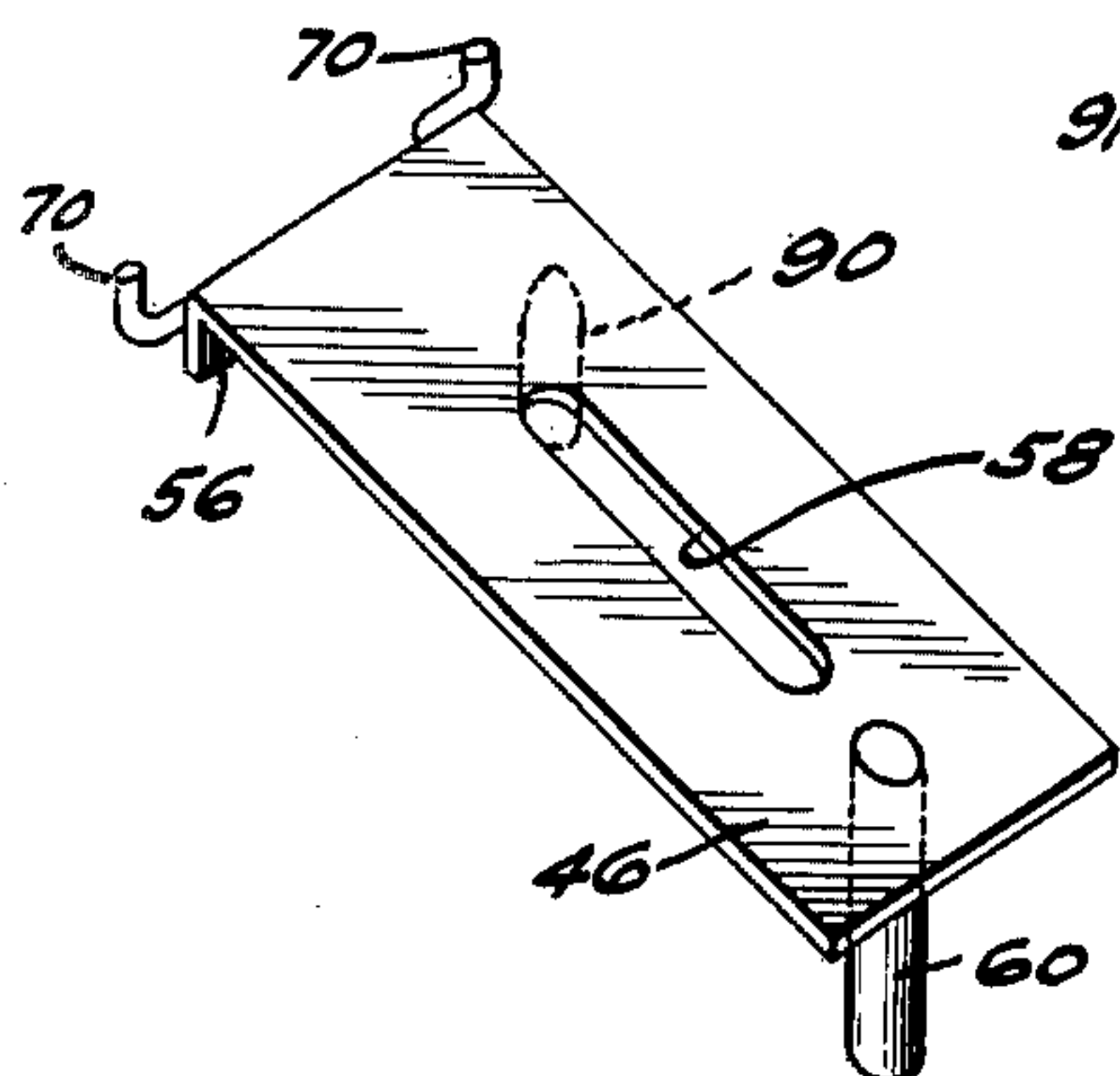
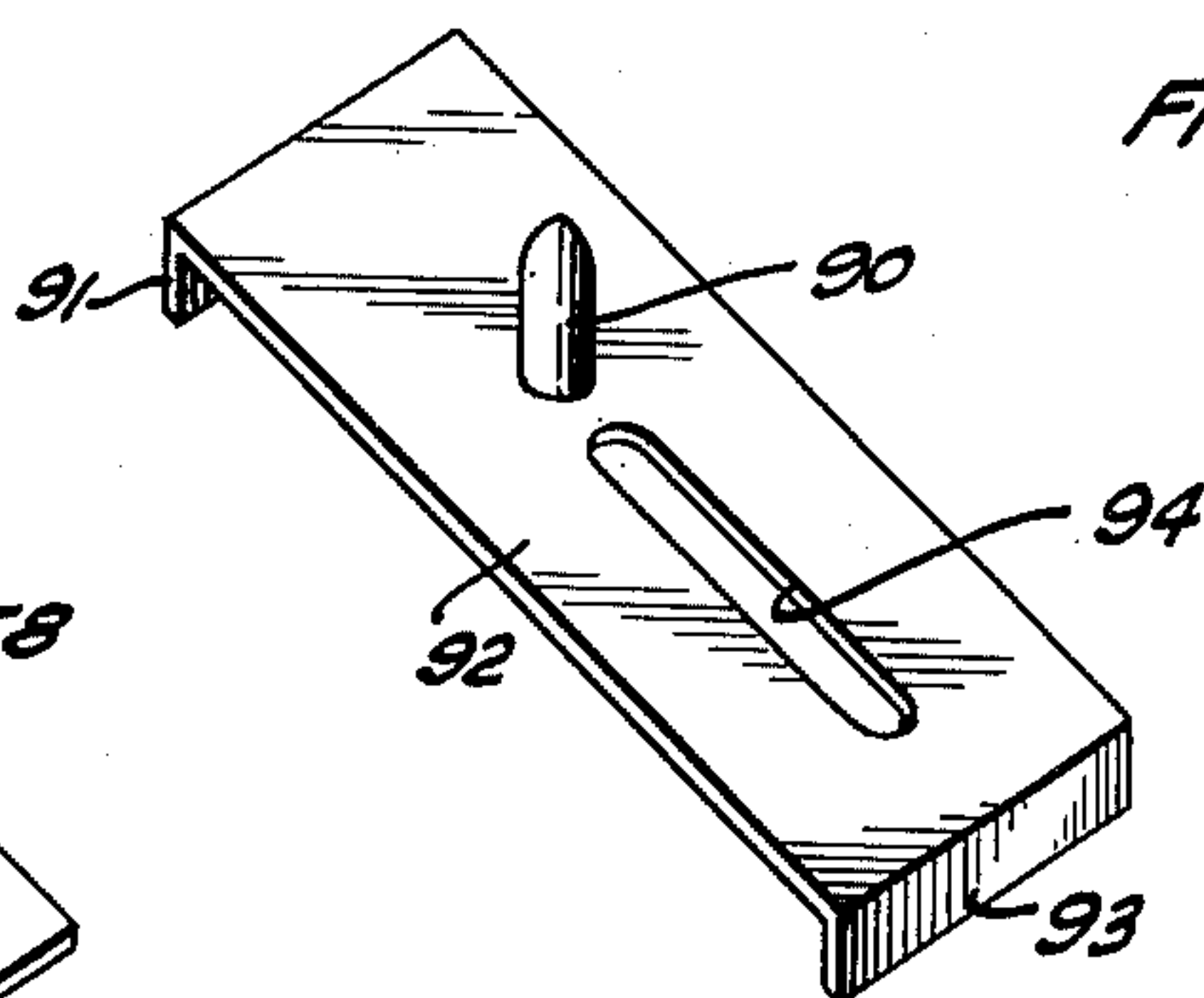


FIG. 8.



INVENTOR.
EDMUND R. MAY.
BY
Harry H. Hitzeman
ATTORNEY.

UNITED STATES PATENT OFFICE

2,629,477

COIN CHANGER AND COIN CONTROL
DEVICEEdmund R. May, Lincolnwood, Ill., assignor to
Sam May, Chicago, Ill.

Application December 2, 1946, Serial No. 713,475

5 Claims. (Cl. 194—10)

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My invention relates to improvements in coin changing and coin control devices and devices of a similar nature.

My invention relates more particularly to the adaptation with coin control devices of mechanism for making change automatically.

The general object of the invention is to provide a mechanism of the type described adapted to be operatively connected to any type of vending apparatus and designed for the insertion of a coin equal to or in excess of the price of the commodity to be vended which, upon the insertion of such coin, actuates a vending device to deliver the commodity and if the value of the inserted coin is more than the price of the commodity releases the exact change.

A further object of the present invention is to provide a coin changing mechanism adaptable for use either with a vending machine whereby a commodity is delivered and change is made or equally adapted to be used solely for the purpose of making change.

A further object of the invention is to provide mechanism of the type described which will automatically release and deliver in change either one or more coins, the mechanism for this purpose being controlled by the value and/or size of the coin originally inserted into the machine.

A further object of the invention is to provide a coin change-making mechanism of the type described that is automatically actuated upon the insertion of a coin to deliver either one or several coins in change, the delivery of more than one coin being affected by the same mechanism that is employed to deliver only a single coin.

A further object of the invention is to provide a mechanism of the type described wherein, when a plurality of coins are delivered in change, the time consumed in the operation of the mechanism is the same as when only one coin is delivered.

A further object of the invention is to provide mechanism of the type described wherein, by reason of the fact that a single mechanism operates to deliver either one or more coins in change, there is a resultant minimization of the number of parts required in the construction of the mechanism thereby effecting both a saving in time and material in constructing the mechanism as well as important space either in the vending machine to which the coin control mechanism is attached or in the size of the complete

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mechanism where it is used as a change maker exclusively.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying drawings upon which:

Fig. 1 is a side perspective view of a unit embodying my invention;

Fig. 2 is a cross sectional view therethrough taken generally on the line 2—2 of Fig. 1;

Fig. 3 is a fragmentary vertical cross sectional view through the mechanism which forms the subject matter of this invention;

Fig. 4 is a similar fragmentary view with the parts in a changed position showing the coin ejector plates moving four coins outwardly as in a change-making operation;

Fig. 5 is a front elevational view of the parts shown in Fig. 3;

Fig. 6 is a bottom view thereof;

Figs. 7 and 8 are front perspective views of the coin ejector plates; and

Fig. 9 is a wiring diagram of that part of an electric circuit required.

In the embodiment of the invention which I have chosen to illustrate and describe, I have provided a cabinet 10 which may have a plurality of coin receiving openings 12, 14 and 16, the openings being of such size that nickels, dimes or quarters may be inserted in their respective openings. I also provide a lever 18 extending through an opening 20 in the side of the housing, which lever is adapted to be depressed when a coin is placed into the machine to operate the vending mechanism for the purpose of delivering a candy bar, bottle of beverage or other commodity to be vended.

Referring now more particularly to Fig. 2, in the inside of the housing 10, I provide a plurality of coin chutes 22 in which the coins descend and pass through a slug rejector 24. The particular construction of the coin chute and slug rejector is relatively unimportant in this description, since the invention resides in the mechanism previously mentioned for making change. For this reason no details of the coin chutes or slug rejector are described. Suffice it to say that if the coins are spurious the slug rejector 24 will pass them outwardly through the opening 26 and no further action will take place either in the way of making change or in operating vending mechanism which may be associated with the coin changer.

Coins that are not spurious pass downwardly from the slug rejector 24 through switches 28,

there being one switch 23 mounted below the slot in the slug rejector for the nickel, dime and quarter. Since all of these switches may be identical and operate the same only one will be described. The switch 23 may be of the usual type having a pivoted arm 30 which lies in the path of the falling coin, the arm being mounted upon a pin 32 and having an end 34 which normally separates the two contact fingers 36 of a switch 38. I provide a weight W secured below the arm 30 adjacent the pin 32 so that after the end of the arm has been swung downwardly by a coin passing through the switch and has cleared the same, the weight operates to raise the arm 30 back to normal position with the switch 38 open.

The coins which have passed through any of the three switches 23 fall into a hopper 40 positioned therebelow, the nickel switch being directly above a vertical coin chute 42 in which the nickels fall and become stacked. The other coins may descend through the chute 44 to a coin box in the lower end of the housing 10.

Coins which descend in the nickel chute 42 lie in a stack above the ejector plate 46, the plate being mounted on a base plate 48 between a pair of side frame members 50 and 52 which are spaced between the base plate 48 and the lower plate portion 54 of the coin chute 42.

The ejector plate 46, as more clearly shown in Fig. 7, may be a comparatively flat plate having a turned down end 56 and a longitudinal slot 58 therein. A pin member 60 rigidly connected to the plate 46 extends down and is engaged by the metal core 62 which operates in a solenoid 64. The solenoid 64 may be rigidly positioned between a pair of brackets 66 and 68 fastened to the lower side of the base plate 48.

I fasten a pair of pin members 70 to the turned down end 56 of the plate 46 to secure the ends of spring members 72 connected between the pins mentioned and a pair of pin members 74 positioned on the plate 54. These springs, as will be apparent, normally tend to hold the ejector plate 46 in the position shown in Fig. 3.

As will be more apparent hereinafter, when a coin is dropped through the dime slot a commodity is vended and a nickel change is ejected. This is done by reason of the energization of the coil 64 through the dime switch 23 so that the core 62 of the solenoid is drawn into the same. By reason of the pin 60, the ejector plate 46 is moved backwardly to permit a nickel to drop on the top of the second ejector plate 92. When the current is released in the solenoid 64 the spring members 72 pull the ejector plate 46 forward, forcing the nickel that is dropped outwardly through the slot 82 into a change receptacle 84.

When a quarter has been dropped into the quarter slot a commodity is vended and four nickels are returned to the purchaser. This is accomplished in the following manner: when the quarter switch 23 is tripped, in addition to energizing the solenoid 64, the electromagnet 86 is also energized causing the pivoted armature 88 to be raised to clear the pin member 90 mounted on the top of the second ejector plate 92. The coiled spring member 94 connected between the pin 90 and an arm 96 fastened on the base plate 48 pulls the second ejector plate 92 to the left (see Fig. 3) to the changed position view shown in Fig. 4, thus providing a space between the lower end of the chute 42 and the base plate 48 sufficient for four nickels to drop. As the energy is released in the solenoid 64 the spring members 72 pull both ejection

plates forward, due to the fact that the pin 90 extends upwardly through the slot 53 in the ejector plate 46. By reason of the fact that the ejector plate 92 lies below a plate 46, I have provided a slot 94 in the plate 92 through which the pin 60 travels when the nickel ejector plate 46 only is operating. The ejector plate 92 is provided with the end walls 91 and 93 to provide the desired height for the plate, it being obvious that the same could be solid, if desired.

Referring now to Fig. 9, wherein I have shown a wiring diagram including the elements necessary for the operation of the coin changer, the wires 100 may be the alternating current power lines. I provide a conduit 102 which connects through the vending machine with the conduits 104, 106 and 108 that lead to one side of the switch members 33 which are operated by the switches 23 when a coin is dropped. A conduit 110 may extend from the five cents switch 38 back to the power lines to complete the circuit. Thus, when a nickel is dropped into the vending machine, a circuit will be completed through the five cents switch 38 and the vending machine will be operated to provide the commodity to be vended.

I provide a circuit 112 leading from the ten cents switch 38 through the solenoid 64 and back to the power lines through conduit 118 to complete a circuit. Thus, when a dime is dropped in the dime slot, a dime switch will be closed to operate the vending machine and the solenoid 64 producing a vended article and a nickel in change.

I provide the conduit 114 extending from the twenty-five cents switch 38 to one side of the electromagnet 86. A conduit 116 extends from the other side of the electromagnet 86 to one side of the solenoid 64. Thus, when a quarter is dropped into the machine, the circuit will be closed through the vending machine to produce an article being vended and will energize the electromagnet 86 and solenoid 64 which are then connected in series across the power lines, the current flowing from one power line through conduit 118, solenoid 64, conduit 116, electromagnet 86, conduit 114, the twenty-five cents switch, conduit 104, the vending machine, and conduit 102 to the other power line. As previously mentioned, this will trip the pivoted armature 88 of the electromagnet 86 permitting the operation of both ejector plates as previously described to provide four nickels in change.

While I have illustrated and described a specific embodiment of the invention, it will be apparent to those skilled in the art that changes and modifications may be made in the exact details shown and I do not wish to be limited in any particular; rather what I desire to secure and protect by Letters Patent of the United States is:

1. In a change making apparatus for coin vending machines, a coin actuated mechanism adapted to receive purchase coins of different denominations and comprising a plurality of switches, each of said switches being actuated by a coin of a predetermined denomination received by said coin actuated mechanism, a magazine for holding a column of change coins having a discharge opening at its lower end within which a portion of the coin column may descend, an uppermost ejector slide reciprocable within said opening having a single coin thickness, a lowermost ejector slide reciprocable within said opening having a multiple coin thickness, said single coin slide having therein a slot of pre-

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determined length and said multiple coin slide having an upstanding pin confined for movement within said slot, first spring means acting upon said uppermost slide for maintaining it in coin ejecting and magazine column blocking position and through said slot and pin engagement for also maintaining said lowermost slide in coin ejecting position, a solenoid connected to said uppermost slide acting in opposition to said first spring means for shifting said uppermost slide to its non-blocking position whereby to permit a single coin to descend into said discharge opening to be ejected upon deenergizing of said solenoid when said first spring means restores said uppermost slide, said solenoid being connected to an energizing circuit by one of said switches when said one of said switches is actuated by a coin of one predetermined denomination to shift said uppermost slide to nonblocking position, a second spring means of force inferior to that of said first spring means disposed to urge said lowermost slide to its non-blocking position, an electromagnet and armature disposed during non-energizing to block said lowermost slide from responding to its said second spring means, said electromagnet and said solenoid being connected to said energizing circuit by another of said switches when said another of said switches is actuated by a coin of another predetermined denomination received by said coin actuated mechanism for thereby permitting said lowermost slide to be moved by its said second spring means in one direction and then by said first spring means acting through said uppermost slide in the opposite direction to complete a reciprocation cycle in unison with said uppermost slide.

2. In a change making apparatus for coin operated vending machines, a coin actuated mechanism adapted to receive coins of different denominations and comprising a plurality of switches, each of said switches being actuated by a coin of a predetermined denomination received by said coin actuated mechanism, a magazine for holding a column of change coins, a pair of ejector slides superposed one above the other and located beneath said column, an upstanding pin in the lower of said slides extending into a slot in the upper of said slides, spring means for maintaining both of said slides in coin column blocking position, spring means for urging the lower of said slides into an opposite position, a solenoid connected to the upper of said slides capable of overpowering said first mentioned spring means for moving the upper of said slides into said opposite position, said solenoid being connected to an energizing circuit by one of said switches when said one of said switches is actuated by a coin of one predetermined denomination, an armature for blocking the movement of the lower of said slides into said opposite position, and an electromagnet for withdrawing said armature and for permitting said lower of said slides to be moved with the upper of said slides, said electromagnet and said solenoid being connected to said energizing circuit by another of said switches when said another of said switches is actuated by a coin of another predetermined denomination.

3. In an apparatus for making various change dispensing operations in conjunction with coin vending machines, a coin actuated mechanism adapted to receive coins of different denominations and comprising a plurality of switches, each of said switches being actuated by a coin of a predetermined denomination received by said coin

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actuated mechanism, a magazine for holding a column of coins in vertical alignment for gravitational descent, a pair of ejector slides having different thicknesses of coins to be discharged during change making, one of said ejectors comprising an integral member having a longitudinal slot therein, the other of said slides comprising an integral member having an upstanding pin to be confined in the slot of said first mentioned slide, spring means for urging said first mentioned slide in coin blocking position, a solenoid connected to said first mentioned slide for moving said first mentioned slide in opposition to said spring to permit gravitation of change coins from said column, said solenoid being connected to an energizing circuit by one of said switches when said one of said switches is actuated by a coin of one predetermined denomination, a spring for urging said second mentioned slide into non coin blocking position when said first mentioned slide is moved by its solenoid, and electromagnet means for preventing said second mentioned slide from responding to its spring means, said electromagnet means and said solenoid being connected to said energizing circuit by another of said switches when said another of said switches is actuated by a coin of another predetermined denomination.

4. In a change making apparatus for coin operated vending machines, a hopper for holding a vertical column of coins over a discharge channel, a horizontal slide support having a drop off ledge at one end, a pair of ejector slides reciprocable within said support, one of said slides having an elongated opening and the other of said slides having a projection extending through said opening, an armature for blocking said projection in one direction, a spring for urging said projection in the direction in which it is blocked by said armature, a secondary spring for urging the other of said slides in the opposite direction, and a solenoid opposing said secondary spring for urging said other of said slides into a coin discharge permissive condition.

5. In an apparatus for making various change dispensing operations in conjunction with coin vending machines, a coin actuated mechanism adapted to receive coins of different denominations and comprising a plurality of switches, each of said switches being actuated by a coin of a predetermined denomination received by said coin actuated mechanism; a magazine for holding a column of coins in vertical alignment for gravitational descent, a pair of ejector slides having different thicknesses of coins to be discharged during change making, said ejector slides having means engageable with one another for limiting slidable movement of one ejector slide relative to the other ejector slide, spring means for urging said first mentioned slide in coin blocking position, a solenoid connected to said first mentioned slide for moving said first mentioned slide in opposition to said spring means to permit gravitation of change coins from said column, said solenoid being connected to an energizing circuit by one of said switches when said one of said switches is actuated by a coin of one predetermined denomination, a spring for urging said second mentioned slide into non coin blocking position when said first mentioned slide is moved by its solenoid, and electromagnetic means for preventing said second mentioned slide from responding to its spring, said electromagnetic means and said solenoid being connected to said energizing circuit by another of said switches

when said another of said switches is actuated by
a coin of another predetermined denomination.
EDMUND R. MAY.

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