April 27, 1965 E. A. STEIN 3,180,517

COIN-OPERATED VENDING MACHINE

Filed July 25, 1960 5 Sheets-Sheet 1

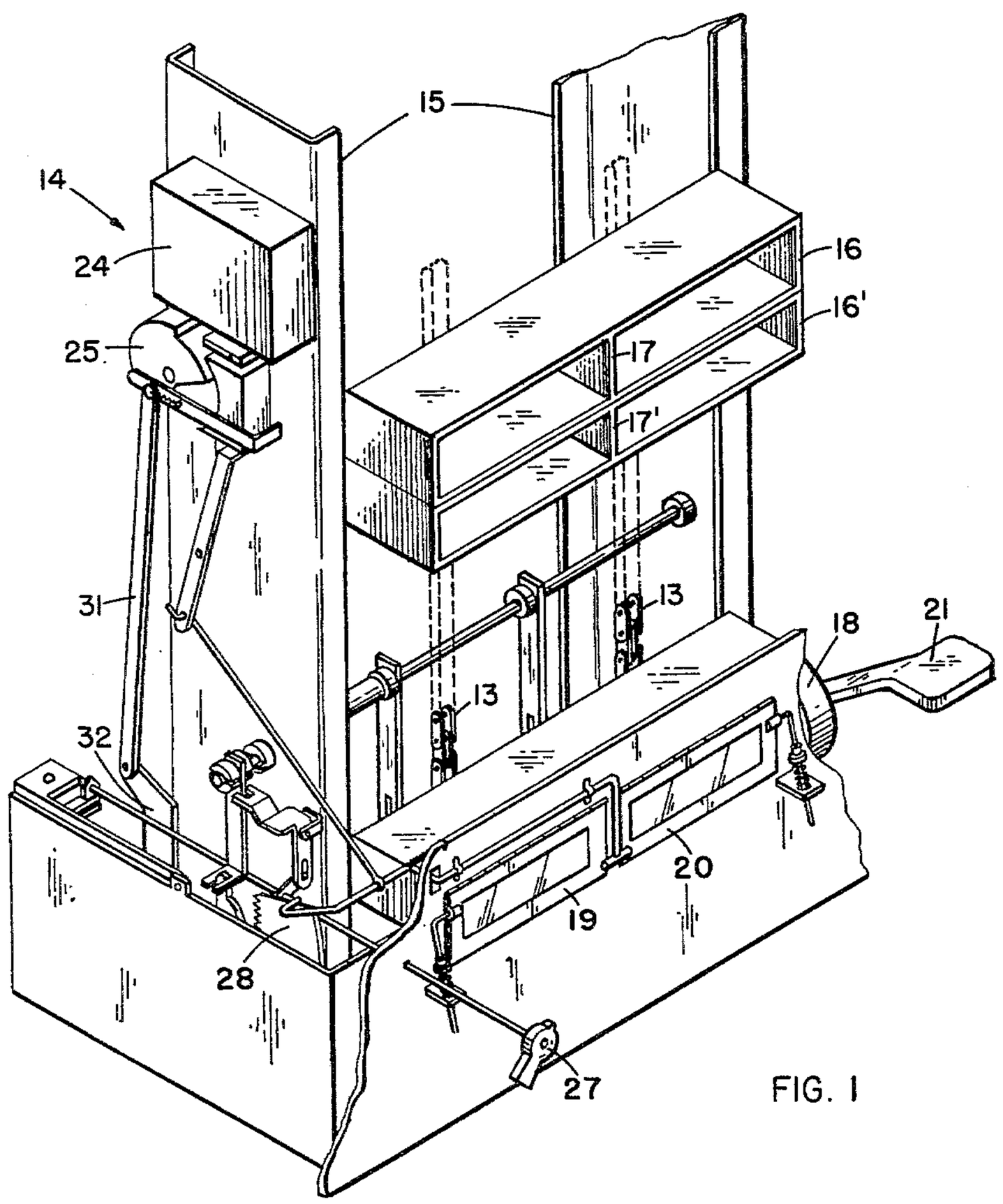

FIG. 1

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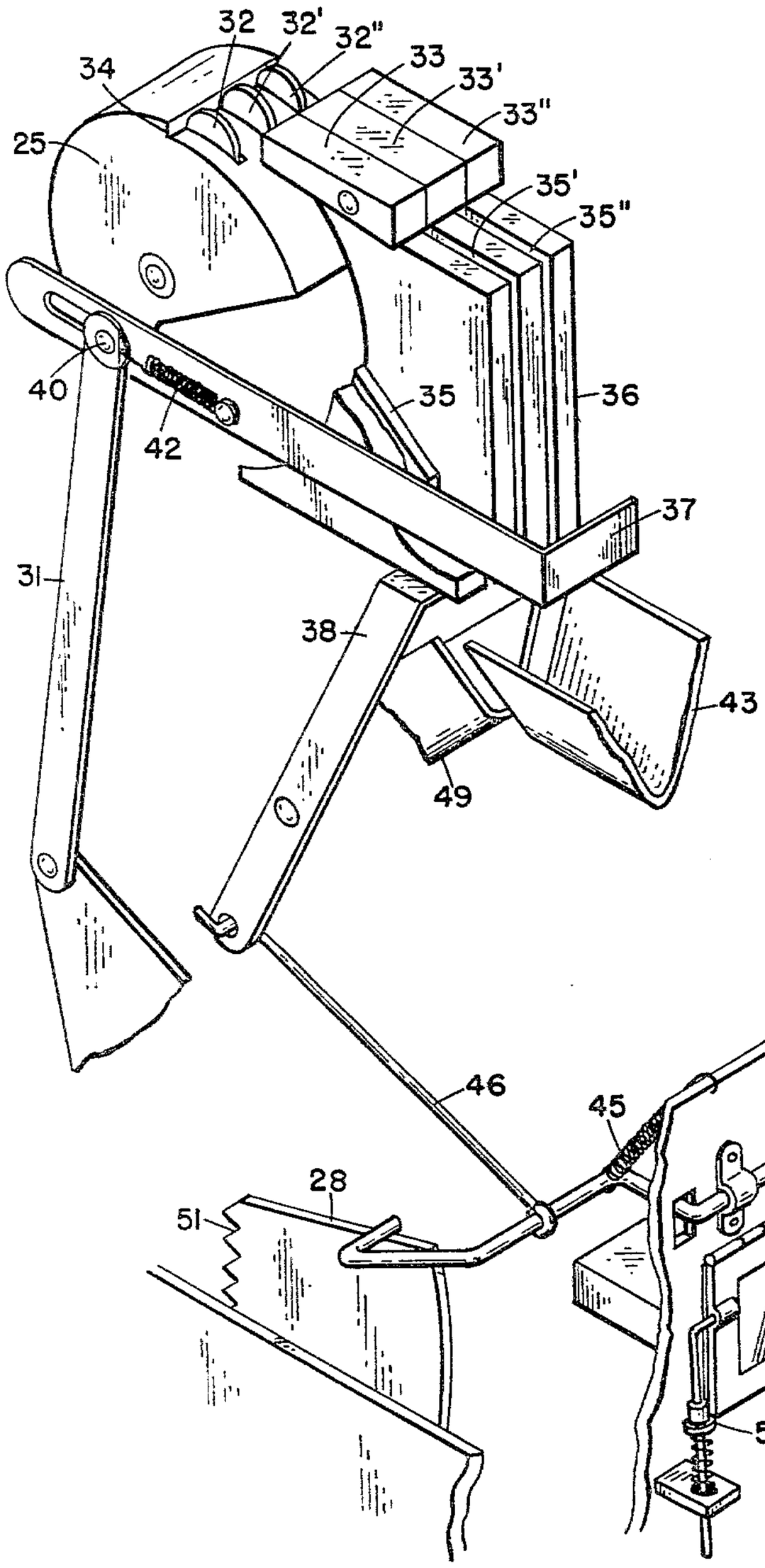

FIG. 2

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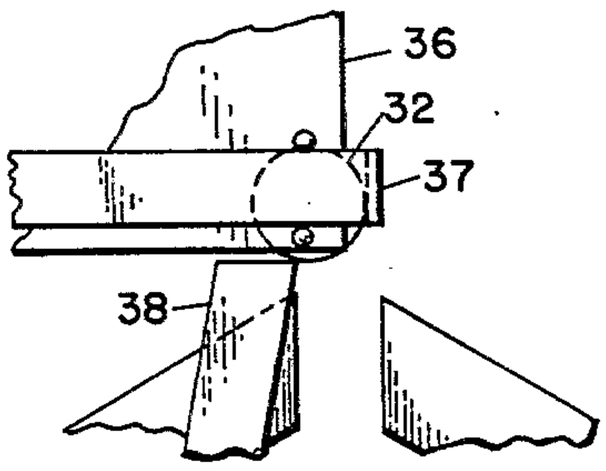

FIG. 3

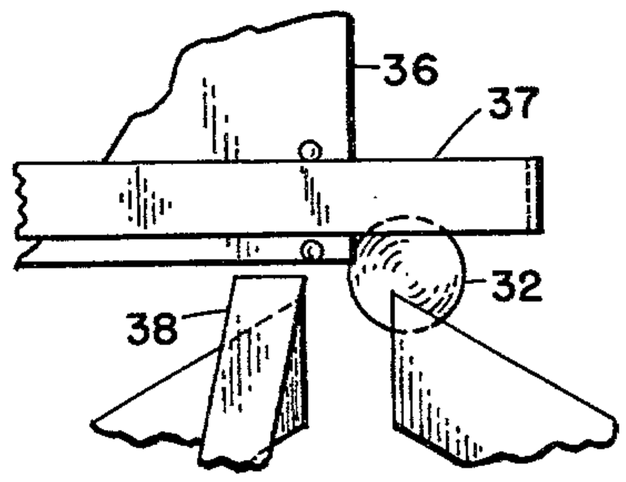

FIG. 4

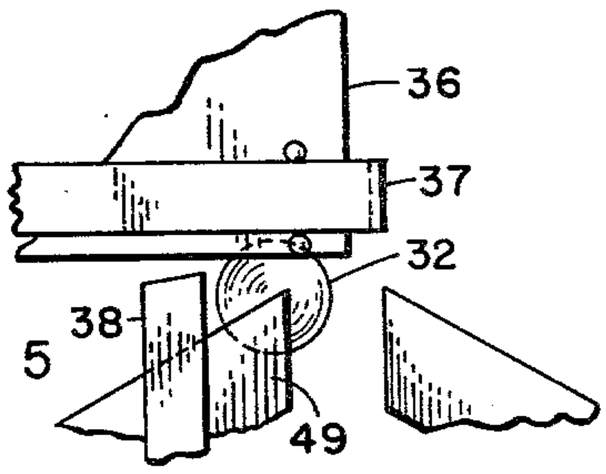

FIG. 5

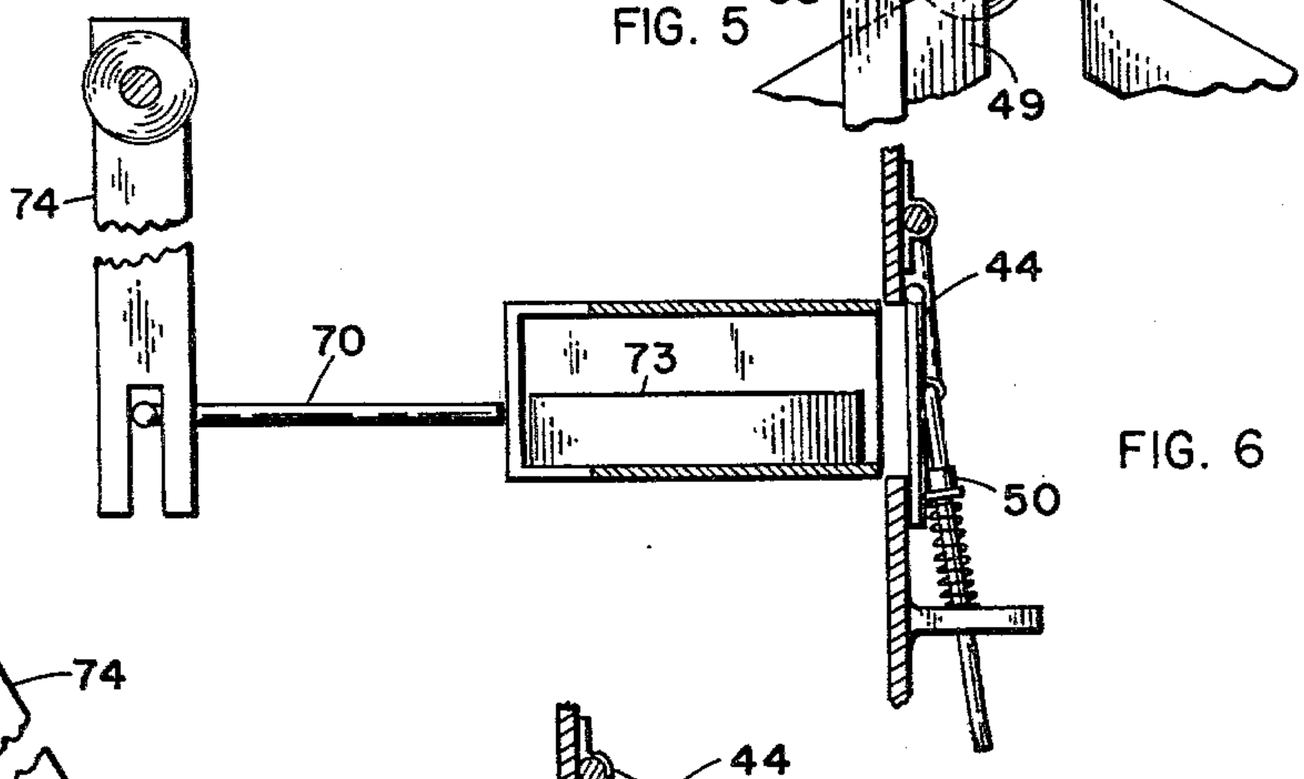

FIG. 6

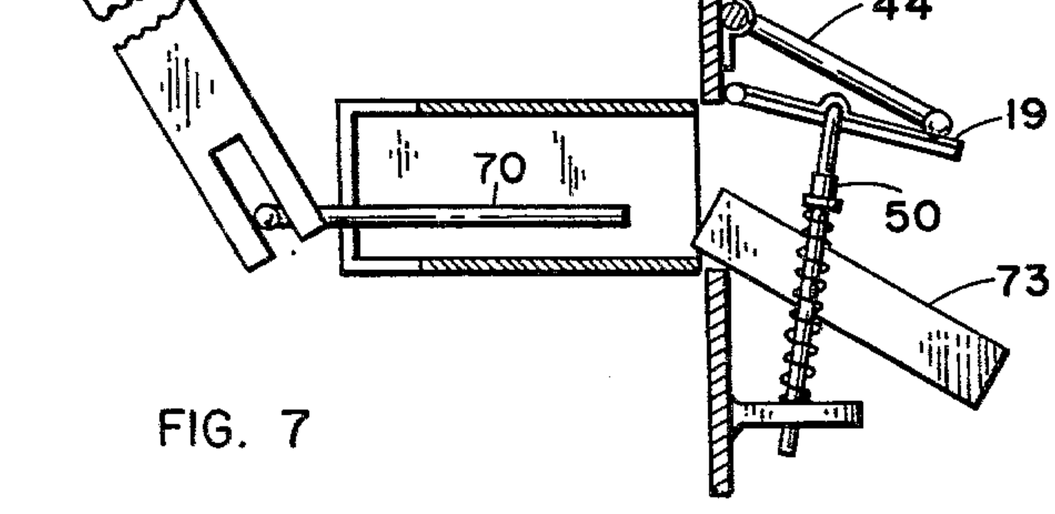

FIG. 7

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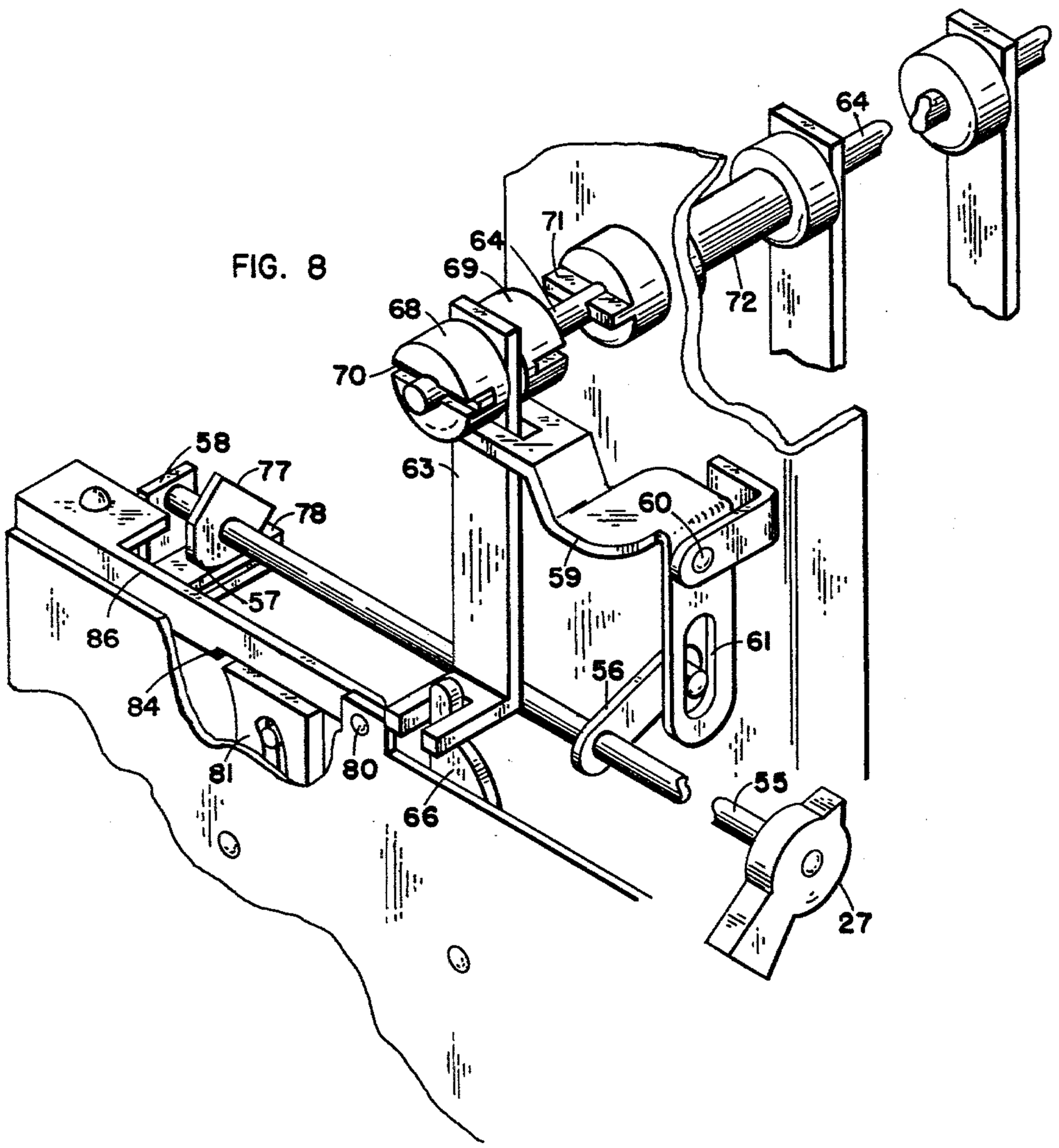
FIG. 8



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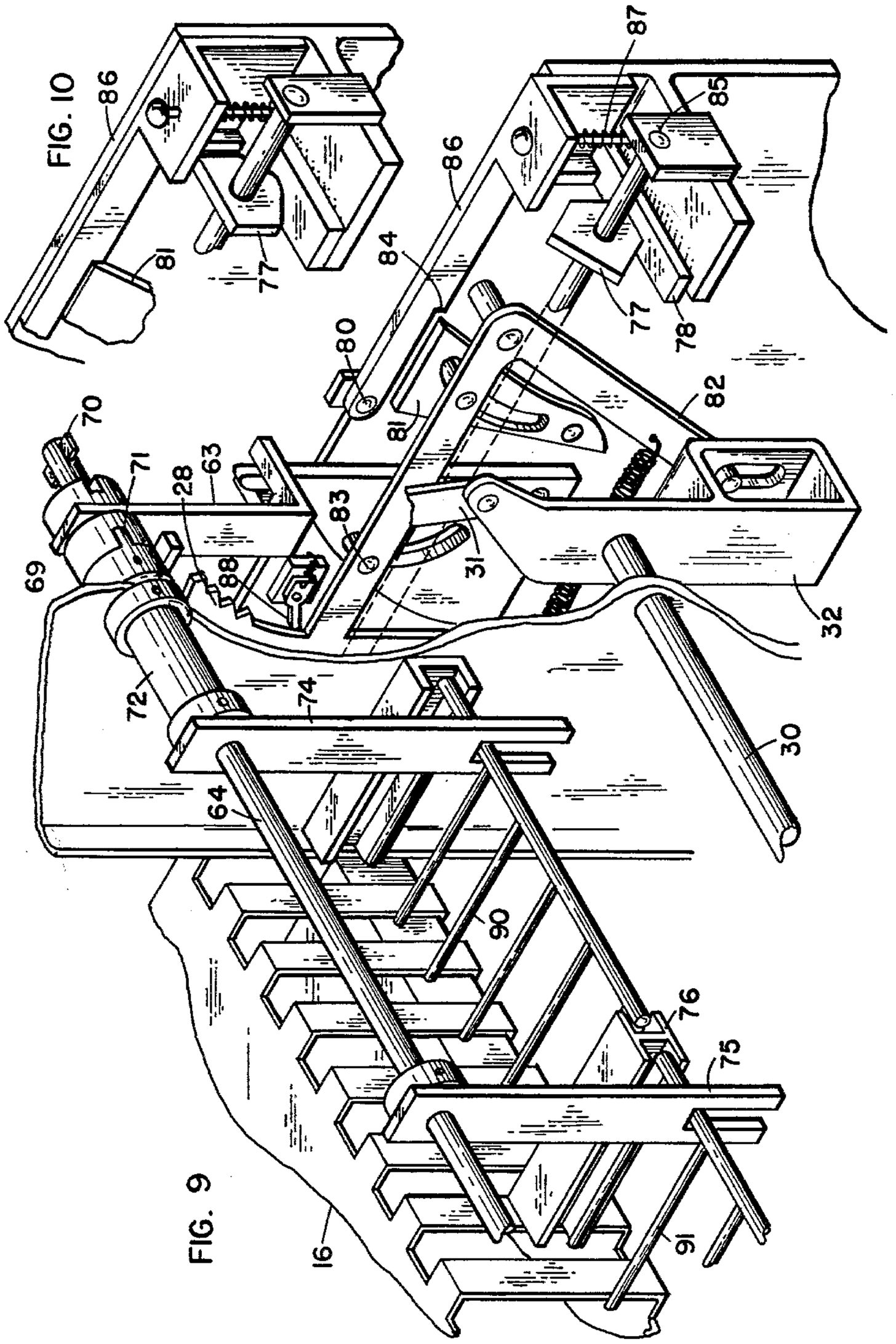

FIG. 10

FIG. 9

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COIN-OPERATED VENDING MACHINE

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Filed July 25, 1960, Ser. No. 45,161
6 Claims. (Cl. 221—5)

This invention relates to coin-operated vending machines, and more particularly relates to vending machines in which merchandise contained in compartments on movable endless conveying means can be viewed through a glass front in the vending machine and the conveyor be manually operated to position the merchandise in a preselected position adjacent to a dispensing gate through which merchandise may be dispensed. The compartment may be emptied by a purchaser manually operating a dispensing lever which opens the dispensing gate and ejects the merchandise. Such machines are widely used and offer the advantage that merchandise of many kinds and character can be dispensed from one machine, the variety of merchandise which can be loaded into the machine being limited only by the number of dispensing compartments in the machine.

The machine of this invention is provided with multiple rows of dispensing compartments disposed on one conveyor means and is provided with means for selecting and dispensing merchandise from compartments in any of the multiple rows of dispensing compartments. Heretofore coin operated vending machines of the type described have required that separate conveyor means be provided for each row of dispensing compartments and have required either that a gear shift be provided to select a particular conveyor or a movable coin mechanism be provided and switched among conveyors. In the machine of this invention a two-position rotatable manually operated knob is provided to enable selection of one of a plurality of ejection means, one of said means being associated with each row of containers on a conveyor. Further, a merchandise operated linkage to the coin box gate is provided to insure that coins are not deposited in the coin box of the machine without merchandise being dispensed from the machine.

It is an object of this invention to provide a coin-operated vending machine in which visual selection of merchandise can be made from merchandise in multiple rows of dispensing compartments on conveyor means.

It is another object of this invention to provide a coin-operated vending machine in which currency cannot be deposited in the coin box unless merchandise is dispensed from the machine.

FIGURE 1 is a perspective view of a portion of the vending machine of this invention;

FIGURE 2 is a detailed view of a portion of the machine of FIGURE 1;

FIGURE 3 is an elevation of a portion of the machine of FIGURE 2 after a coin has been deposited in the machine and before the dispensing operation is commenced;

FIGURE 4 is an elevation of the machine of FIGURE 3 in changed position wherein the coin is returned to the user of the machine by means of a coin return slot;

FIGURE 5 is an elevation of the machine of FIGURE 3 in changed position wherein a coin is admitted to the coin box by means of an article being dispensed from the machine;

FIGURE 6 is an elevation of a portion of the machine of FIGURE 1 wherein merchandise has been selected and wherein the dispensing operation has not been commenced;

FIGURE 7 is an elevation of the machine of FIGURE

6 in changed position wherein dispensing of the merchandise is accomplished;

FIGURE 8 is a perspective view of a portion of the machine of FIGURE 1 in cutaway illustrating coaxial means for selecting one row of compartments from which to dispense merchandise;

FIGURE 9 is a perspective view of a portion of the machine of FIGURE 1 showing the selecting means of FIGURE 8 in changed position.

Referring now to FIGURE 1 there is shown a vending machine 14 comprising upright chassis members 15 in which axles, pulleys and sprockets for supporting vertical conveyor belts 13 are provided but are not shown for the sake of simplicity. Merchandise racks 16 and 16' are divided by dividers 17 and 17' to provide two vertical rows of dispensing compartments in machine 14. Racks 16 and 16' are affixed to the endless vertical conveyor belts 13 in operable manner. Compartmented racks identical to 16 and 16' are disposed above and below racks 16 and 16' to provide two continuous rows of compartments on conveyor means 13 which can be vertically transported by means of wheel 18 being manually turned by an operator of the machine. When rack compartment 16 or 16' is positioned adjacent to dispensing gates 19 and 20, dispensing handle 21 can be depressed to operably dispense merchandise from rack 16 or 16', as the case may be, through gate 19 or 20 to become available to the operator.

Handle 21 can be operated only after suitable coins have been deposited in coin selecting means 24 in which the coins are accepted or rejected on the basis of size and weight in any manner which is operable and which is conventional in coin operated vending machine art.

Coins that are deposited in selector 24 fall by gravity into rotary coin mechanism 25 and there come to rest until rotary coin mechanism 25 is rotated by means of handle 21 in a manner which will hereinafter be described. The machine operator may select merchandise in either row of compartments by turning indicator knob 27 either to the right, as shown, or to the left. Indicator knob 27 is a two-positioned indicator which will cause the machine to be inoperable if not properly positioned.

To operate machine 14 an operator selects merchandise to be vended by turning wheel 18 until the compartment containing the merchandise is adjacent to window 19 or 20, as the case may be, and inserts coins of correct denomination into sorting machanism 24. Handle 21 may then be depressed. Handle 21 is fixedly attached to rod 30 (FIGURE 9) and sector gear 28 is rotated downward while push rod 31 is lifted by pivotal connection to member 32 on rod 30. Rotary coin mechanism 25 is rotatively actuated by movement of push rod 31 and coins 32, 32' and 32'' disposed in coin mechanism 25 as shown in FIGURE 2 after having been received by coin selector 24 engage detents 33, 33' and 33'' in operable manner so as to lift them out of contact with coin mechanism 25. If coins 32, 32' and 32'' are not operably placed in coin mechanism 25 shoulder 34 thereof contacts detents 33, 33' and 33'' thereby obstructing further rotation of coin mechanism 25 and preventing the dispensing operation from being continued. After coins 32, 32' and 32'' have operably engaged and lifted detents 33, 33' and 33'' and have passed thereunder they fall from their positions in rotary coin mechanism 25 into slots 35, 35' and 35'' of coin gate mechanism 36 and come to rest against coin return gate 37 and coin box gate 38 in the position shown in FIGURE 3. When rotary coin mechanism 25 is rotated sufficiently to enable coins 32, 32' and 32'' to fall into slots 35, 35' and 35'' of coin gate mechanism 36, coin return gate 37 has been moved into juxtaposition with

coin gate mechanism 36 by pivot member 40 on push rod 31 engaging the end most extremity of its range of movement in coin gate 37 and causing coin return gate 37 to be moved from the position shown in FIGURE 2 to the position shown in FIGURE 3 adjacent coin gate mechanism 36. Rotation of coin mechanism 25 is completed, and upon return movement, spring 42 affixed to coin gate 37 and to pivot 40 returns coin return gate 37 to open position as shown in FIGURE 4. Thus, if merchandise is not dispensed from machine 14 coins 32, 32′ and 32″ are released from coin gate mechanism 36 into coin return chute 43 where they are returned to the operator of the machine.

If merchandise is operably dispensed by machine 14 by depressing handle 21, merchandise gate 19 or 20 will be pushed open by merchandise being pressed thereagainst from within the machine thereby opening the merchandise gate 19 or 20, as the case may be.

Gate stop 44 prevents merchandise gate 19 or 20 from being opened when sector gear 28 is in raised position as shown in FIGURE 2. When sector gear 28 is depressed by actuation of handle 21 merchandise gates 19 and 20 are enabled to be opened against the tension of spring 45. Rod 46 moves the lower end of coin box gate 38 forward and frees coins 32, 32′ and 32″ in coin gate mechanism 36 to fall into coin box chute 49 as shown in FIGURE 5. Thus, coins which are deposited in machine 14 are enabled to enter the coin box only if merchandise is dispensed from the machine by merchandise gate 19 or 20 being opened by merchandise being dispensed therethrough. It is to be understood that merchandise gates 19 and 20 are not accessible to an operator so they can not be manually opened. They are disposed adjacent a dispensing chute into which merchandise drops and is delivered by gravity to the front of the machine. It is to be understood that coins will be returned to an operator if the selected merchandise compartment of the machine is empty or if the machine malfunctions or jams for whatever reason. Coins will be accepted into the coin box of the machine only when merchandise is delivered.

Door spring 50 is provided on each merchandise door 19 and 20 to insure positive closing and positive opening of the doors and prevents merchandise from being lodged between a half opened door and the frame of the machine. To insure that the dispensing cycle is completed after handle 21 is initially depressed teeth 51 on sector gear 28 are provided to act cooperatively with detent 88 (FIGURE 9) in well-known manner to prevent sector gear 28 from being returned to raised position until the dispensing cycle is completed thereby insuring proper operation of machine 14.

Merchandise selector

Referring now to FIGURE 8, indicator knob 27 is shown in right hand position thereby enabling selection of merchandise to be made from the right hand row of compartments on conveyor belt 13 (FIGURE 1). Indicator knob 27 is affixed to shaft 55 to which member 56 and cam lobe 57 are fixedly attached. Shaft 55 is supported in bearing 58 adjacent to cam lobe 57. Rotation of indicator knob 27 causes bifurcate member 59 to be rotated about pivot 60 by member 56 acting in slot 61 of bifurcate member 59 as shown. Movement of bifurcate member 59 by rotation of indicator knob 27 causes shift lever 63 to be laterally moved along shaft 64. Shift lever 63 is operably engaged with member 66 in either extreme right or left position. Split collars 68 and 69 are permanently affixed to shift lever 63 and operably engage respectively radius pins 70 affixed to shaft 64 and radius pins 71 affixed to tube 72 coaxially disposed with shaft 64. Shaft 64 and tube 72 are mounted by suitable bearing and bushing means in a conventional manner. When shift lever 63 is disposed to the left in FIGURE 8 by rotation of indicator knob 27 to the right radius pins 70 on shaft 64 are engaged by split collar 68. Dispensing rake 91 disposed behind the left hand row of compartments of FIGURE 9 may then be actuated. When shift lever 63 is disposed to the right as shown in FIGURE 9 pins 71 on coaxial tube 72 are engaged by split collar 69. Dispensing rake 90 associated with the right hand row of compartments of FIGURE 9 may be actuated.

Merchandise may be contacted by rake 90 in the left hand row of dispensing compartment or by rake 91 in the right hand row of compartments on conveyor 13. Rake 90 or 91 may be brought into contact with merchandise 73 (FIGURE 6) in a compartment by rotation of arm 74 or arm 75 respectively, rake 90 or 91 being operably moved along channel members 76 forwardly to the position shown in FIGURE 7 wherein merchandise 73 causes gate 19 or 20 to be opened thereby enabling merchandise 73 to drop therefrom into a dispensing chute to be delivered to the front of the machine. Arms 74 and 75 are fixedly attached to tube 72 and to shaft 64 respectively.

When shift lever 63 is traversed laterally by rotation of indicator knob 27 an interlock mechanism prevents movement of member 66 from being made; thus, if shift lever 63 were actuated while collars 68 and 69 on lever 63 were both unengaged the coins deposited in the machine would be returned to the operator in the manner heretofore described. The interlock mechanism is provided to prevent operation of the machine while shift lever 63 is inoperatively disposed. The interlock mechanism is comprised with shoulder 84 on cam follower 86 being engageably disposed with member 81. Cam follower 86 is biased by spring means 87 (FIGURE 9) about pivot 80, and is configured with shoulder 84 against which interlock member 81 abuts when cam follower 86 is depressed by the lobe of cam 77 as occurs when indicator knob 27 is intermediately disposed between predetermined positions. Interlock member 81 is reciprocated by movement of radius arm 82 so that radius arm 82 and sector gear 28 becomes immobile when cam follower 86 is depressed as shown in FIGURE 10.

As will be apparent, the operative dispensing mechanism of the machine of this invention has incorporated thereinto the article of merchandise being dispensed. If the article is improperly placed or is absent, the machine cannot be operated, and coins cannot be delivered to the coin box of the machine. The provision of an interlock mechanism which is operative when the machine components are improperly positioned further prevents improper operation of the machine thereby making it virtually impossible to have money retained in the machine without merchandise being delivered.

While certain modifications and embodiments of the invention have been described, it is of course to be understood that there are a great number of variations which will suggest themselves to anyone familiar with the subject matter thereof and it is to be distinctly understood that this invention should not be limited except by such limitations as are clearly imposed in the appended claims.

I claim:

1. In a coin controlled merchandise vending machine, merchandise selecting and dispensing apparatus comprising in combination an actuating lever, said lever being operable to reciprocally move a reciprocally movable means engageable with a plurality of concentric shafts having coincident axes, each of said shafts having connected thereto means for delivering merchandise from said machine by rotational movement of said shaft, said means for delivering merchandise comprising a reciprocally movable cantilever remotely disposed from merchandise to be dispensed and biasable into contact therewith, said engageable means being actuated by an operator of the machine manually selecting one of a plurality of predetermined positions of an indicator knob

on said machine, said indicator knob being biasable for engaging said engageable means with members of said plurality of shafts to spring biasing means for registering said indicator knob in said predetermined position.

2. The article of claim 1 wherein said spring biasing means is comprised of a cam rigidly connected to said indicator knob and a cam follower spring biased into operable connection with said cam, said cam follower when displaced by movement of said indicator knob engaging a fixed stop member thereby limiting movement of said cam follower.

3. The article of claim 2 wherein a toothed sector gear operably connected to said lever and disposed operably adjacent a detent prevents said lever from being returned to unactuated position before said sector gear is fully actuated.

4. In coin-controlled vending machine, dispensing apparatus comprising in combination an actuable lever, a plurality of concentric, coaxial, coincident shafts, means for manually selecting one of said shafts to be actuated, connecting means between said lever and said means for selecting a shaft to be actuated to provide operable actuation of a selected shaft by movement of said lever, dispensing means operably actuated by said shafts, each said dispensing means being biasable by only one of said shafts into contact with selected merchandise to be dispensed.

5. The article of claim 4 wherein each of said shafts is operably connected to means for delivering merchandise from said machine.

6. In coin-controlled vending machine, means for selecting merchandise in adjacent rows comprising in combination a visible indicator knob, spring biased cam follower means, and a cam operably connected to said indicator knob, said indicator knob having predetermined operable positions, registry of said indicator knob in predetermined position being made by being biased by manual operation so as to rotate said cam until a lobe of said cam is disposed adjacent said cam follower thereby displacing said cam follower from spring biased position into a position obstructing movement of the merchandise dispensing apparatus of said machine, spring loading of said cam follower causing said cam to be further rotated until said cam follower is returned to undisplaced position thereby providing said registry.

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