March 27, 1951 C. GABRIELSEN 2,546,690

COIN-CONTROLLED ELECTRICAL VENDING MACHINE

Filed April 6, 1948 9 Sheets-Sheet 1

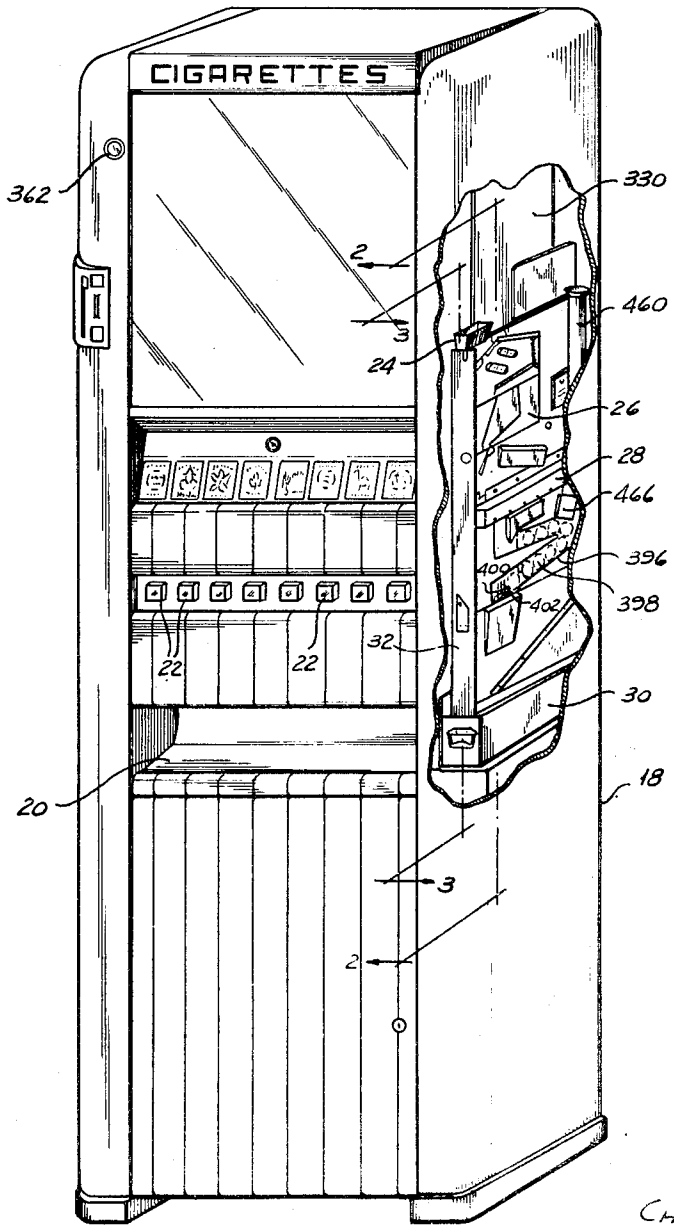


Fig 1

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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 2

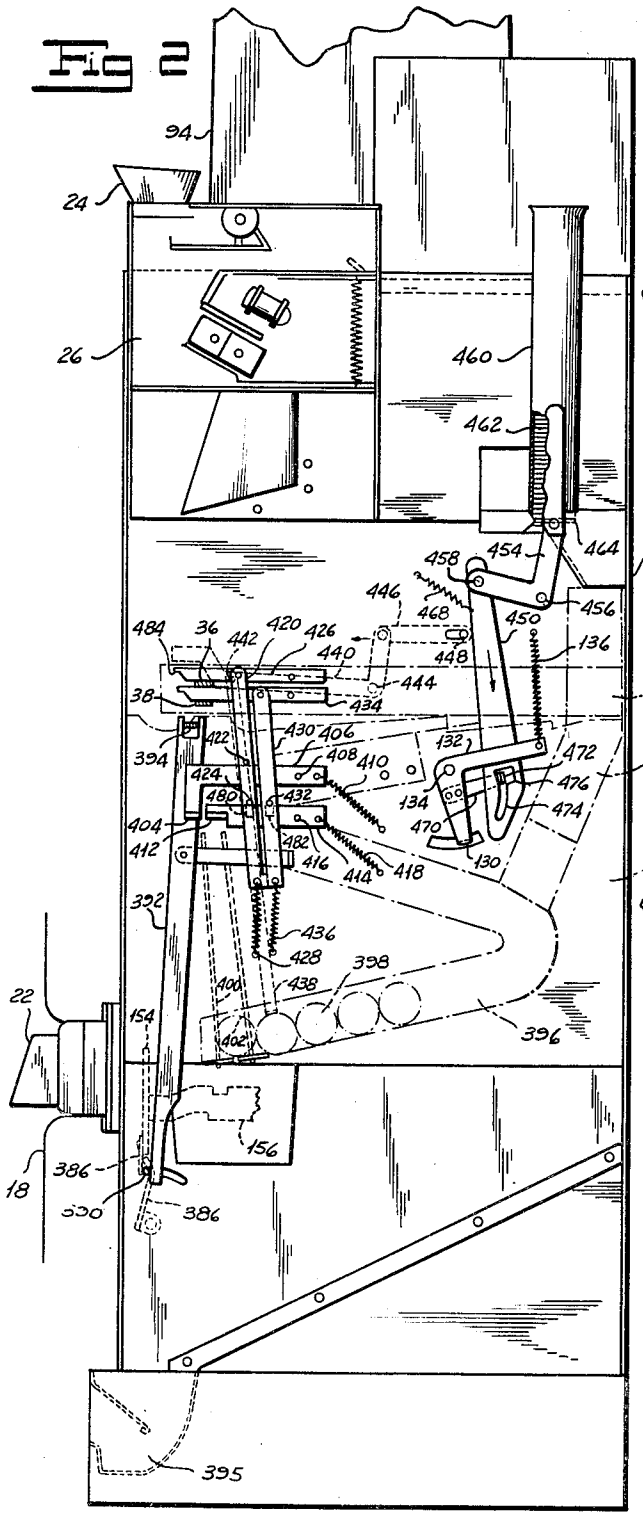


Fig 12

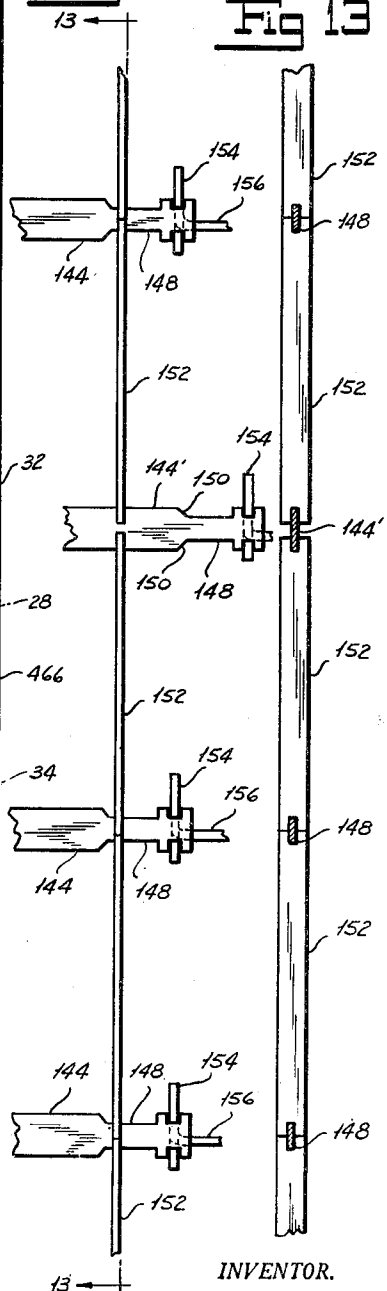


Fig 13

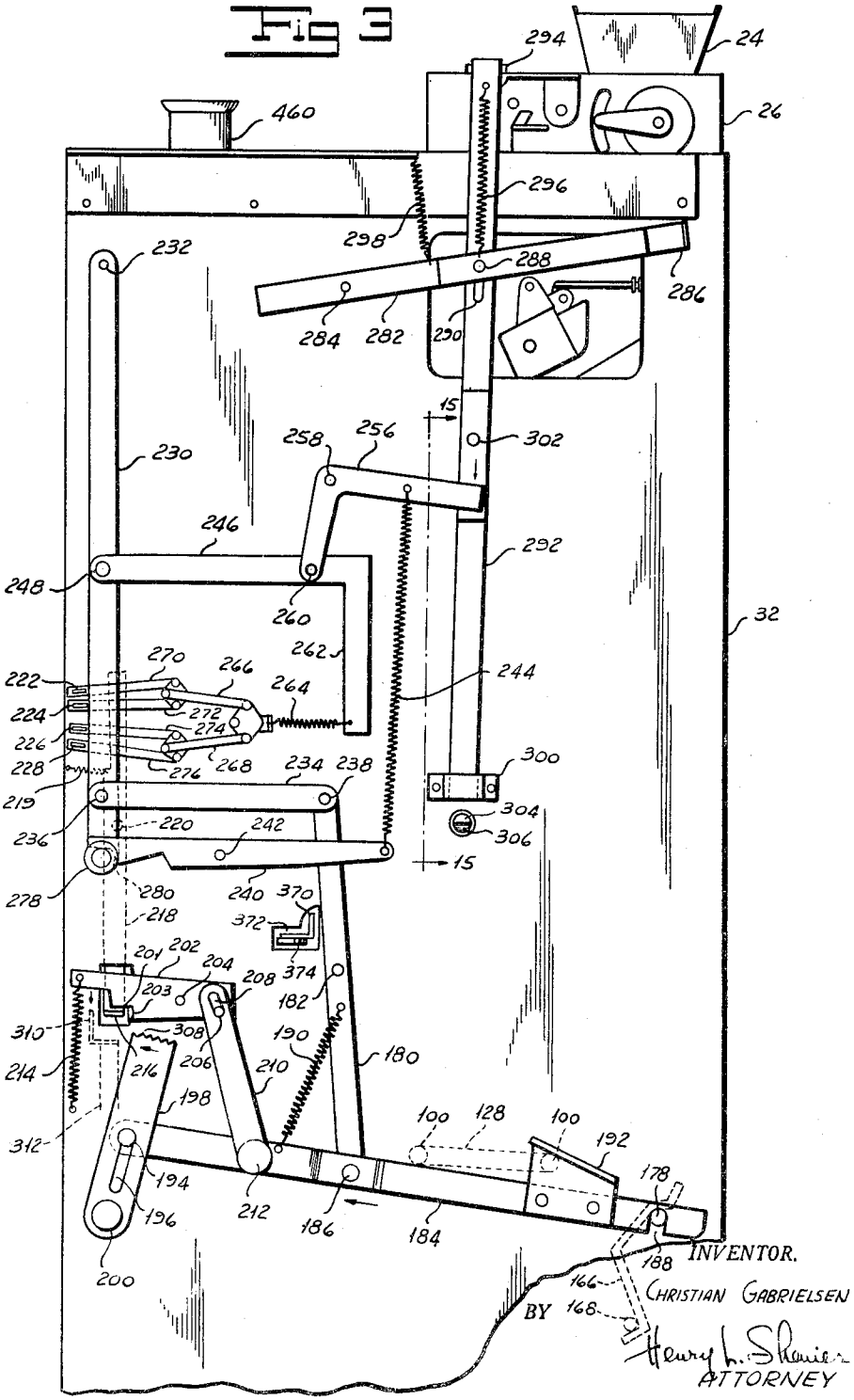
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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 3

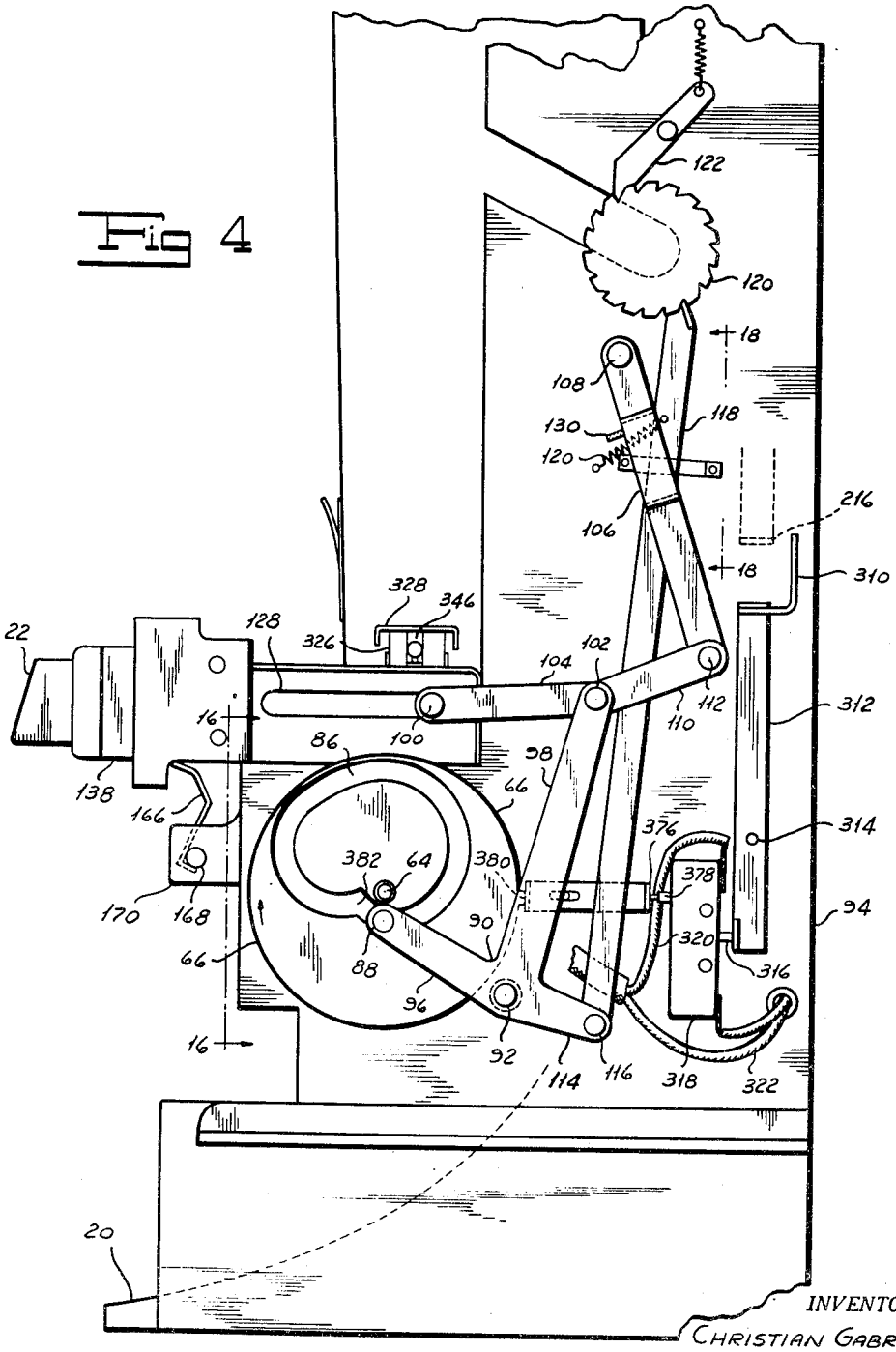


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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 4



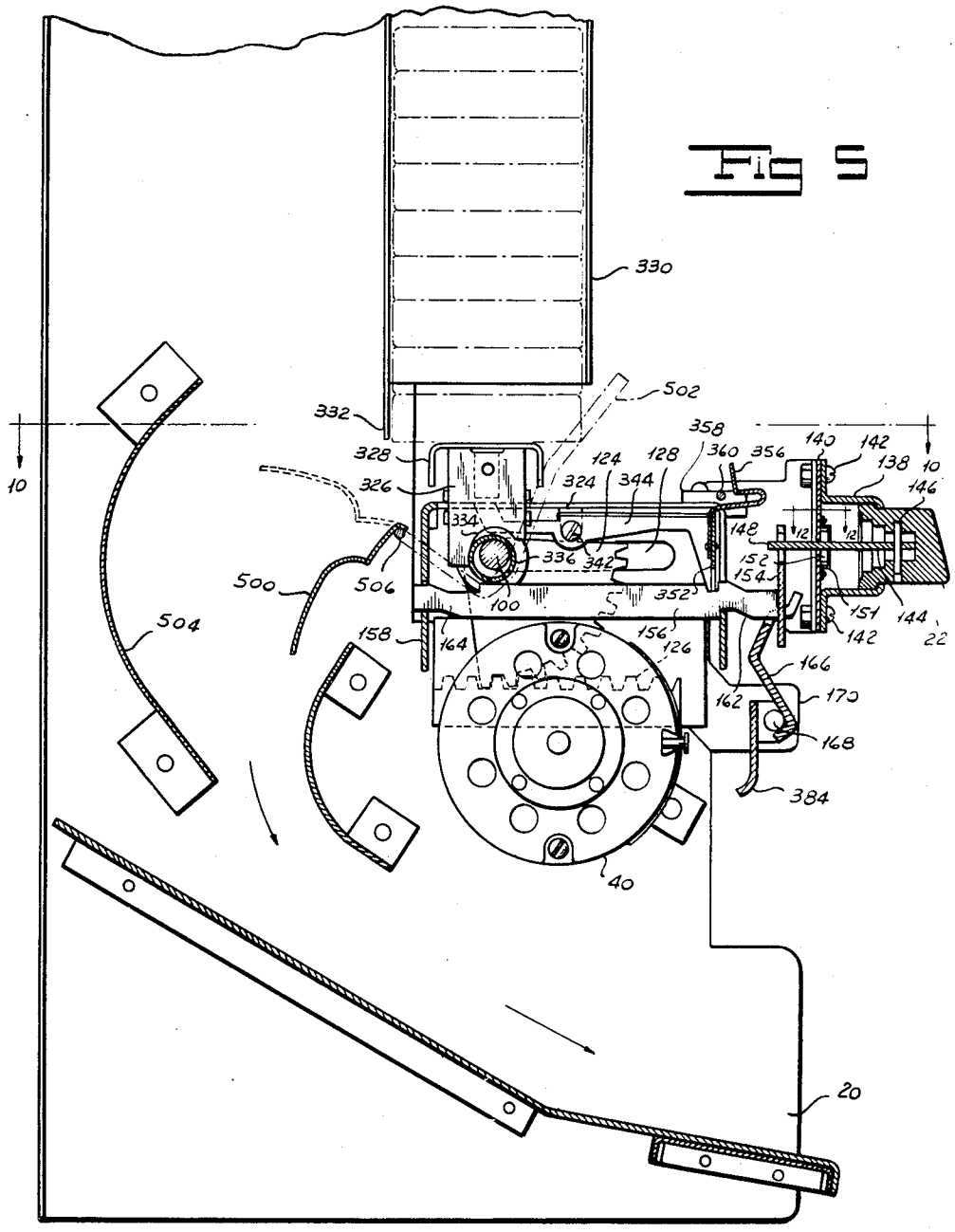
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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 5



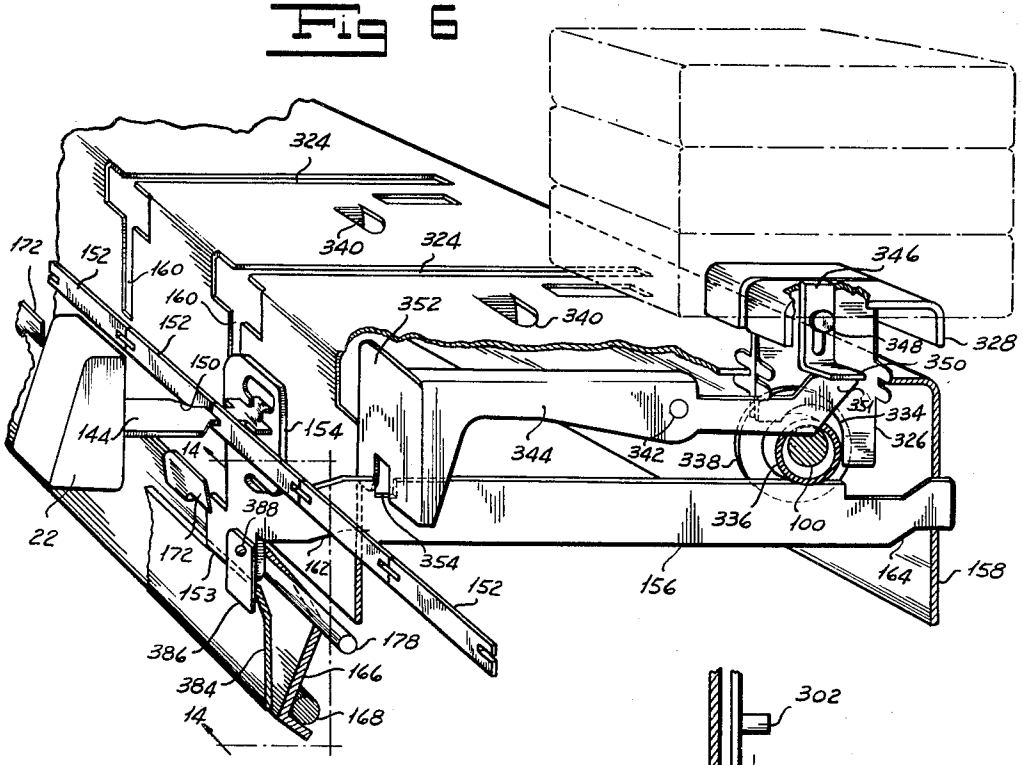
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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 6



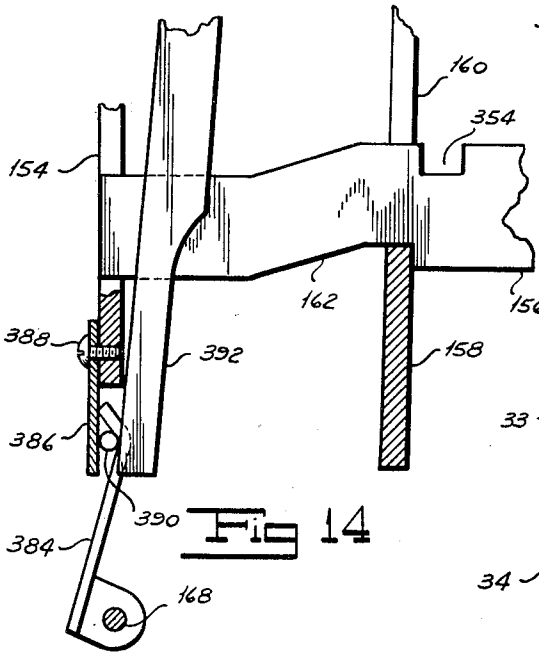


Fig 14

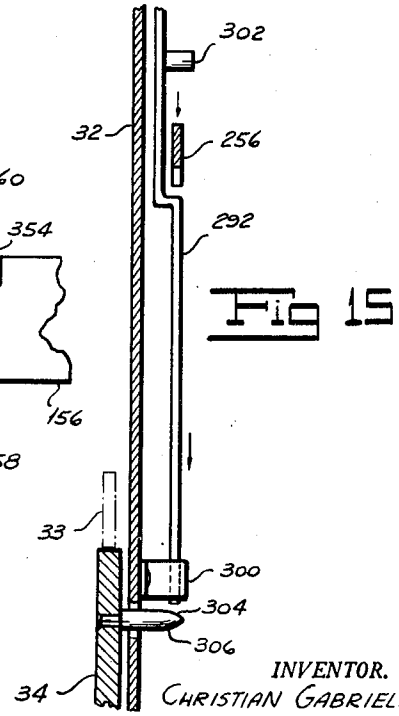


Fig 15

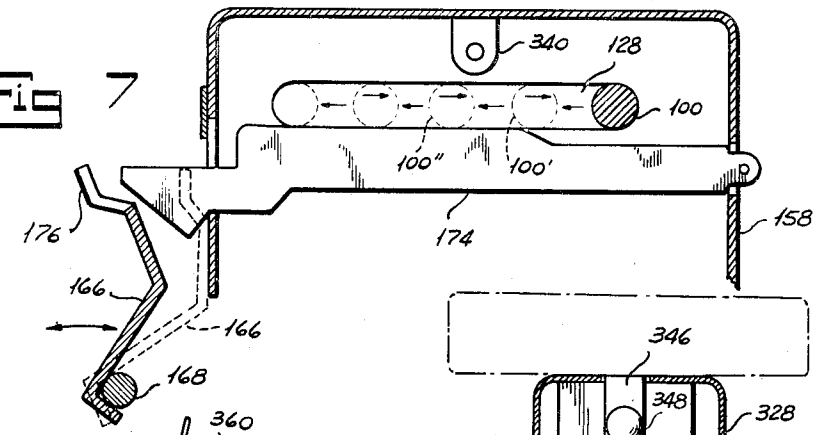
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COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 7



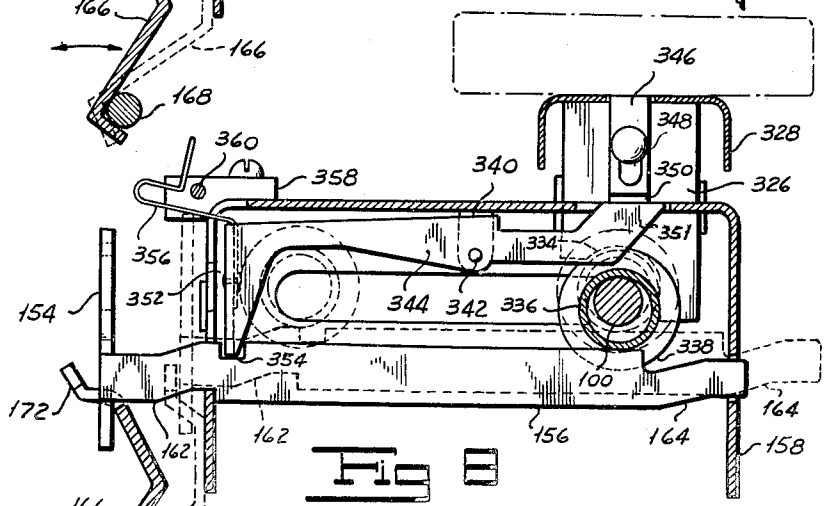


Fig 8

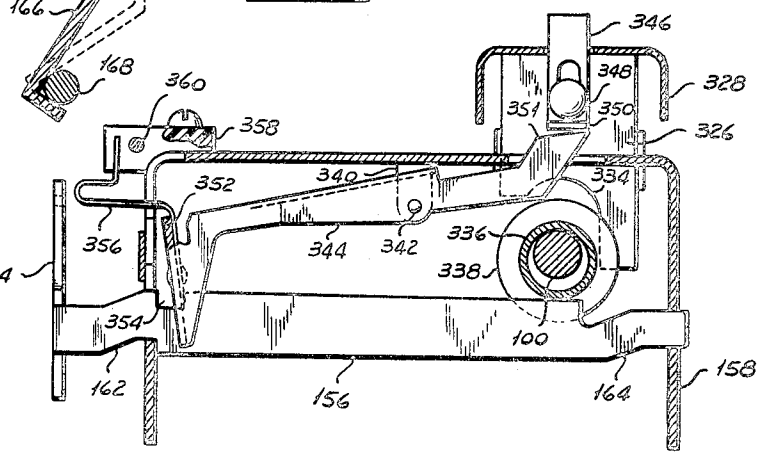


Fig 9

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March 27, 1951 C. GABRIELSEN 2,546,690

COIN-CONTROLLED ELECTRICAL VENDING MACHINE

Filed April 6, 1948 9 Sheets-Sheet 8

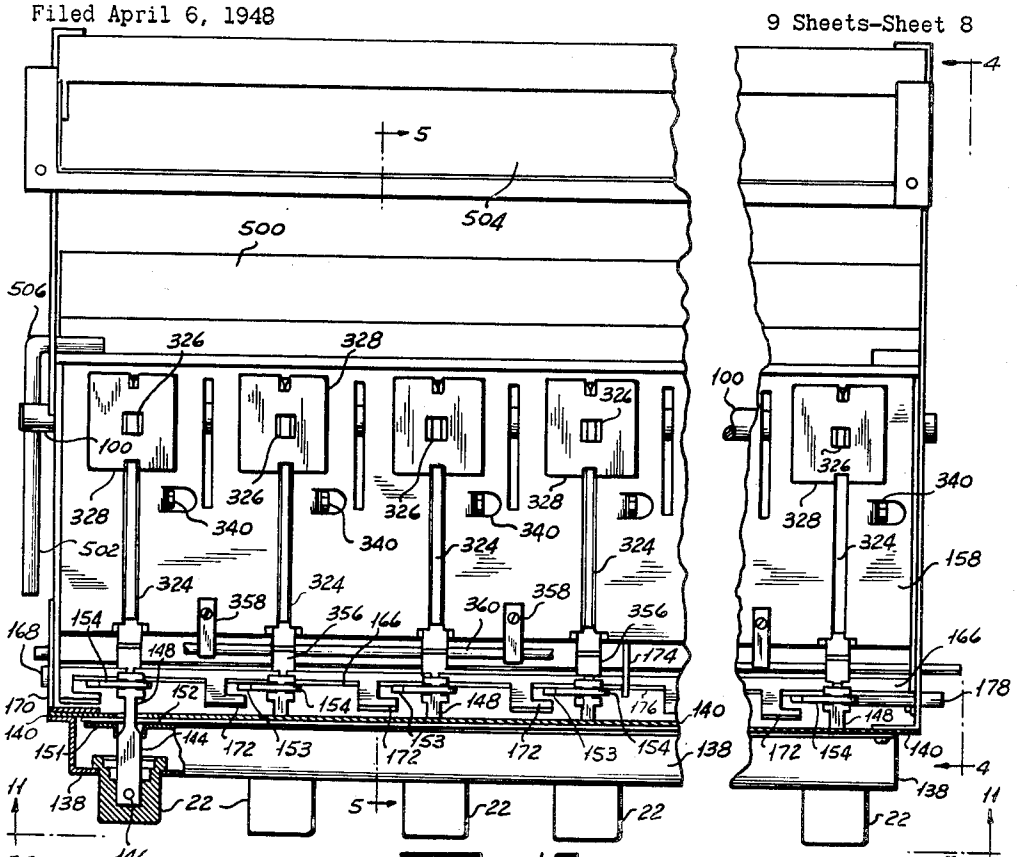


Fig 10

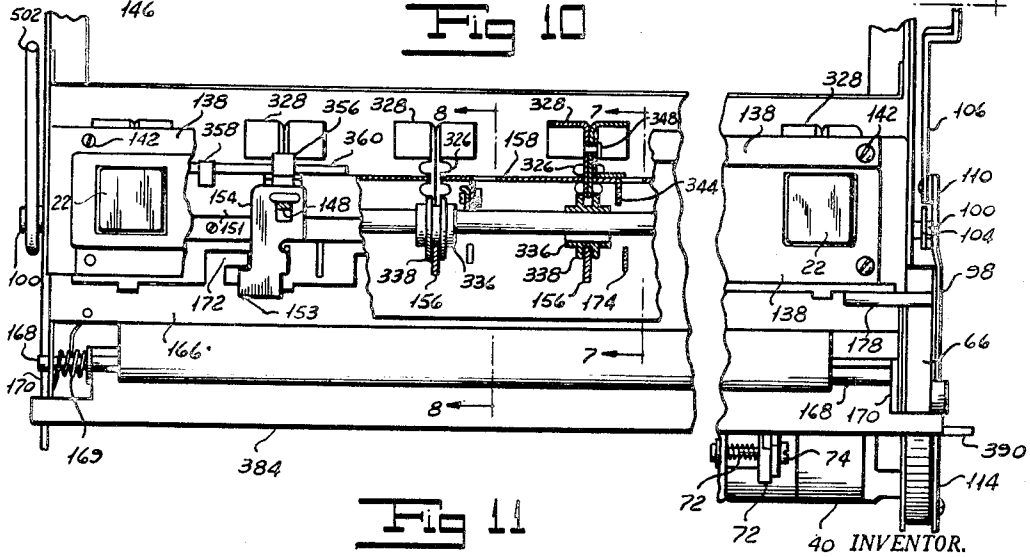


Fig 11

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March 27, 1951 C. GABRIELSEN 2,546,690

COIN-CONTROLLED ELECTRICAL VENDING MACHINE

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Fig 16

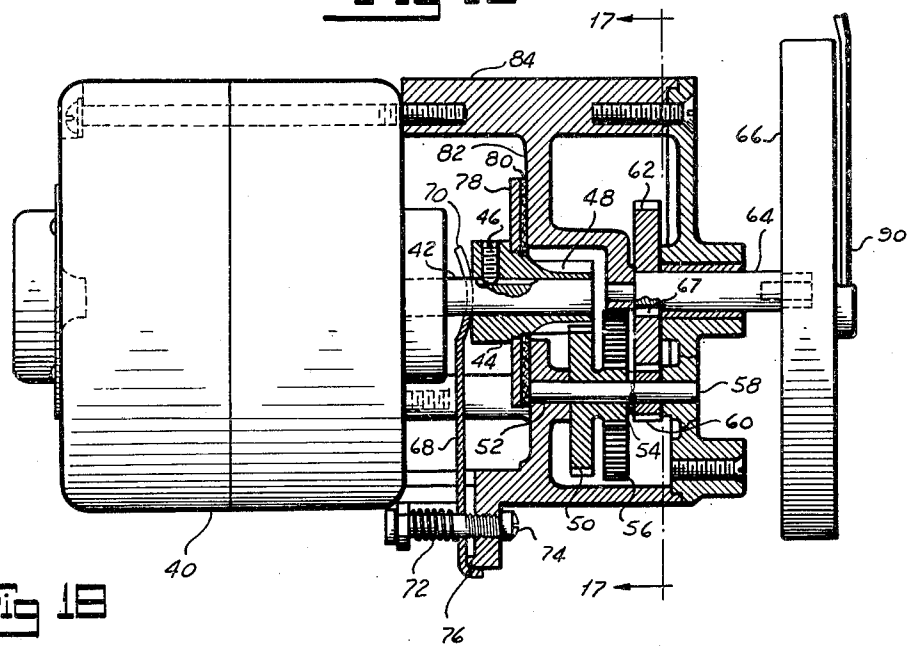
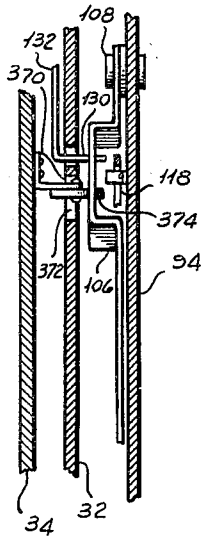


Fig 18



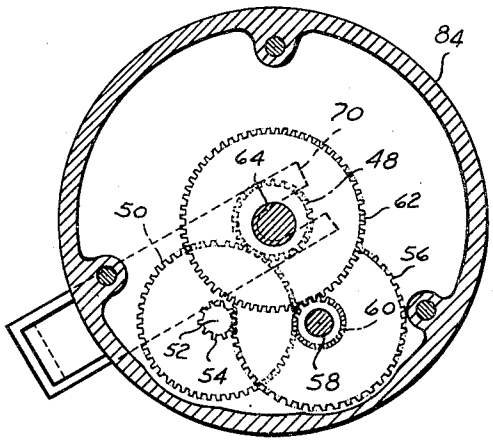


Fig 17

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Patented Mar. 27, 1951

2,546,690

UNITED STATES PATENT OFFICE

2,546,690

COIN-CONTROLLED ELECTRICAL VENDING MACHINE

Christian Gabrielsen, Whippany, N. J., assignor to Rowe Manufacturing Co., Inc., Whippany, N. J., a corporation of New York

Application April 6, 1948, Serial No. 19,313

20 Claims. (Cl. 194—1)

1

My invention relates to coin-controlled electrical vending machines and more particularly to a coin-controlled electrically-operated vending machine of great flexibility, simplicity in construction, certainty in operation and adapted to vend a plurality of different kinds or brands of merchandise such as cigarettes or the like for various prices.

Electrically-operated vending machines have certain advantages in that completely mechanical vending machines are susceptible of abuse. The operating mechanism is apt to be yanked or jerked so that undue strains are placed upon it, frequently causing failure. Then too the excess effort on the part of some purchasers results in the creation of considerable noise so that, in some establishments where vending machines would serve a useful purpose, they are not permitted since the noise occasioned by the operation is considered too distracting. The vending machines of the prior art however are based on complicated electrical circuits and electrical parts, making for increased liability to failure due to short circuits or other electrical faults.

One object of my invention is to provide a coin-controlled electrical vending machine of improved construction which is sure in operation and subject to a minimum development of troubles in operation.

Another object of my invention is to provide an improved electrical vending machine which is easier to maintain, due to a minimum number of electrical parts.

Another object of my invention is to provide an improved electrical vending machine presenting a smaller degree of fire hazard by a reduction in the number of electrical connections and circuits.

Another object of my invention is to provide an electrical vending machine which is reasonable in cost and simple in operation.

Another object of my invention is to provide an electrical vending machine which is less susceptible to atmospheric conditions of humidity and moisture due to a reduced number of electrical parts.

Another object of my invention is to provide a multi-column electrical vending machine in which a common prime mover is adapted to be selectively connected to dispense merchandise from a predetermined column.

Another object of my invention is to provide a multi-column electrical vending machine in which the cycle of operations once commenced may automatically be completed,

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A further object of my invention is to provide a multi-column electrical vending machine in which merchandise selling at different prices may be vended from the same machine and change automatically dispensed.

Another object of my invention is to provide an electrical vending machine in which coins deposited in the machine are used to replenish the supply for the change maker and in which an auxiliary reservoir of coins for change is provided in the event the dispensing reservoir is empty.

Another object of my invention is to provide a multi-column electrical vending machine in which the purchaser is automatically advised when the selected column is empty.

Other and further objects of my invention will appear from the following description.

For purposes of convenience and not by way of limitation, I will describe my invention with respect to the sale of cigarettes although it is to be understood that my vending machine may be used to vend any article which may be stacked or packaged and the packages placed in stacks.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views:

Figure 1 is a perspective view of a vending machine containing one embodiment of my invention;

Figure 2 is a sectional view drawn on an enlarged scale taken along the plane 2—2 of Figure 1;

Figure 3 is a fragmentary sectional view drawn on an enlarged scale taken along the plane 3—3 of Figure 1;

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 10;

Figure 5 is a fragmentary sectional view taken along the line 5—5 of Figure 10;

Figure 6 is a fragmentary perspective view drawn on an enlarged scale with parts in section showing the dispensing plunger assembly;

Figure 7 is a fragmentary sectional view taken along the line 7—7 of Figure 11;

Figure 8 is a fragmentary sectional view taken along the line 8—8 of Figure 11;

Figure 9 is a fragmentary sectional view similar to Figure 8 showing the empty column lock in operation;

Figure 10 is a sectional view taken along line 10—10 of Figure 5;

Figure 11 is an elevation with parts in section taken along line 11—11 of Figure 10;

Figure 12 is a sectional view taken along line 12—12 of Figure 5;

Figure 13 is a sectional view taken along line 13—13 of Figure 12;

Figure 14 is a fragmentary sectional view drawn on an enlarged scale taken along plane 14—14 of Figure 6;

Figure 15 is a sectional view taken along line 15—15 of Figure 3;

Figure 16 is a fragmentary view with parts in section taken along line 16—16 of Figure 4;

Figure 17 is a sectional view taken along line 17—17 of Figure 16;

Figure 18 is a fragmentary sectional view taken along line 18—18 of Figure 4.

Any suitable coin register may be used with my invention. I prefer to use the coin register described in my co-pending application Serial Number 768,997, filed August 16, 1947.

In general, my invention contemplates the provision of a cabinet or housing provided with a plurality of columnar containers in which the cigarettes to be dispensed are adapted to be stacked. A push button is associated with each column. The arrangement is such that unless the proper sum is placed in the coin register the operation of a push button will have no effect. A locking arrangement for the push button is provided so that the actuation of one button will preclude the actuation of another button. The merchandise in stacks in the containers normally rests on the top of an ejection member carried by a reciprocating plunger. An electrical motor is provided for reciprocating an operating bar common to all of the ejection plungers. When the coin mechanism is placed in operative condition by the deposit of coins of the proper denomination, the actuation of a push button connects a selected plunger with the operating bar and energizes an electric motor. The electric motor is provided with a cam for converting rotary motion into reciprocating motion. An empty column lock is provided for preventing the coupling of the plunger with the operating bar when the container for the column of merchandise is empty. I provide means too for signaling to indicate that the particular column selected by the purchasers is empty. If merchandise is in the column, the first movement of the plunger is to bring the ejection member forwardly of the column of merchandise permitting the bottommost package of, say, cigarettes to drop to a position where the return of the plunger will cause the package of cigarettes to be ejected. Means are provided during the time that the plunger is retracted for preventing the fishing of packages of cigarettes from the container. Normally the column of packages of cigarettes are housed within the container so that they cannot be fished from the machine through the delivery chute.

Means are provided to insure that the cycle of operations is completed, once set into operation. The rotation of the cam is also employed to deliver a package of matches, simultaneously with the delivery of the merchandise. Means are provided for accepting the coins placed in the coin register. Safety means are provided to prevent the operation of the coin return mechanism simultaneously with the operation of a push button for causing the delivery of a package of cigarettes from a selected column. I provide a price differential mechanism so that merchandise of different prices may be dispensed from the same

machine. The arrangement is such that merchandise and the proper amount of change is delivered, depending on the denomination of the coins deposited in the register. The construction is such that the machine will perform only one cycle of operations and then accept the coins in the coin register so that it will be necessary to place additional coins in the coin register in order to cause the vending machine to go through another operating cycle. I provide an auxiliary reservoir of coins for making change which is automatically placed into operation when the dispensing reservoir is empty of coins.

The prime mover comprises an electric motor adapted to operate at high speeds, constructed with an integral reduction gear and provided with a friction brake to prevent the motor armature from coasting after the supply of voltage to the motor brushes is cut off.

More particularly, referring now to the drawings, the vending machine is housed in any suitable casing 18 provided with a delivery chute 20 for the cigarettes dispensed from the eight columnar containers housed within the casing. A plurality of push buttons 22, one for each of the columns of cigarettes, are provided. A coin slot is adapted to drop a coin into the hopper 24 of the slug ejector 26 for passage to the coin register 28. After the merchandise is delivered, the coins are adapted to be collected in a coin box 30. The slug ejector and the coin register and associated parts are carried by a casing 32.

Referring now to Figure 16, I mount an electric motor 40 adjacent the front of the machine adapted to drive a shaft 42. A bushing 44 is provided with a plurality of elongated gear teeth 48, meshing with the teeth of gear 50 and journalled for rotation upon shaft 52. Secured to gear 50 for rotation therewith is a pinion 54, meshing with gear 56 which is mounted upon shaft 58 for rotation therewith. Secured to gear 56 for rotation therewith, I provide a pinion 60 meshing with the teeth of gear 62 which is secured to a shaft 64 by a key 67. Secured to the shaft 64 for rotation therewith is a cam 66. It will be observed that the gear train comprising pinion 48, driving gear 50, rotating pinion 54, driving gear 56, rotating pinion 60, driving gear 62, forms a reduction gear so that the armature of the high speed motor 40 will drive shaft 64 with much greater torque and at a lower speed. When the voltage applied across the armature circuit of the motor 40 is interrupted, there is a tendency due to the high reduction gearing used for the motor to coast through its own inertia. In order to prevent this, I have provided a friction brake comprising a member 68 provided with bifurcated end 70 bearing against bushing 44. A spring 72, the bias of which may be increased by screwing bolt 74 to the right, as viewed in Figure 16, urges the member 68 into frictional contact with the bushing 44. The lower end of member 68 is fulcrumed around a ledge 76, as can readily be seen by reference to Figure 16. Set screw 46 is such that the bushing 44 will rotate with the motor shaft 42 but is free to move axially thereof. The bushing carries a plate 78 provided with brake lining 80 bearing against the surface 82 of the motor housing 84. The adjustment of the bolt 74 is such that the spring pressure of the spring 72 will exert sufficient friction between the brake lining 80 and the housing surface 82 to prevent the motor armature from overrunning when the electrical potential

of the armature circuit of the motor is interrupted.

Referring now to Figure 4, the cam 66 is provided with a cam track 86 in which I lodge a cam follower 88. A double bell crank 90 is pivoted about a pivot pin 92 carried by framework 94 of the machine. One arm 96 of the double bell crank carries the follower 88. Another arm of the bell crank 98 has its upper end connected to an operating bar 100 by means of pin 102 and link 104. A lever 106 is pivoted around pin 108. The lower end of lever 106 is connected to the upper end of bell crank arm 98 through link 110 and pivot pins 102 and 112. A third bell crank arm 114 is pivotally connected by pin 116 to the lower end of pusher link 118. A spring 120 normally urges the link 118 to the left as viewed in Figure 4. The upper end of link 118 is adapted to engage a ratchet wheel 120 normally immobilized by a ratchet 122. The ratchet wheel 120 is adapted to actuate a match-delivery mechanism (not shown) of any appropriate design.

The motor is adapted to rotate the cam 66 in a clockwise direction. The operating bar 100 is carried by a pair of gear segments 124 adapted to rock in racks 126 as can readily be seen by reference to Figure 5. A pair of horizontal slots 128 serve to constrain the operating bar 100 to move in a horizontal plane and to maintain the gear segments 124 in engagement with the racks 126. In this manner, the operating bar will move parallel to itself as it reciprocates in the slots 128. The rotation of the cam 66 will, through bell crank arms 96 and 98 and link 104, reciprocate the operating bar 100 in the slots 128. The upward motion of the link 118 will operate the match-delivery ratchet wheel 120. The oscillation of the upper end of bell crank arm 98 will cause the lever 106 to oscillate around its pivot 108 through the link 110. The oscillation of the lever 106 will oscillate the lug 130. This lug is carried by bell crank 132 pivoted around pin 134 as can readily be seen by reference to Figure 2 in which I have shown a view with part of the casing of the coin register per se and the pivoted money shelf 34 removed to show the arrangement of parts. The coin register shown in my co-pending application Serial Number 768,998 is provided with a plurality of slides, each having arms extending from the coin register 28 into the casing 32. The linkage operated from the push buttons 22 is adapted to move the slides and the arms forwardly as will be hereinafter more fully pointed out. A section of the arm 36 attached to the upper slide adapted to be freed by a quarter and a section of the arm 38 adapted to be freed by two dimes is shown in Figure 2.

A spring 136 urges the bell crank 132 to rotate, thus maintaining the lug 130 against the side of lever 106.

Referring now to Figure 5, the push buttons 22 are mounted in a casing formed by a flange member 138 and a backing plate 140 held in assembled position by bolts 142. Slides 144 are secured to the push buttons 22 by means of pins 146. Each of the slides 144 are formed with an end portion 148 of reduced width, as can readily be seen by reference to Figure 12. A pair of cam surfaces 150 are provided adjacent each end 148. The slides 144 extend through a sub-housing 151 carried by the backing plate 140. A plurality of slide-locking members 152 are lodged in the sub-housing 151 for sliding movement therein. When one of the slides 144 is pushed forwardly, the cam surfaces 150 will move the slide-locking members 152 to the right and to the left, immobilizing each of the other slides 144. This can readily be seen by reference to Figures 12 and 13 in which the slide 144' is pushed forwardly, camming the slide-locking members 152 to a position in which all of the other slides 144 are locked. This construction insures that only one push button 22 may be actuated at a time. Secured to the end of each slide 148, I provide a vertical plate 154, adapted to be moved with the slide, as can readily be seen by reference to Figure 5, 6 and 10.

Formed integrally with each vertical plate 154 or otherwise secured thereto, I provide a plurality of plunger-connecting cams 156. The cams are carried by the plunger housing 158 in a plurality of slots 160 formed therein as can readily be seen by reference to Figure 6. Each of the plunger-connecting cams are provided with cam surfaces 162 and 164 so that, when they are moved to the right as viewed in Figures 6, 8 and 9, they will move upwardly to the dotted-line position shown in Figure 8.

The lower ends of the plates 154 contact a plate 166 carried by a rod 168 which is pivoted in brackets 170, as can readily be seen by reference to Figures 5, 6 and 10. The plate 166 is formed with a plurality of lugs 172. The arrangement is such that the lower portion of plate 154 contacts the pivoted plate 166 below the lugs 172. Each plate 154 is provided with an extension 153 underlying the lugs 172, as can readily be seen by reference to Figures 6, 10 and 11. As one of the depending plates 154 moves forwardly under the influence of a push button, the pivoted plate 166 rotates, bringing the lug 172 downwardly in front of the extension 153. The arrangement is such that, as long as the pivoted plate 166 is held in its forward position, the lug 172 will constrain the plate 154 to remain in a forward position. At the same time, the forward movement of the plate 166 brings the lugs 172 in back of the extensions 153 of all the other plates 154 so that none of these plates can be moved forwardly.

Referring now to Figure 7, I provide a plate-locking lever 174, pivoted at the rear of the plunger housing 158. A slot 176 is provided in the plate 166 adjacent the locking lever 174. As the plate is moved forwardly under the influence of one of the slides, it moves to the dotted-line position shown in Figure 7, camming the lever 174 upwardly and then permitting it to drop. The operating bar 100 moves through the locus shown in Figure 7. As the operating bar moves to the position indicated by the reference numeral 100', it will start to hold the locking bar 174 downwardly, thus locking plate 166 in its dotted-line position. When the operating bar is in the position 100'', the locking lever 174 securely locks the plate 166 in its dotted-line position.

A rod 178 is secured to the pivoted plate 166 adjacent its right-hand end as viewed in Figures 6, 10 and 11. The rod 178 is also shown in Figure 3, to which reference is now had. A lever 180 is pivoted about pivot pin 182, carried by the casing 32. A lever 184 is pivoted about a pin 186, carried by the lower end of lever 180. The lever 184 is provided with a notch 188 in which the rod 178 seats. A spring 190, extending between lever 180 and lever 184 beyond the pivot 186, urges the notch 188 into seating position with rod 178. A cam 192 is carried by the lever 184 and is adapted to co-act with the op-

erating bar 100 so that movement of the operating bar to the right will pivot the lever 184 around its pivot pin 186 against the action of spring 190. As the rod 178 is carried forwardly by the pivoting of the plate 166, the lever 184 moves bodily to the left as viewed in Figure 3. The other end of lever 184 is provided with a pin 194 lodged in a slot 196 formed in a lever 198 pivoted about pin 200. A lever 202 is pivoted about a pin 204. One end of lever 202 is provided with a pin 206 lodged in a slot 208 formed at the upper end of a link 210, the lower end of which is pivotally connected to lever 184 by pin 212. A spring 214 is connected to the other end of lever 202 and urges the lever 202 to rotate in a counterclockwise direction. The lever 202 however is stopped from moving under the influence of spring 214 by the toe 216 formed at the lower end of a lever 218 which is pivoted about a pin 220. The upper end of lever 218 is adapted to be contacted by slide extension members 222, 224, 226 and 228 of the coin register. The rearward motion of the pivot pin 186 pivots lever 180 in a clockwise direction around its pivot 182. A lever 230 is pivoted about pin 232. A link 234 is pinned to lever 230 adjacent its lower end by means of pin 236. The other end of lever 234 is pivotally connected to the upper end of lever 180 by pin 238. A lever 240 is pivoted about a pin 242 and its biased to rotate in a counterclockwise direction by spring 244. A bent lever 246 has one end thereof secured to the lever 230 by means of pivot pin 248. A bell crank 256 is pivoted about pivot pin 258. One end of the bell crank is pivotally connected to the bent lever 246 by pin 260. The spring 244 biases the bell crank 256 to rotate in a clockwise direction. The lower end 262 of the bent lever 246 is attached through spring 264 to a pair of links 266 and 268. The link 266 is attached through links 270 and 272 to the coin register slides 222 and 224. The link 268 is attached through links 274 and 276 to the register slides 226 and 228. The lower end of lever 230 carries a roller 278 adapted to engage the cam surface 280 formed at the end of lever 240.

A lever 282 is pivoted about pin 284. The end 286 of lever 282 is attached to the coin return slide of the vending machine accessible outside of casing 18. A pin 288 is carried by lever 282 in a slot 290 formed in a link 292. The upper end of link 292 is adapted to actuate the scavenging operating mechanism 294 of the slug ejector 26. A spring 296 is attached to pin 288 and normally biases the lever 282 to a position to the top of the slot 298. A spring 298 biases the lever 282 and the link 292 upwardly. The lower end of the link 292 is adapted to reciprocate in a strap 300 secured to the exterior of casing 32, as can readily be seen by reference to Figures 3 and 15. A stop pin 302 is carried by the link 292. The downward movement of the link 292 under the influence of the coin return lever 282 will bring the lower end of link 292 into contact with the cam surface 304 formed on pin 306 carried by the coin shelf 34 of the coin register, thus tilting the coin shelf to the left as viewed in Figure 15 and permitting coins 33 on the coin shelf to fall therefrom to the coin return chute back to the purchaser.

Again referring to Figure 3, rearward motion of the rod 178 will carry the lever 184 to the left, thus rotating the lever 198 in a counterclockwise direction. The upper end of lever 198 is provided with serrations 308. At the same time, the lever 180 will be rotated in a clockwise direction, thus carrying the link 234 to the right and pivoting lever 230 around its pivot pin 232 in a counterclockwise direction. This carries the roller 278 under the cam surface 280 and rotates the lever 240 in a clockwise direction against the action of the spring 244. The rotation of the lever 230 in a counterclockwise direction will carry the bent lever 246 to the right, thus placing tension upon spring 264 and urging each of the register slides 222, 224, 226 and 228 to the right as viewed in Figure 3. At the same time, the motion to the right of bent lever 246 will rotate the bell crank 256 in a counterclockwise direction, bringing the end of bell crank 256 under the stop pin 302 to immobilize the coin return link 292. If the proper coins are in the register, one of the slides will be freed, permitting it to move to the right to contact the upper end of lever 218, rotating this lever in a clockwise direction and carrying the toe 216 to the left from under the shoulder 201 formed on the lever 202. This permits the lever 202 to rotate in a counterclockwise direction under the influence of spring 214 so that the corner 203 formed on the lever 202 will seat in one of the serrations 308 to hold the lever 184 to the left. The toe 216 formed at the bottom of lever 218 contacts a member 310 carried by the upper end of a lever 312, moving member 310 to the left as viewed in Figure 3 and to the right as viewed in Figure 4, to which reference is now had. The lever 312 is pivoted about a pin 314. The lower end of lever 312 contacts a circuit-making button 316 of switch 318 to which voltage is supplied through conductors 320 and 322. The movement of member 310 under the influence of the movement of toe 216 will rotate lever 312 in a clockwise direction to close the circuit to the motor 40.

Referring now to Figures 5, 6, 7, 8, 9, 10 and 11, the plunger housing 158 is provided with a plurality of slots 324 in which I seat a plurality of plungers 326 for reciprocating motion therein. Each of the plungers 326 carries an ejector 328.

Normally the columns of cigarettes are stacked in containers 330 with the bottom package of cigarettes resting on the top of each ejector 328 associated with each container 330 as can readily be seen by reference to Figures 5 and 6. The bottom rear edge 332 of the container, as shown in Figure 5, extends downwardly sufficiently so that it is impossible to fish a package of cigarettes from the container through the delivery-chute opening 20.

Each of the plungers 326 is formed with a re-entrant circular portion 334. The operating bar 100 carries a plurality of spools 336 loosely lodged thereon and normally resting on the top of the plunger-connecting cams 156. The spools 336 are provided with a pair of flanges 338 embracing the sides of the plunger-connecting cams 156. The raising of the spools 336 under the influence of the cams 156 will seat the spools in the circular re-entrant portions 334 formed on the plungers, thus connecting the operating bar 100 to the plunger 326.

The plunger housing 158 is formed with a plurality of lugs 340 to which are pivoted by pins 342 a corresponding plurality of plunger-locking levers 344. A plunger-locking lever control member 346 is carried for vertical movement by pin 348 attached to plunger 326. The lower end of plunger-locking lever control member is provided with a flange 350 which is adapted to engage the outer toe 351 of the locking lever 344. When there is at least one package of cigarettes on

the top of the ejector plate 328, as shown in Figures 6 and 8, the plunger-locking lever is in a substantially horizontal position, that is with the locking plate 352 out of engagement with the recess 354 formed in the plunger-connecting cam 156. When however the packages of cigarettes in a column are exhausted, the weight of the long arm of the plunger-locking lever 344 will rotate it in a counterclockwise direction as shown in Figure 9 to permit the locking plate 352 carried by the end of the locking lever 344 to seat in a recess 354 as shown in Figure 9. It will be observed that the length of the recess 354 is such as to permit a limited movement of the plate 154 and the plunger-connecting cam 156. Secured to the locking plate 352, I provide a spring-conducting clip 356. Carried in a plurality of insulating blocks 358 which are attached to the plunger housing 158, I provide a conducting rod 360. When the locking lever 344 is in the position shown in Figure 8, the forward motion of the plunger-connecting cam 156 and the plate 154 is along a locus clear of the spring clip 356. When however a column is empty and the locking lever 344 moves to the position shown in Figure 9, the forward motion of plate 154 under the influence of its corresponding push button is permitted to move through the amplitude of the length of the recess 354. It will be noted too that the spring clip 356 is now in the path of the movement of the plate 154 so that the spring clip will be brought into contact with the conducting rod 360 supported by the insulating blocks 358. This completes a circuit which includes a small incandescent lamp and a low voltage battery (not shown). The lamp is positioned behind a signal window 362 shown in Figure 1 and indicates to the purchaser that the column is empty.

As the motor drives the cam 86 in a clockwise direction, the double bell crank 90 rotates around its pivot 92, first in a counterclockwise direction, and then is returned rotating in a clockwise direction. A link 110, as pointed out above, oscillates lever 106. During the oscillation of the link 106 in a clockwise direction, it will rotate the bell crank 132 in a clockwise direction. This can readily be seen by reference to Figure 18. The money shelf 34 carries a bracket 370 projecting through an opening 372 formed in the casing 32. A roller 374 is carried by bracket 370 and projects into the path of movement of the lever 106. As the lever 106 oscillates around its pivot 108 in a clockwise direction as viewed in Figure 4, it will strike the roller 374 and rotate the money shelf 34 to accept the money as can readily be seen by reference to Figure 18. The money shelf is suspended for rotation about an axis which is between the point of attachment of the cam 304 operated by the coin return and the point of attachment of the bracket 370. The construction is such that the coin return cam 304 will rotate the money shelf in a counterclockwise direction as viewed in Figure 15. The roller 374, when acted upon by the lever 106, will rotate the money shelf in a clockwise direction. This permits the coins resting on the edge of the money shelf to fall into the cash box 30 shown in Figure 1.

Referring now to Figure 4, a link 376 is carried by casing 94 for reciprocal movement in a horizontal plane. The toe of link 376 contacts resetting member 378 of the switch 318. A pimple cam 380 is carried by the cam 86. After the cam rotates one revolution, the pimple cam 380 will move the link 376 to the right, operating the re-setting member 378 of the switch 318. This breaks the circuit to the motor and re-sets the starting switch 316. The cam track 86 is provided with an area 382 of increased curvature to provide increased resistance to assist the brake in stopping the cam at the initial part of the cycle. At the initial point, the cam follower 88, carried by the end of arm 96 of the double bell crank, will rest in the depressed portion 382 of the cam track 86 and the pimple cam 380 will be just beyond contact with the reciprocating link 376.

Referring now to Figure 5, it will be seen that a second flap 384 similar to the plate 166 is pivoted about the rod 168. In Figure 5, this flap hangs downwardly and has no part in the action just described.

Referring now to Figures 6 and 14, it will be observed that the flap 384 is now in position so that the movement of the push button 22 shown in Figure 6, in moving the plate 154 to the right, will move the tab 386 secured to the plate 154 by screw 388 to the right, thus rotating the flap 384. The flap 384 is the price differential flap and tabs 386 are secured to the plates 154 of those push buttons which are associated with cigarettes selling at a lower price. The top of the end of plate 384 carries a rod 390 adapted to contact a lever 392 which is the price differential lever. The rod 390 and the price differential lever 392 are shown in Figure 2, to which reference is now had. The arm 36 in Figure 2 is associated with the slide 222 of the coin register which is adapted to be freed by a twenty-five cent piece. The arm 38 is associated with the slide 224 of the coin register which is adapted to be freed by two dimes. The arm 394 is associated with the price differential level of the coin register which is described in my co-pending application Serial Number 768,997 in which the effect of the movement of the arm 394 is to simulate the deposit of a nickel and to permit the actuation of arms 36 and 38. If for example cigarettes are selling for 20¢ a package, the change-maker which will be more fully described hereinafter will return a nickel for a quarter deposited, together with a package of cigarettes. With the price differential set to dispense cigarettes at 15¢ per package, two nickels will be returned together with a package of cigarettes upon the deposit of a quarter, and one nickel will be returned when two dimes are deposited. The money shelf 34 is provided with a coin shute 396 from which nickels 398 are adapted to be returned to the purchaser as change. The lever 400 frees one nickel and the lever 402 frees a second nickel. The lever 400 is adapted to be operated by a cam 404 carried by a lever 406 pivoted about pivot 408 and biased to rotate in a clockwise direction as viewed in Figure 2 by spring 410. The change-dispensing lever 402 is operated by cam 412 carried by a lever 414 pivoted about a pivot 416 and biased to rotate in a clockwise direction by spring 418. A link 420 carries a pin 422 and a pin 424. The upper end of link 420 is secured to a pivoted latch 426 normally held in the upper position by the arm 36. A spring 428 normally urges the link 420 downwardly. Another link 430 carries a pin 432. The upper end of link 430 is secured to a pivoted latch 434, held in horizontal position by the arm 38. The link 430 is urged downwardly by spring 436. A feeler link 438 rests upon the nickels 398 in the coin chute 396. The upper end of the feeler link 438 is secured to a bell crank 440 by pin 442. The bell crank 440 is pivoted about pin

444 and is connected at its upper end to a link 446 which carries a pin 448 adapted to contact a lever 450 which is pivoted about a pin 458. A bell crank 454 is pivoted about a pin 456 carried by the casing 32. One en do fthe bell crank 454 carries the pin 458 around which the lever 450 is pivoted. An auxiliary coin tube 460 containing nickels 462 is provided. A nickel-dispensing member 464 is carried at the bottom of the coin tube 460 by the upper end of bell crank 454. The arrangement is such that the rotation of the bell crank 454 in a counterclockwise direction will permit one nickel to drop and be dispensed on the return motion of member 464 through chute 466 to the coin chute 396. A spring 468 normally biases the lever 450 to rotate in a clockwise direction. The pin 448 carried by the link 446 normally holds the lever 450 with its lower end to the right against the action of spring 468 in the position shown in Figure 2. Each operation of the machine will rotate the bell crank 132 in a clockwise direction. Secured to the bell crank 132 is an arm 470 provided with a toe 472 which is disposed in a slot 474 carried by the lower end of the lever 450. When the lever is in the position shown in Figure 2, the toe 472 simply rides in the slot 474 without any effect. When however the feeler 438 drops because the nickels in the coin chute 396 are exhausted, the bell crank 440 rotates in a counterclockwise direction, pulling the link 446 to the left and moving the pin 448 to the left, thus permitting spring 468 to rotate the lever 450 in a clockwise direction, bringing toe 472 into the notch 476. When this occurs, the rotation of the bell crank 132 will pull the lever 450 downwardly, thus rotating the bell crank 454 about its pivot 456 to permit a nickel to be ejected.

The pin 422, carried by the link 420 engages the top of the lever 406. The pin 424, carried by the link 420, is lodged in a notch 480 formed in the lever 414. The pin 432, carried by the link 430, is lodged in a notch 482 formed in the lever 414.

When a quarter is placed in the machine, the arm 36 moves out to the left so that the latch 426 will move down to a position where the toe 484 formed at the end of the latch will stop its downward movement under the influence of spring 428. This downward movement is such that the lever 406 will be rotated so that its cam 404 will actuate the nickel-dispensing lever 400 to give the customer one nickel. The depth of the notch 480 is such that the pin 424, which also moves downwardly, will not rotate the lever 414. When however the price differential arm 394 is actuated, the amplitude of the motion to the left of the arm 36 is increased so that the latch 426 will rotate in a counterclockwise direction through a greater amplitude, permitting the link 420 to move downwardly through a greater amplitude under the action of spring 428. When this occurs, the lever 406 is first rotated so that its cam 404 will actuate the nickel-dispensing lever 400 and then continue downwardly through a greater amplitude than the depth of the notch 480 to rotate the lever 414 so that its cam 412 will contact the second nickel-dispensing lever 402 and thus give two nickels in change, instead of one.

For the twenty-cent scale, the two-dimes arm 38 moves to the left but through an insufficient amplitude to permit the link 430 to move downwardly more than the depth of the notch 482 formed in the lever 414. Thus the pin 432 simply rides in the notch 482 without actuating the lever 414. When however the price differential arm 394 is moved, the latch 434 is permitted to rotate through a greater amplitude so that the link 430 will move downwardly sufficiently to rotate the lever 414 so that its cam 412 will actuate the nickel-dispensing lever 402. In this manner, when the price differential flap is in operation, a nickel in change is given for a deposit of two dimes, and two nickels in change are given for a deposit of a quarter, along with a 15¢ package of cigarettes.

When the operating bar 100 is coupled to one of the plungers, it moves to the right as viewed in Figure 5 and strikes the arm 502 which is secured to a shaft 506, rotating the shaft in a clockwise direction. A flap 500 is secured to the shaft 506 for rotation therewith. When the plunger 326 moves to the right and carries with it the ejector 328, the bottom package of cigarettes of the column is allowed to fall downwardly to the top of the plunger housing 158. In this position, cigarettes could be fished from the container through the delivery opening 20. In order to preclude this, the flap 500 is thus moved to the dotted-line position shown in Figure 5, protecting the column of cigarettes. As the operating bar 100 returns, the ejector 328 pushes out the package of cigarettes resting on the plunger housing and supports the bottommost of the remaining of the column of cigarettes. The flap returns to its full-line position and the cigarettes are directed by the baffle 504 to the delivery chute.

In operation, let us assume that no coins are in the coin register and a purchaser presses one of the buttons 22. This carries the slide 144, the depending plate 154 and the plunger-coupling cam 156 forwardly. At the same time, the slide locks are operated so that the slide lock members 152 will preclude the pressing of any other button. The pivoted plate 166 is carried forwardly, carrying the rod 178 and the lever 184 forwardly. In order to ease the pressure on the push button, I have provided the roller 278 and the lever 240 and the spring 244 as shown in Figure 3. The forward motion of the lever 184 pivots the lever 180 around its pivot pin 182, carrying the link 234 to the right and thus pivoting lever 230 in a counterclockwise direction around its pivot pin 232. This carries the bent lever 246 to the right and pivots the bell crank 256 to immobilize the coin return link 292 through the pin 302. The movement to the right of the bent lever 246 places a tension on spring 264 which is coupled to the slides 222, 224, 226 and 228, urging the slides to move to the right as viewed in Figure 3 and to the left as viewed in Figure 2. Since no coins are in the register, none of the slides are free. Upon release of the push button, the spring 244, acting through lever 240, cams the lever 230 to rotate in a clockwise direction, carrying the bent lever 246 and the link 234 to the left as viewed in Figure 3. This movement rotates the bell crank 256 in a clockwise direction, releasing the coin return linkage. The movement to the left of the link 234 rotates the lever 180 in a counterclockwise direction, moving the lever 184 to the right and permitting the spring 169 shown in Figure 10 to rotate the plate 166 in a clockwise direction as viewed in Figure 3, thus carrying the plate 154 and the plunger-coupling cam 156 to the right as viewed in Figure 5 and returning the push button to its original position and releasing the slide lock members 152. It will be observed too that, when the plunger coupling

cam 156 moves to the left as viewed in Figure 5 and to the right as viewed in Figure 8, the coupling spool 336 which is carried by the operating bar 100 is coupled to the plunger 326 so that any movement of the operating bar will thereby be communicated to the plunger.

Let us now assume that a purchaser deposits a coin or coins in the coin register of sufficient denomination to free one of the slides. In practice, as pointed out in co-pending coin register application, Serial Number 768,997 the slides are such that they are adapted to be freed by a quarter, two dimes, a dime and two nickels, or four nickels, if cigarettes are selling for 20¢. If a quarter is deposited, cigarettes and a nickel in change is returned. If the price differential assembly is in use and set for 15¢, the slides will be freed by a quarter, two dimes, a dime and a nickel or three nickels. If a quarter is deposited, two nickels are given in change and if two dimes are deposited one nickel is given in change. It is to be understood further that any appropriate coin register mechanism may be employed. With coins in the coin register adapted to free one of the slides, a push button is now pressed. The lever 184 again moves to the left as viewed in Figure 3, as described above, rotating the locking crank 198 in a counterclockwise direction and rotating the lever 230 in a counterclockwise direction to place the spring 264 under tension. One of the slides now being freed will move to the right as viewed in Figure 3 and strike the upper arm of lever 218, rotating it in a clockwise direction against the action of spring 219. This carries the toe 216 of the lever 218 to the left as viewed in Figure 3 and to the right as viewed in Figure 4. The toe 216 pushes the bracket 310, carried by the upper end of lever 312, to the right as viewed in Figure 4, rotating the lever 312 in a clockwise direction around its pivot 314, actuating the switch button 316 to energize the electric motor 40.

As the toe 216 moves to the left as viewed in Figure 3, the spring 214 will rotate the lever 202 in a counterclockwise direction around its pivot 204 due to the fact that the toe 216 has moved clear of the shoulder 201. When this occurs, the corner 203 formed on the lever 202 seats in one of the serrations 398 formed at the upper end of the locking crank 198. This serves to hold the lever 184 to the left as viewed in Figure 3, holding the plate 166 and hence the depending plate 154 and the plunger-coupling cam 156 to the left as viewed in Figure 5 even after the purchaser releases the push button.

The circuit of the motor 40 having been completed, it will start to rotate, driving the cam through the reduction gearing formed by the gear train comprising pinion 48, gear 50, pinion 54, gear 56, pinion 60 and gear 62. The rotation of the cam 66 rotates double bell crank 90 around its pivot 92, first in a counterclockwise direction as viewed in Figure 4 and then back in a clockwise direction to its original position. This motion reciprocates the operating bar 100 through the link 194. Since the operating bar has been coupled to the plunger corresponding to the push button pressed, the plunger and its ejector move to the left as viewed in Figure 4 and to the right as viewed in Figure 5, permitting the bottommost package of cigarettes of the column to drop upon the plunger housing. As the operating bar approaches the limit of its movement in slot 128, it strikes the cam 192 carried by the lever 184 as shown in Figure 3. This rotates the lever 184 about its pivot 186 which is carried by the lower end of the lever 180 in a counterclockwise direction, pulling the link 210 downwardly, rotating the lever 202 in a clockwise direction around its pivot 204 against the action of spring 214. This permits the toe 216 to move to the right as viewed in Figure 3 under the influence of spring 219 attached to the lever 218 above its pivot 220. At the same time, the spring 244 acting through lever 240, cam surface 280 and roller 278 rotates the lever 230 in a clockwise direction, carrying the link 234 to the left and rotating the lever 180 about its pivot 182 in a counterclockwise direction, thus resetting the locking crank 198 and the lever 184. At this point, the pivoted plate 166 is no longer held by the rod 178. The plate 166 however is now held in the position shown in dotted lines in Figures 3 and 7 by means of the plate-locking lever 174. The operating bar 100 however, during its travel along slot 128, is moved to the position holding the locking lever 174 downward as can readily be seen by reference to Figure 7 so that the plate 166 is still held in its dotted-line position even though the locking crank 198 has been released.

As the cam 66 causes the operating bar to change its direction of travel, it will move to the right as viewed in Figures 4, 6 and 7 and to the left as viewed in Figure 5, forcing the ejector 328 to push the package of cigarettes lying on top of the plunger housing to the delivery chute. The operating bar, as it moves to the right as viewed in Figure 5, operates the flap 500 through the arm 502 in order to preclude the shaking of the machine and thus obtaining more than one package of cigarettes during the instant the bottommost package of the column of cigarettes is unguarded by its container. As the operating bar continues its dispensing movement, moving to the right as viewed in Figure 7, it will move to the position 100' so that further movement to the right will free the locking lever 174. The spring 169 is then free to rotate the plate 166 in a counterclockwise direction as viewed in Figure 7, moving the plate 154 to the right as viewed in Figure 5, carrying the slide 144 and its associated push button to the right and carrying plunger-coupling cam 156 to the right, permitting the spool 336 to uncouple rotates from the plunger.

As the arm 98 of the double bell crank shown in Figure 4 rotates in a counterclockwise direction, it carries the link 110 to the left and thus rotates the lever 106 in a clockwise direction. This movement of lever 106, as can be seen by reference to Figure 18, wipes by the roller 374 carried by the bracket 370 which is attached to the money shelf 34 of the register and thus moves the roller 374 to the left as viewed in Figure 18, rotating the money shelf in a clockwise direction, permitting the money resting on the money shelf to fall into the cash box. The timing of the operation is such that the money is accepted before the locking crank 198 is released so that the coin return locking pin 302 is immobilized by the bell crank 256 until the money is accepted.

As the cam completes its cycle, the pimple cam 380 moves the link 376 to the right as viewed in Figure 4, operating the re-setting button 378 which de-energizes the motor and re-sets switch 318 for another cycle of operation. The motor armature, being a high speed motor, would tend to coast to bring the re-entrant portion 382 of the cam past its initial point. This tendency is prevented by the brake plate 78 which is attached to the bushing 44 shown in Figure 16. The tendency to coast is also resisted by the increased

slope to the cam track 86 just prior to the initial point. The coasting therefore is controlled so that the pimple cam is carried just beyond the link 376.

The rotation of the arm 114 of the double bell crank 90 moves match-dispensing connecting link 118 upwardly to operate the match-delivery ratchet wheel 120 so that matches may be delivered along with the cigarettes as is well known to the art.

Let us now assume that a purchaser deposits a coin in a column which is empty. When the last package of cigarettes is dispensed from a column, the empty plunger-locking lever control member 346 will move upwardly under the influence of gravity, acting through the arm of locking lever 344 to the left of its pivot 342. The position of the parts is shown in Figure 9. The locking plate 352 is lodged in the notch 354 formed in the coupling cam 156. At the same time, the conducting clip 356 is moved downwardly into the path of plate 154. The width of the notch 354 is such that a limited movement of the plate 154 is permitted. When a customer now attempts to press the push button associated with the column which is empty, the plate moves forwardly only far enough to permit the clip 356 to make contact with the conducting rod 360, thus completing the circuit to the empty column signal which is visible at the window 362 in Figure 1. The limited movement of the plate 154 is insufficient to operate the linkage to the coin register.

When a quarter is deposited in the machine to obtain a 20¢ package of cigarettes, the customer is given change in the amount of a nickel. This action is initiated by the movement to the left of the arm 36 attached to the quarter slide of the coin register through a limited motion. The movement to the left of the arm 36 permits the latch 426 shown in Figure 2 to free the linkage 420 so that it moves downwardly a limited amount under the influence of spring 428. This movement permits the pin 422, carried by the link 420, to rotate the lever 406 around its pivot 408 in a counterclockwise direction, thus bringing the cam 404 into a position to actuate nickel-dispensing lever 400.

The coin chute 396 shown in Figure 2 is normally supplied with nickels from the nickels placed in the coin register. If however a series of quarters are employed by customers, the coin chute 396 may become depleted. Accordingly, I make provision for an auxiliary reservoir of nickels 460 from which nickels are dispensed when the supply in coin chute 396 is exhausted. The feeler member 438 rests upon nickels in the coin chute 396. It controls the position of the bell crank 440. When nickels are in the chute 396, bell crank 440 is in the position shown in Figure 2. In this position, the link 446 carries the pin 448 to the right, thus moving the lever 450 to the position it occupies in Figure 2.

The bell crank 132 is provided with a toe 130 as can readily be seen by reference to Figures 2 and 18. This toe is positioned in the path of lever 106 so that the bell crank is rotated in a clockwise direction against the action of spring 136 each time the cam completes one revolution. With the lever 450 in the position shown in Figure 2, the toe 472 carried by the arm 470 attached to the bell crank 132 merely rides in the slot 474. When however the supply of nickels in coin chute 396 is exhausted, the feeler lever 438 is permitted to move downwardly, rotating the bell crank 440 in a counterclockwise direction and moving the pin 448 to the left as viewed in Figure 2. This permits the spring 468 to rotate lever 450 in a clockwise direction to lodge the toe 472 in the recess 476. When this occurs, the rotation of the bell crank 132 in a clockwise direction will rotate the bell crank 454 in a counterclockwise direction, thus operating the dispensing slide 464 to eject one nickel from the nickel stack 462. This nickel falls downwardly through chute 466 to the coin chute 396 from which it is dispensed by the dispensing lever 400 which controls the gate through which the nickel passes to the coin return chute to the customer as change. A compartment 395, accessible from the exterior of the machine, is provided for the coins which are returned. If the column is empty and the customer is unable to operate the button for the column associated with the brand of cigarettes he desires, he may operate a coin return lever 286 which moves the link 292 downwardly to cam the money shelf to rotate as shown in Figure 15, permitting the coins to fall into the receptacle 395.

If it is desired to vend cigarettes of a certain band for 15¢ from one or more columns of the machine, a tab 386 is secured to the plates 154 associated with the push buttons to control the columns of 15¢ brands. The price differential flap 384 is of course moved up to the position shown in Figure 6. When a push button fitted with a tab is operated, not only is the plate 166 rotated but the price differential flap 384 is rotated as well. This carries the rod 390 to the right as viewed in Figure 14, rotating the lever 392, in a counterclockwise direction as viewed in Figure 2. This operates the price differential arm 394 of the coin register, the effect of which is to simulate the deposit of one nickel in the four-nickel slide and in the dime-and-two-nickels slide.

The operation of the price differential arm 394 permits a greater amplitude of motion to the left, of the arm 36 on the quarter slide of the coin register, and of arm 38 of the two-dimes slide of the coin register. If a quarter is deposited in the machine and a 15¢ column operated, the movement to the left of the arm 36 is such that the link 420 may move downwardly through a sufficient amplitude so that pin 422 will rotate lever 406 and pin 424 will rotate lever 414, thus operating both of the nickel-dispensing arms 400 and 402 and returning two nickels in change. If two dimes are deposited, the amplitude of motion of the arm 38 to the left is such that link 430 will move downwardly through a sufficient amplitude so that pin 432 will rotate lever 414, so that cam 412 will operate the nickel-dispensing lever 402 to return one nickel in change to the customer. It will be noted that the feeler arm 438 operates in the position of the second nickel so that an additional nickel is always supplied when only one nickel remains in the coin chute 396.

It will be seen that I have accomplished the objects of my invention. I have provided a coin-controlled electrical vending machine of improved construction, which is sure in operation and subject to a minimum development of troubles in operation. I have provided an improved electrical vending machine which is easier to maintain due to a reduced number of electrical parts. My improved electrical vending machine presents a smaller degree of fire hazard because of the reduction in the number of elec-

trical connections. I am enabled to provide an electrical vending machine reasonable in cost and simple in operation and in which atmospheric changes and conditions of humidity have a smaller effect on the cost of maintenance. I have provided a multi-column electrical vending machine in which a common prime mover is adapted to be selectively connected to dispense merchandise from a predetermined column and in which the cycle of operations once commenced is automatically completed. I am enabled to provide a multi-column electrical vending machine in which merchandise selling at different prices may be vended from the same machine and change automatically dispensed. I have provided an electrical vending machine in which coins deposited in the machine are used to replenish the supply for the change maker and in which an auxiliary reservoir of coins for change is provided in the event the dispensing reservoir becomes empty. I have provided a multi-column electrical vending machine in which the purchaser is automatically advised when the selected column is empty.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and sub-combinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is therefore to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, I claim:

1. A vending machine including in combination a plurality of containers in which the articles to be vended are adapted to be stacked, a plurality of ejectors each adapted to eject an article from a respective stack, an operating member mounted for reciprocating motion, a prime mover, means for initiating the action of the prime mover, means driven by the prime mover for reciprocating the operating member, a plurality of coupling members carried by the operating member for selectively connecting it to a predetermined ejector, a plurality of manually operated means corresponding to the plurality of containers adapted to be selectively operated by a purchaser, means responsive to each manually operated means for actuating respective coupling members and means for operating said initiating means, and coin freed means for preventing the operating of the initiating means.

2. A vending machine as in claim 1 in which each of said ejectors is positioned normally to support the bottommost article of a stack.

3. A vending machine as in claim 1 in which said operating member reciprocates in a substantially horizontal plane.

4. A vending machine as in claim 1 in which said operating member comprises a bar and said coupling members are formed with openings, said bar being positioned in said openings.

5. A vending machine as in claim 1 in which said prime mover comprises an electric motor.

6. A vending machine as in claim 1 in which said prime mover comprises an electric motor and a friction brake associated with the armature of said motor to reduce coating upon the deenergization of said motor.

7. A vending machine as in claim 1 in which said prime mover comprises an electric motor, said driven means includes a reduction gear, a cam, and means driven by said cam for reciprocating said operating member.

8. A vending machine as in claim 1 in which said driven means includes a cam, a bell crank, means carried by one arm of the bell crank for control by said cam and means connecting the other arm of said bell crank to said operating member.

9. A vending machine as in claim 1 in which said manually operated means includes a plurality of push buttons.

10. A vending machine as in claim 1 in which said manually operated means includes a plurality of push buttons, said means for actuating said coupling members includes a plurality of cams, said prime mover comprises an electric motor and said initiating means comprises a switch.

11. A vending machine including in combination a plurality of containers in which articles to be vended are adapted to be stacked, a plurality of ejectors each adapted to support a respective stack of articles in the containers, an operating member mounted for reciprocating motion, a prime mover, means for initiating the action of said prime mover, means driven by the prime mover for reciprocating the operating member, a plurality of coupling members carried by the operating member for selectively connecting it to a predetermined ejector, a plurality of manually operated means corresponding to the plurality of containers adapted to be selectively operated by a purchaser, cams movable by respective manually operated means for actuating respective coupling members, a locking member for each cam, means operated by the weight of an article in a container for rendering respective locking members inoperative, the construction being such that when a container is empty of articles to be vended said locking member will prevent said cam from operating the coupling member associated with the empty container.

12. A vending machine as in claim 11 including in combination an elongated pivoted member extending adjacent all of said cams, a plurality of coacting means carried by said cams and said elongated pivoted member for rotating said pivoted member in response to movement of any one of said cams, said prime mover comprising an electric motor, said means for initiating the action of said prime mover comprising a switch, and means responsive to movement of said elongated pivoted member for operating said switch.

13. A vending machine as in claim 11 including in combination an elongated pivoted member extending adjacent all of said cams, a plurality of coacting means carried by said cams and said elongated pivoted member for rotating said pivoted member in response to movement of any one of said cams, said prime mover comprising an electric motor, said means for initiating the action of said prime mover comprising a switch, means responsive to movement of said elongated pivoted member for operating said switch, retaining means for holding said pivoted member in its switch-closing position, means coacting with said operating member for actuating said retaining means and means carried by said elongated pivoted member for holding an active cam in coupling member actuating position.

14. A vending machine as in claim 11 including in combination interlock means for immobilizing all manually operated means except one manually operated means in response to the actuation of that one manually operated means.

15. A vending machine as in claim 11 including in combination a signal adapted to be energized by the completion of an electric circuit, an elongated conductor forming one terminal of said circuit, a plurality of circuit-completing means each carried by respective cam locking members, and means responsive to the movement of said manually operated means for actuating the circuit-completing means when said locking members are in cam locking position.

16. A vending machine as in claim 11 including in combination a flap adapted to extend adjacent the bottom of all of the containers, said flap normally permitting articles to be ejected from the containers, means actuated by the movement of said operating member for pivoting said flap to a position preventing articles being delivered from said containers during the inital stroke of the reciprocating motion of said operating member.

17. A vending machine including in combination a plurality of containers in which articles to be vended are adapted to be stacked, a plurality of manually-operated means corresponding to the plurality of containers adapted to be selectively operated by a purchaser, coin-freed means actuated by one of said manually operated means for initiating the ejection of an article from a container, manually-operable coin-return means for returning coins deposited in said coin-freed means to the purchaser, and means responsive to the operation of a manually-operated selecting means for rendering said coin-return means inoperative.

18. A vending machine including in combination a plurality of containers in which articles to be vended are adapted to be stacked, a plurality of ejectors each adapted to eject an article from a respective stack, an operating member mounted for reciprocating motion, a prime mover, means for initiating the action of said prime mover, means driven by the prime mover for reciprocating the operating member, a plurality of coupling members carried by the operating member for selectively connecting it to a predetermined ejector, a plurality of manually-operated selecting means corresponding to the plurality of containers adapted to be selectively operated by a purchaser, cams movable by respective manually-operated selecting means for actuating respective coupling members, an elongated pivoted member extending adjacent all of said cams, a plurality of co-acting means carried by said cams and said elongated pivoted member for rotating said pivoted member in response to movement of any one of said cams, a coin-freed means, a link connected to said pivoted member for initiating the action of said coin-freed means, means responsive to the action of said coin-freed means for holding said link in action-initiating position and for actuating said means for initiating said prime mover, retaining means for holding said pivoted member in coin-freed initiating-action position and means responsive to the movement of said operating member for releasing said holding means and simultaneously actuating said retaining means whereby the cycle of operation of said prime mover once initiated will be completed.

19. A vending machine including in combination a plurality of containers in which articles to be vended are adapted to be stacked, a plurality of ejectors each adapted to eject an article from respective containers, an operating member, a plurality for coupling members carried by said operating member for selectively connecting it to a predetermined ejector, one of said containers containing articles vending at a lower price than articles in another container, a plurality of manually-operated selecting means adapted to actuate corresponding coupling members, coin-freed means for preventing the initiation of the operation of said operating member adapted to be freed by a coin of predetermined denomination, a coin reservoir adapted to hold coins of lower value than the coin of predetermined denomination, means for dispensing a coin of lower denomination from said reservoir, means associated with a manually-operated selecting means corresponding to a stack of articles vending at a lower price for operating said lower-valued coin-dispensing means upon the freeing of said coin-freed means whereby a purchaser will receive an article and a coin representing the difference in value between the price of the article and the value of the coin of larger denomination deposited in said coin-freed means.

20. A vending machine as in claim 19 including in combination an auxiliary coin reservoir, dispensing means for said auxiliary reservoir, normally inoperative means responsive to the actuation of said operating member for operating said auxiliary dispensing means, feeler means associated with said first coin reservoir and means responsive to the movement of said feeler means upon the depletion of coins in said first reservoir for rendering said auxiliary dispensing means operative.

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