Oct. 25, 1960 C. GABRIELSEN 2,957,568

MECHANICAL COIN TOTALIZER

Filed July 6, 1955 6 Sheets-Sheet 1

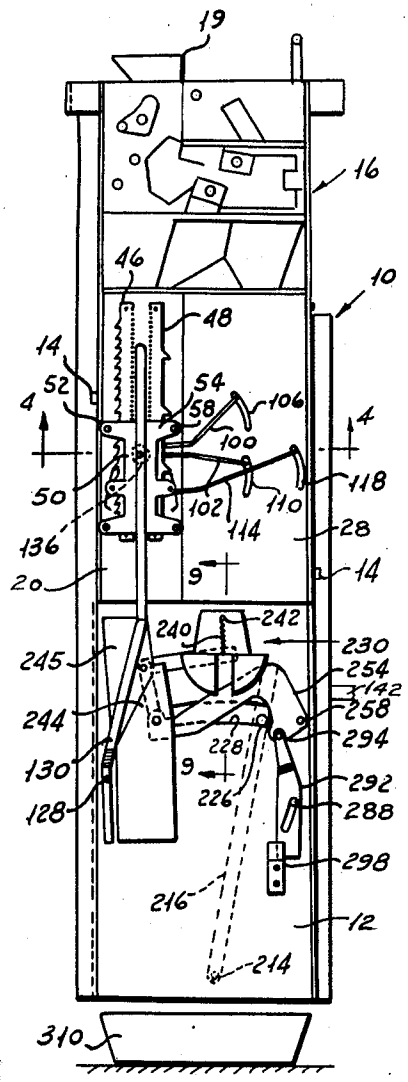

Fig 1

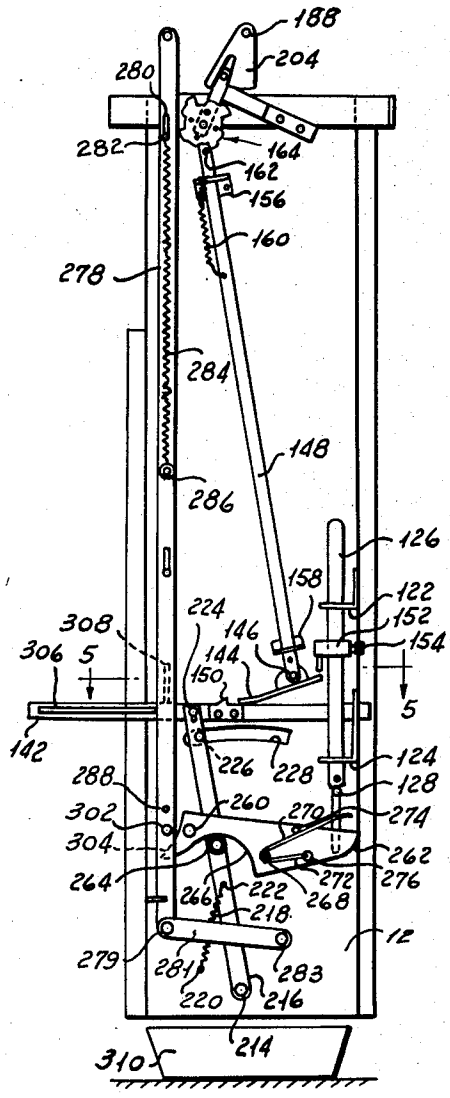

Fig 2

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MECHANICAL COIN TOTALIZER

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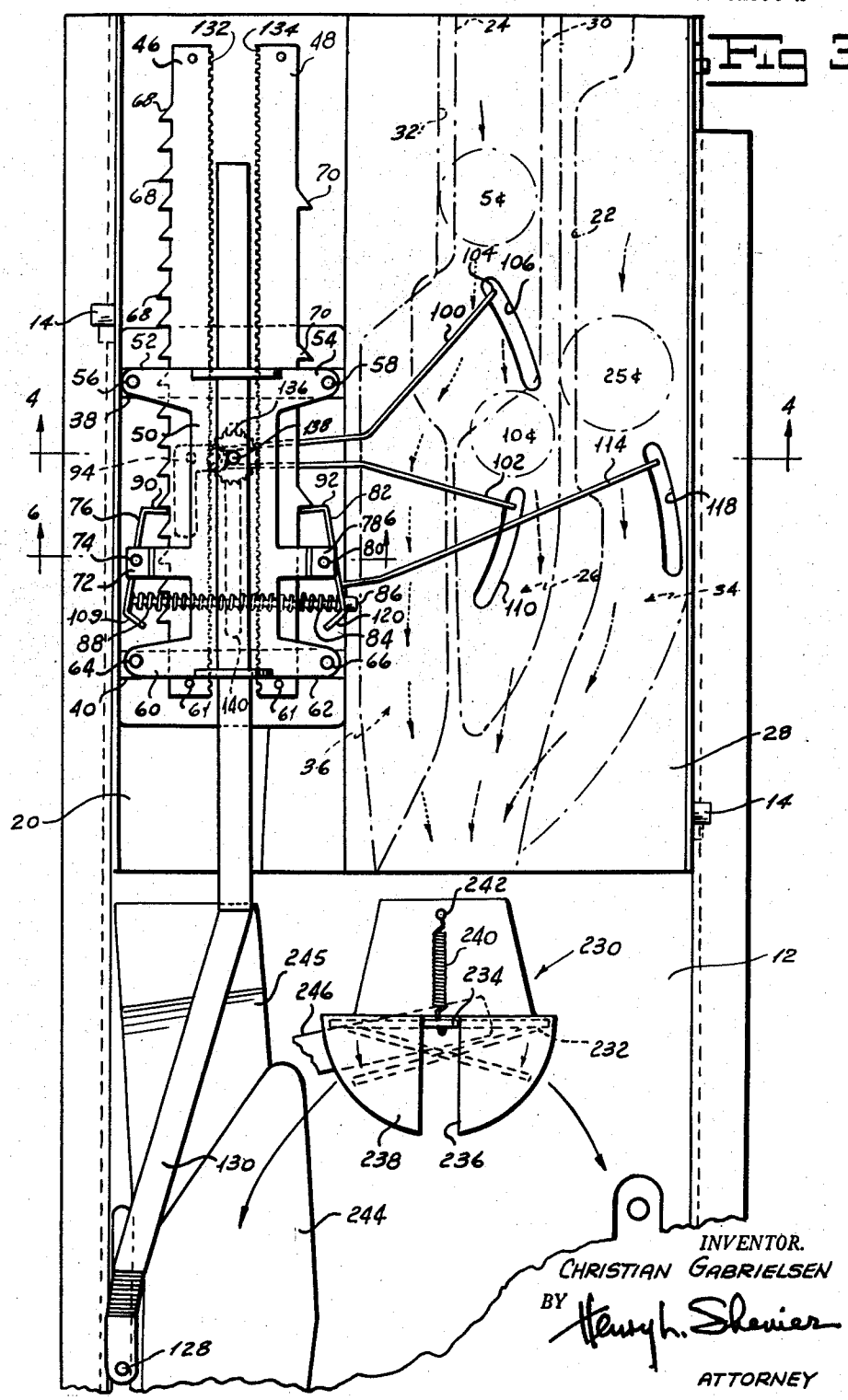

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MECHANICAL COIN TOTALIZER

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FIG 4

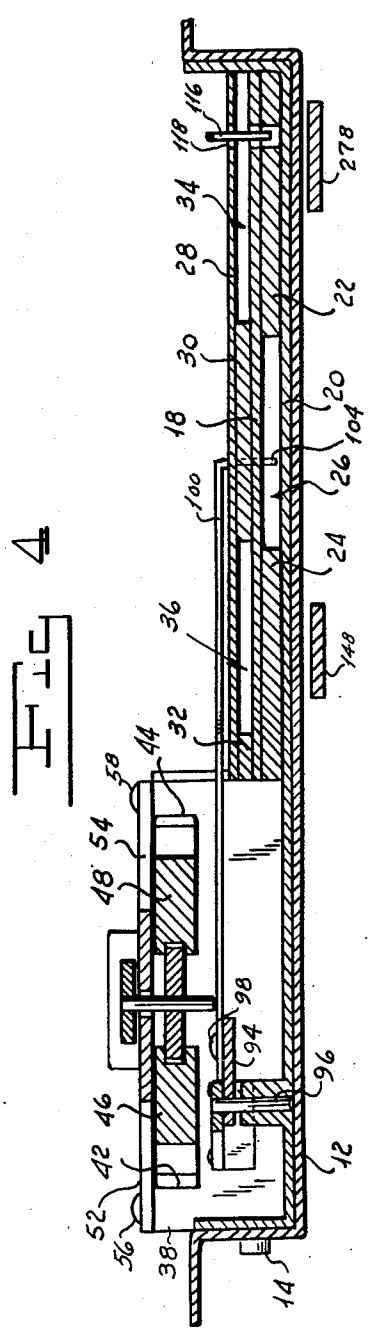
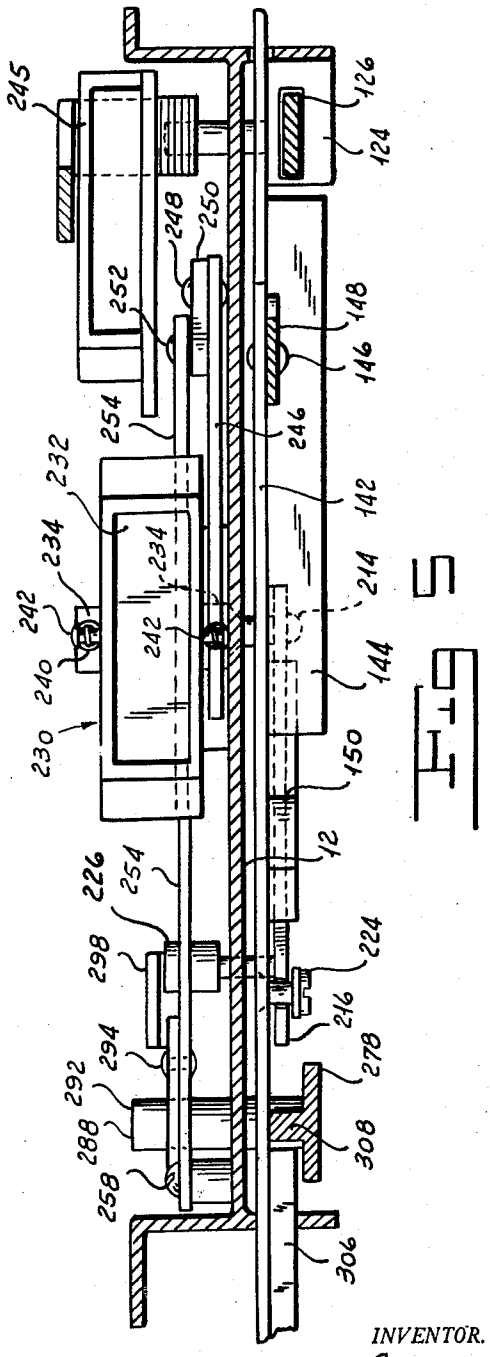


FIG 5



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Oct. 25, 1960 C. GABRIELSEN 2,957,568

MECHANICAL COIN TOTALIZER

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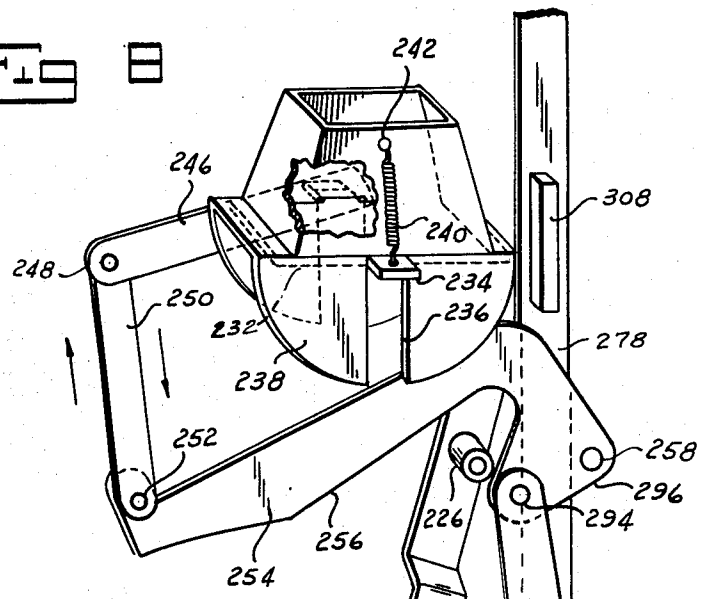
Fig 8



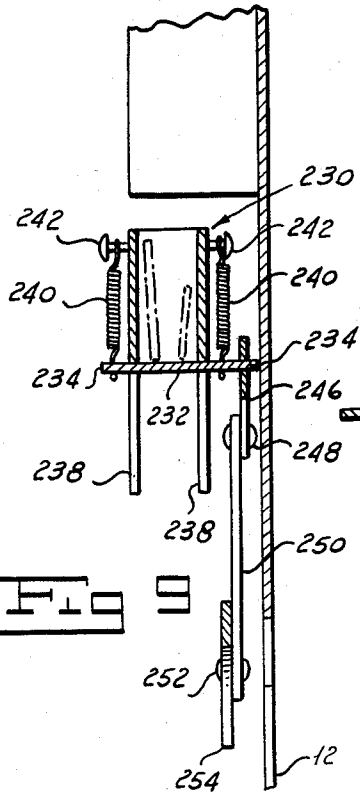


Fig 9

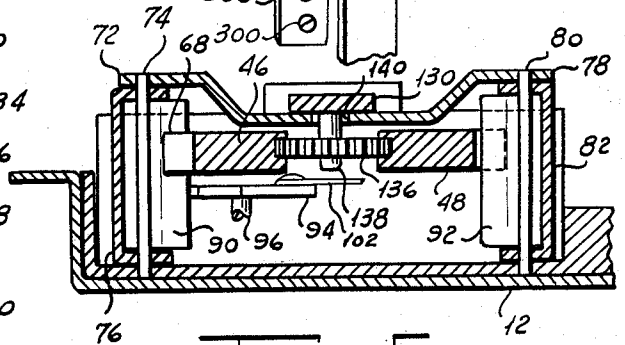


Fig 6

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MECHANICAL COIN TOTALIZER

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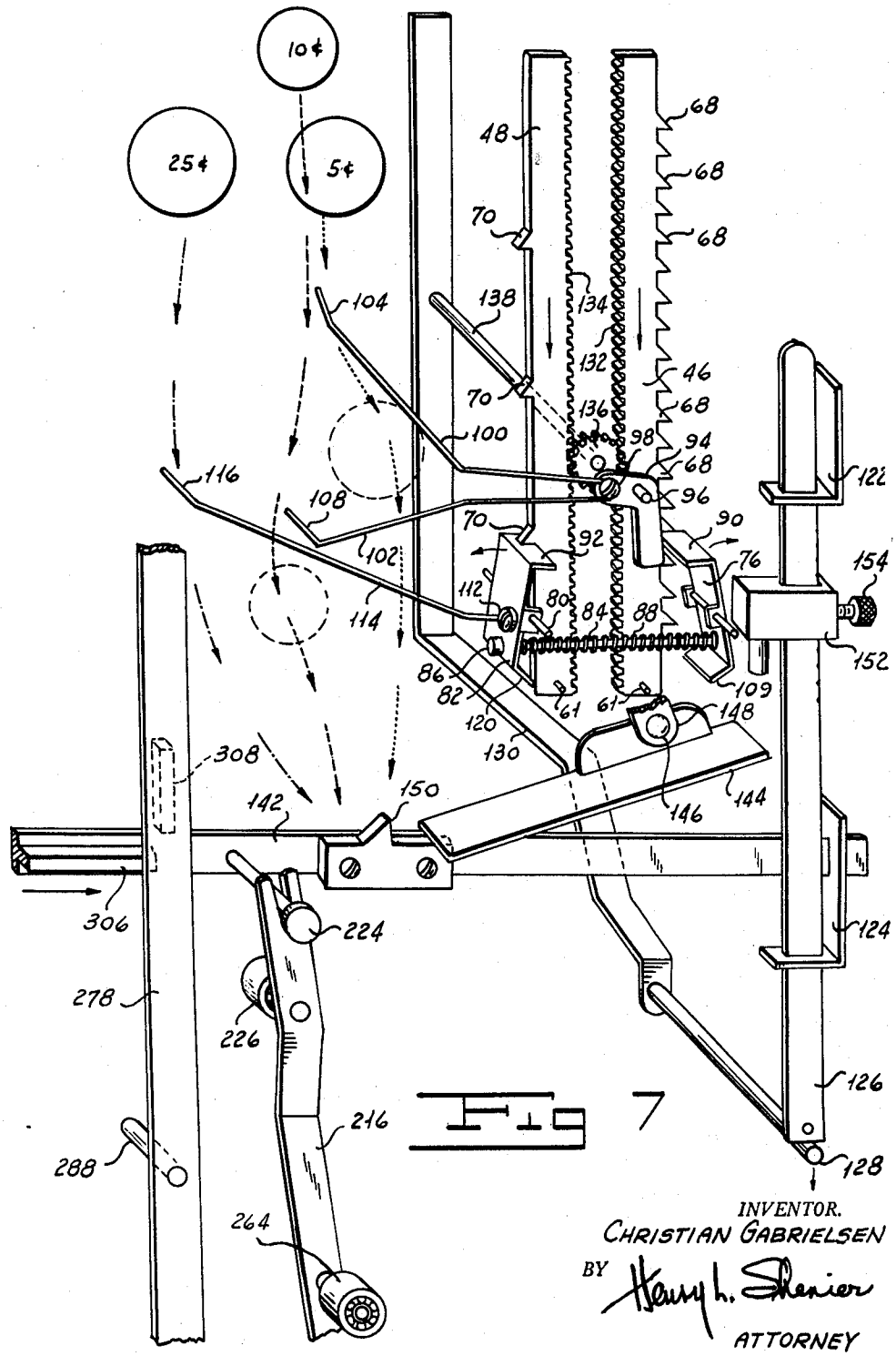

FIG 7

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MECHANICAL COIN TOTALIZER

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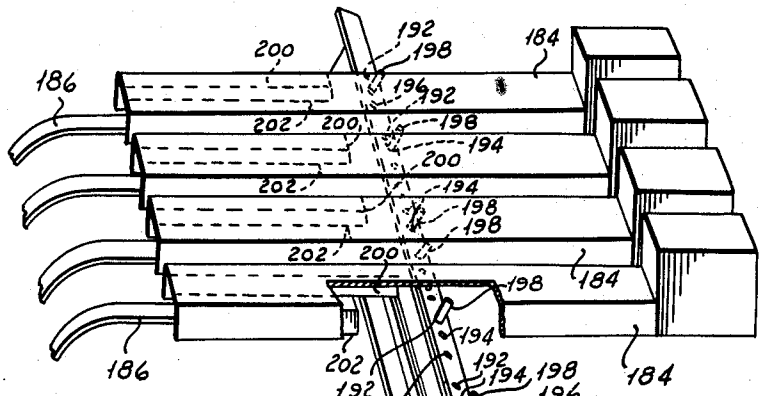


FIG 10

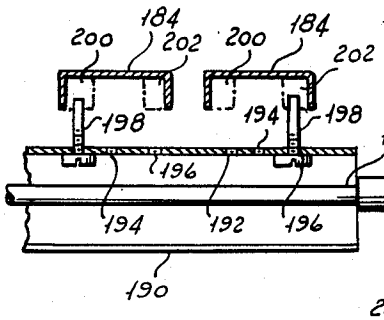
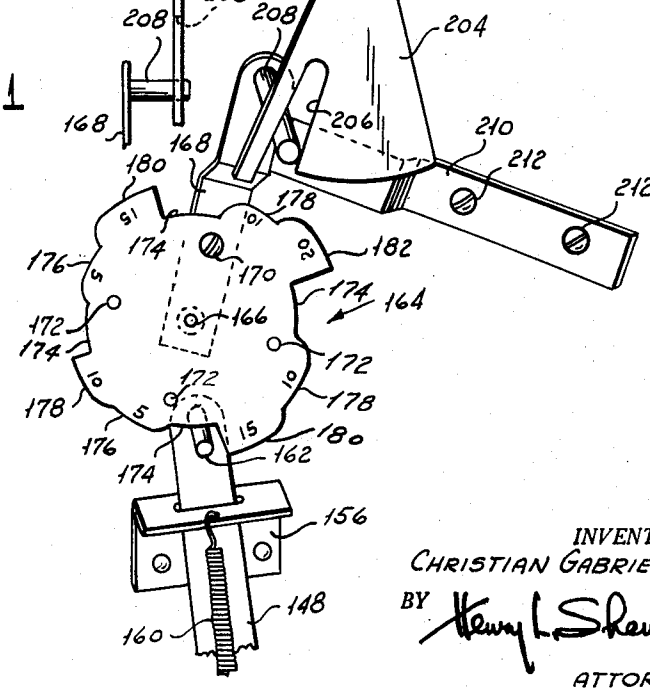


FIG 11



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United States Patent Office 2,957,568 Patented Oct. 25, 1960

2,957,568

MECHANICAL COIN TOTALIZER

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

Filed July 6, 1955, Ser. No. 520,263

14 Claims. (Cl. 194—18)

My invention relates to a coin totalizer and more particularly to a mechanical coin totalizer for use with merchandising machines for dispensing differently priced merchandise such as, for example, various types and brands of cigarettes selling at different prices.

It will be understood my coin totalizer may be employed with any merchandising machine. For purposes of convenience, I will describe my totalizer in connection with a cigarette machine. There is a presently existing high demand for a large number of different types of cigarettes, such, for example, as regular size, "king" size, and filter tip cigarettes, of various brands. Many of the various brands and types of cigarettes sell at different prices. In order to meet the market demand, a cigarette merchandising machine must sell a large number of different types and brands of cigarettes at various prices. The coin totalizer of the machine must release the operating mechanisms associated with the respective types and brands of cigarettes in response to the deposit in the machine of different sums of money. In order that the machine may be installed in any location, the coin totalizer should be a mechanical device, not relying on an independent source of electric power. The totalizer should be sensitive to prevent more than a corresponding movement of its mechanism in response to the deposit of a coin in accordance with its value. The action of the totalizer must be rapid to register all coins deposited in the machine irrespective of how rapidly the coins are deposited. The totalizer must receive and register sums in coins to any reasonable amount in all and sundry combinations of the common five-cent, ten-cent, and twenty-five-cent coins.

I have invented a mechanical coin totalizer for use with cigarette merchandising machines and the like adapted to dispense a large number of different types and brands of cigarettes selling at various prices. My totalizer is certain in operation. It is sensitive to all coins and permits only corresponding movement of its mechanism for each coin deposited in the machine in accordance with its value. My totalizer registers all coins deposited in the machine without regard to the speed with which coins are inserted in succession in the machine. My totalizer is mechanical and relies on no external source of electric power.

One object of my invention is to provide a mechanical coin totalizer for releasing the respective operating mechanism associated with the various types and brands of cigarettes contained in a cigarette merchandising machine in response to the deposit in the machine of different predetermined respective sums in a coin or coins.

Another object of my invention is to provide a mechanical coin totalizer which allows respective movements of the totalizer mechanism in accordance with the value of each deposited coin.

Yet another object of my invention is to provide a mechanical coin totalizer which registers the total of all coins deposited in a merchandising machine without regard to the speed with which the coins are deposited in the machine.

A further object of my invention is to provide a mechanical coin totalizer for receiving and registering sums in coins to any reasonable amount in all and sundry combinations of five-cent, ten-cent, and twenty-five-cent coins. A further object of my invention is to provide a coin register having a releasing member whose displacement is the analogue of the value of coins dsposited.

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

In general, my invention contemplates the provision of a mechanical coin totalizer including a register bar. Stop means normally prevents operation of the machine. The arrangement is such that predetermined movement of the register bar restores the stop means. I provide mechanical means responsive to the deposit in the register of coins aggregating the purchase price of an article of merchandise contained in the machine for causing movement of the register bar to release the stop means to permit actuation of the machine to deliver an article of merchandise to a customer. Means responsive to the operation of the machine selecting means actuate an additional price differential means supplementing that provided by the register bar. An escrow bucket receives coins from the totalizer and retains them until a sale is made or until the machine coin return is actuated. The movement of the register bar is the analogue of the aggregate value of the coins deposited.

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 an elevation of one side of my mechanical coin totalizer.

Figure 2 is an elevation of the other side of my mechanical coin totalizer.

Figure 3 is a fragmentary side elevation of my mechanical coin totalizer drawn on an enlarged scale.

Figure 4 is a sectional view of my mechanical totalizer drawn on an enlarged scale, and taken along the line 4—4 of Figure 3.

Figure 5 is a sectional view of my mechanical coin totalizer drawn on an enlarged scale and taken along the line 5—5 of Figure 2.

Figure 6 is a fragmentary sectional view drawn on an enlarged scale, and taken along the line 6—6 of Figure 3 of my mechanical coin totalizer.

Figure 7 is a fragmentary perspective view with parts removed of the register bar release means of my mechanical coin totalizer.

Figure 8 is a fragmentary perspective view with parts removed and other parts broken away of the escrow bucket and actuating means of my mechanical coin totalizer.

Figure 9 is a fragmentary sectional view, drawn on an enlarged scale, and taken along the line 9—9 of Figure 1 of the escrow bucket of my mechanical coin totalizer.

Fig. 10 is a fragmentary perspective view with parts removed and other parts broken away of the price differential means of my mechanical coin totalizer, shown in association with a portion of a merchandising machine.

Figure 11 is a fragmentary sectional view of the actuating means for the price differential means of my mechanical coin totalizer, shown in association with a portion of a merchandising machine.

More particularly referring now to Figures 1 to 5 of the drawings, the assembly, indicated generally by the reference character 10, with which my coin totalizer is used includes a flanged support plate 12 carrying projec-

tions 14 by means of which the register is mounted in the merchandising machine cabinet (not shown). Plate 12 mounts adjacent to its top a coin separator and slug ejector, indicated generally by the reference character 16 for receiving coins deposited in the machine through a coin slot 19. Separator and slug ejector 16 may be of any type known to the art which separates nickels, dimes, and quarters deposited in the machine, which tests the deposited coins and ejects spurious coins from the machine.

A pair of plates 18 and 20 maintained in spaced relationship by spacers 22 and 24 form a dime coin passage, indicated generally by the reference character 26. A third plate 28 held in spaced relationship with plate 18 by spacers 30 and 32 forms respective quarter and nickel coin passages, indicated generally by the reference characters 34 and 36. I mount the assembly including plates 18, 20, and 28 and spacers 22, 24, 30, and 32 on the support plate 12 by any convenient means to position passages 26, 34, and 36, respectively, to receive dimes, quarters, and nickels from the outlet passages of the coin separator and slug ejector 16.

Respective guide members 38 and 40 fixed in spaced relation to plate 20 to the left of the coin passages as viewed in Figures 3 and 4 are each formed with a pair of vertical guide slots 42 and 44 which slidably mount respective racks 46 and 48. A retaining plate 50 formed with a first pair of ears 52 and 54 secured to guide member 38 by respective screws 56 and 58 retains racks 46 and 48 in guide slots 42 and 44. I secure a second pair of ears 60 and 62 formed on retaining plate 50 to guide member 40 by respective screws 64 and 66. Rack 46 is formed with spaced escapement teeth 68 along its length. Rack 48 is formed with spaced escapement teeth 70 along its length. As can be seen by reference to Figure 3, the spacing between the escapement teeth 70 on rack 48 is much greater than is the spacing between the escapement teeth 68 on rack 46. The spacing of the escapement teeth on the respective racks are a function of increments of coin values as will be explained in detail hereinafter.

I provide a pair of escapement mechanisms for permitting a predetermined movement downward of racks 46 and 48 under the influence of gravity. A laterally extending bracket 72 formed on plate 50 carries a pin 74 which pivotally mounts an escapement latch 76 associated with rack 46. A second laterally extending bracket 78 formed on plate 50 carries a pin 80 which pivotally mounts a second escapement latch 82 associated with rack 48. An elongated screw 84 has one end threadably fixed in latch 76 below pin 74. The other end of screw 84 extends through an opening in latch 82 below pivot 80 and is formed with a head 86. A coil spring 88 carried by the shank of screw 84 bears between latches 76 and 82 below the pivots to urge them, respectively, in a clockwise and in a counterclockwise direction as viewed in Figure 3. The head 86 of screw 84 limits the relative pivotal movement of the two latches 76 and 82 about their respective pivots 74 and 80. The length of screw 84 is such that spring 88 normally urges the respective latches 76 and 82 to positions where arms 90 and 92 formed at the upper ends thereof, respectively, engage an escapement tooth 68 of rack 46 and an escapement tooth 70 of rack 48.

I provide means for pivoting escapement latches 76 and 82 to permit a selected predetermined downward movement under the influence of gravity of racks 46 and 48 in response to the passage of coins through the respective passages 26, 34, and 36. As can best be seen by reference to Figures 1, 3, and 7, I pivotally mount a bell crank 94 on a pin 96 carried by plate 20. A screw 98 secures a pair of feelers 100 and 102 to an arm of bell crank 94 for movement therewith. A lateral projection 104 on feeler arm 100 extends through an arcuate opening 106 in plate 28 so as to extend into the five-cent coin passage 36 and into the ten-cent coin passage 26. I so shape the separators 30 and 32 forming the coin passage 36 that a nickel entering passage 36 passes downwardly to engage the projection 104 of feeler 100. After having engaged this feeler it is directed to the left as viewed in Figure 3, of the projection 104 on arm 100 and downwardly and out of the coin passage. As a nickel engages projection 104 in its passing downwardly through the passage 36, it rotates feeler 100 and bell crank 94 in a clockwise direction as viewed in Figure 3 and a counterclockwise direction as viewed in Figure 7. The arm of bell crank 94 other than that on which feeler 100 is secured engages arm 90 of escapement latch 76 when a five-cent coin pivots bell crank 94. This action of bell crank 94 pivots escapement latch 76 against the action of spring 88 in a counterclockwise direction as viewed in Figure 3 and in a clockwise direction as viewed in Figure 7 to move latch arm 90 out of engagement with an escapement tooth 68 of rack 46 to permit a downward movement of rack 46 under the influence of gravity. When arm 90 moves out of engagement with an escapement tooth 68 to permit rack 46 to feed downwardly, a second latch arm 109 on the other end of escapement latch 76 moves into engagement with an escapement tooth 68 on rack 46 to limit the extent of the downward motion. After the coin passes by the projection 104 on feeler 100 spring 88 pivots escapement latch 76 in a clockwise direction as viewed in Figure 3 about its pivot pin 74 to move latch arm 90 into engagement with the escapement tooth 68 on rack 46 above the tooth which arm 90 engaged before it was released. It will be seen that actuation of feeler 100 by a five-cent coin passing downwardly through passage 36 results in a downward movement of rack 46 under the influence of gravity through a distance equal to the distance between the leading edges of adjacent escapement teeth 68.

As has been explained hereinabove, projection 104 on feeler 100 also extends into the dime passage 26 formed by plates 18 and 20 and spacers 22 and 24. Spacers 22 and 24 are so formed that a dime passing into passage 26 is first directed to engage projection 104 and actuate feeler 100 to permit a downward feed of rack 46 through a distance equal to the distance separating the leading edges of a pair of adjacent escapement teeth 68. Feeler 102 carried by screw 98 on bell crank 94 is formed with a lateral projection 108 extending into the dime coin passage 26 through a pair of arcuate slots 110 formed, respectively, in plates 28 and 18. The disposition of arm 102 is such that projection 108 extends across the dime coin passage 26 below projection 104. After a dime traveling downwardly through passage 26 engages and actuates feeler 100, it travels farther along the passage to engage projection 108 on arm 102. This engagement results in a second actuation of escapement latch 76 which was reset by spring 88 after the ten-cent coin passed by projection 104. It will be seen that a ten-cent coin passing downwardly through passage 26 first engages projection 104 to actuate feeler 100 to release latch 76 to permit a single downward step of rack 46 and then engages projection 108 to actuate feeler 100 to release escapement latch 76 to permit a second downward step of rack 46. Rack 46 moves downwardly stepwise in response to passage of a ten-cent coin through passage 26 through twice the distance it moves downwardly in response to the passage of a five-cent coin through passage 36.

A screw 112 secures a feeler 114 to escapement latch 82 at a point below pivot pin 80. A laterally extending portion 116 on feeler 114 extends through an arcuate slot 118 in plate 28 into the quarter coin passage 34 formed by plates 28 and 19 and spacer 30. A quarter traveling downwardly through passage 34 engages portion 116 of feeler 114 and moves it dowwardly as viewed in Figure 3. This downward movement of the feeler pivots escapement latch 82 in a clockwise direction as

viewed in Figure 3 and in a counterclockwise direction as viewed in Figure 7 about pivot 80 against the action of spring 88. When escapement latch 82 pivots, its arm 92 moves out of engagement with an escapement tooth 70 of rack 48 to permit a downward movement of rack 48 under the influence of gravity. This pivotal movement of latch 82 moves a second arm 120 formed on latch 82 to a position when it engages the escapement tooth 70 released by arm 92 to arrest the downward movement of rack 48. After the quarter has passed by portion 116 of feeler 114, spring 88 resets latch 82 by engaging arm 92 with the escapement tooth 70 above the tooth 70 which was released by the arm 92 when the latch 82 was actuated. For purposes of clarity I have indicated the paths of travel of nickels, dimes, and quarters through the passages, respectively, by a dotted line, a broken line, and a dot-dash line in Figures 3 and 7.

As can be seen by reference to Figures 2 and 7, a pair of brackets 122 and 124 carried by support plate 12 slidably mounts a register bar 126 for vertical sliding movement by means of slots formed in the brackets. The lower end of bar 126 as viewed in Figure 2 rests on a pin 128 carried by the lower end, as viewed in Figure 3, of a bent link 130. Respective rows of gear teeth 132 and 134 on racks 46 and 48 engage and support a pinion 136 fixed on a rod 138 for rotation with it. The end of rod 138 remote from pinion 136 is rotatably mounted in the upright portion of link 130. Rod 138 extends through a slot 140 formed in plate 50. From the structure just described, it will be seen that pinion 136, which is supported between racks 46 and 48, supports link 130 carrying pin 128 on which the register bar 126 rests. When either of the racks 46 or 48 is permitted to move downwardly under the influence of gravity, pinion 136 moves downwardly as viewed in Figures 3 and 7 and carries link 130 and pin 128 down with it. As pin 128 moves downwardly, register bar 126 is permitted to move downwardly under the influence of gravity.

My coin totalizer includes a stop or locking bar 142 slidably mounted for horizontal movement in a slot in bracket 124. In order that the operating mechanism (not shown) of the machine with which my totalizer is employed be operated, bar 142 must move to the right as viewed in Figure 2. A stop pawl 144 pivotally mounted on a pin 146 on the end of a price differential rod 148 normally rests by gravity on the upper surface of bar 142 as viewed in Figure 2. When the operating mechanism of the merchandising machine is actuated, bar 142 tends to move to the right as viewed in Figure 2. In the course of this movement a projection 150 on bar 142 engages stop pawl 144 to arrest movement of bar 142 and prevent the operation of the merchandising machine to prevent a package of mechandise from being dispensed.

Register bar 126 carries a stop 152 adjustably positioned on the bar by a set screw 154. After a predetermined downward movement of bar 126, stop 152 engages pawl 144 to pivot it in a clockwise direction about pin 146. When the register bar 126 moves a sufficient distance downwardly as viewed in Figure 2, stop pawl 144 moves out of the path of the projection 150 and the operating mechanism of the machine is freed to permit an article of merchandise to be dispensed. As has been explained hereinabove, movement of either of the racks 46 or 48 downwardly in response to the passage of coins through passages 36, 26, and 34 moves pinion 136 downwardly to move link 130 and pin 128 downwardly to permit the register bar 126 to move down. It will be seen that stop 152 is positioned to move pawl 144 to free bar 142 in response to the deposit of a predetermined sum in coins in the machine.

When stop 152 has been located on bar 126, all articles of merchandise in the machine may be sold at a single price. I provide a price differential means which permits various types and brands of cigarettes or other merchandise to be sold at different prices. Referring more particularly to Figures 2, 10, and 11, a pair of brackets 156 and 158 carried by support plate 12 by any convenient means slidably mount the price differential rod 148 for substantially vertical sliding movement. A spring 160 fixed between rod 148 and bracket 156 normally urges rod 148 upwardly as viewed in Figure 2 to engage a pin 162 at the upper end of rod 148 with the surface of a price differential cam, indicated generally by the reference character 164. A shaft 166 pivotally mounts cam 164 on plate 12. Depending upon the location of the surface of cam 164 engaged by pin 162, pawl 144 is moved out of the path of projection 150 upon a certain predetermined movement of the register bar 126 carrying stop 152. It will be appreciated that a base price corresponding to the lowest price of an article of merchandise to be sold is set into my totalizer by properly positioning stop 152 to move pawl 144 out of engagement with projection 150 on the deposit in the machine of coins aggregating the lowest price when pin 162 engages the base or zero price differential level 174 on the surface of cam 164. If pin 162 is in engagement with another surface of cam 164, register bar 126 must move a further distance downwardly as viewed in Figure 2 before pawl 144 moves out of the path of projection 150 to free the lock bar 142. This requires deposit of a greater sum in coins in the machine.

I provide means associated with the various selecting means of the machine for actuating cam 164 to move various levels on its surface into engagement with pin 162 to position pawl 144 to provide a price differential. Shaft 166 pivotally mounts a cam drive crank 168. A screw or the like 170 passing through one of a number of locating holes 172 in cam 164 engages cam 164 with crank 168 for movement therewith. I form the peripheral surface of cam 164 with five levels 174, 176, 178, 180 and 182 corresponding, respectively, to no price differential and price differentials of from five cents to twenty cents in five-cent steps. It is to be noted that locating holes 172 divide cam 164 into four segments. The surface of each segment includes a zero price differential level and a pair of different price differential levels. In any position of cam 164 with respect to the crank 168, two price differentials are provided enabling a merchandising machine with which my totalizer is used to operate at three different prices. In the position of crank 168 shown in Figure 10, a five-cent and ten-cent price differential are provided. The location of screw 170 in the other various holes 172 provides other respective price differential combinations. A five-cent and a fifteen-cent price differential are provided in one position; a ten-cent and a twenty-cent price differential are provided in another position; and a ten-cent and a fifteen-cent price differential are provided in another position.

With pin 162 engaging the level 174 of the surface of any segment of cam 164, no price differential is provided. Rotation of cam 164 in a counterclockwise direction as viewed in Figure 10 successively engages pin 162 with the other price differential levels of the segment being used. With screw 170 locating cam 164 with respect to crank 168 as shown in Figure 10, rotation of cam 164 in a counterclockwise direction successively engages the five-cent level 176 and the ten-cent level 178 with pin 162. I provide means for stepping cam 164 in response to the operation of the machine selecting mechanism to provide a price differential if one is desired.

By way of example, the merchandising machine with which my coin totalizer is to be used may include a number of selecting pull bars 184 corresponding to the various types and brands of merchandise to be sold as is known in the art. Flexible tapes 186 connected to the operating mechanism of the machine (not shown) or other appropriate means normally urge selecting bars 184 to the left as viewed in Figure 10 to nonoperating position. A shaft 188 mounted on the machine frame (not shown)

carries a price differential pin mounting bracket **190**. Groups of three holes **192**, **194**, and **196** are located in bracket **190** at positions corresponding to the location of each of the selecting bars **184**. Each of a number of price differential pins **198** associated with the respective groups of holes is mounted in the center hole **194** to provide no price differential or in one of the side holes **192** and **196** to provide one of two price differentials. Each of the bars **184** is channel shaped in cross section and carries on its underside a pair of pin actuating members **200** and **202**. When a dispensing operation is performed, a bar **184** is moved to the right as viewed in Figure 10. A pin **198** located in a center hole **194** will not be engaged by either of the members **200** or **202** but will pass between them. When a bar **184** moves to the right, its member **200** engages a pin **198** located in hole **192** to rotate shaft **188** in a clockwise direction as viewed in Figure 10. Similarly, as a bar **184** moves to the right, member **202** engages a pin located in hole **196** to pivot shaft **188** in a clockwise direction. As can be seen by reference to Figure 10, member **200** is longer than member **202**. In the course of movement of a bar **184** a member **200** engages a properly positioned pin **198** to pivot the pin until it rides along the undersurface of the member **200**. The movement of each bar **184** is limited so that a member **202** which engages a properly positioned pin **198** pivots the pin through only a portion of the arc through which a pin **198** pivots under the action of a member **200**. As a result, the engagement of a pin **198** by a member **200** results in a rotation of shaft **188** through a greater angle than does the engagement of a pin **198** by member **202**. Thus the location of the pin **198** associated with a group of holes in the hole **192** results in a greater rotation of shaft **188** than does the location of the pin **198** in hole **196**.

A crank plate **204** carried by shaft **188** for rotation therewith is formed with a slot **206** in which a pin **208** carried by crank **168** rides. When crank plate **204** rotates in a clockwise direction as viewed in Figure 10, it drives crank **168** to rotate cam **164** in a counterclockwise direction. It will be seen that rotation of crank plate **204** to rotate cam **164** when a member **200** or **202** engages a pin **198** engages a price differential surface with pin **162** to urge rod **148** downwardly as viewed in Figures 2 and 10. With crank **168** located with respect to cam plate **164** as shown in Figure 10, engagement of a member **202** with a pin **198** in a hole **196** moves price differential surface **176** in engagement with pin **162** and provides a plus five-cent price differential. Engagement of a member **200** with a pin **198** in a hole **192** moves surface **178** into engagement with pin **162** to provide a plus ten-cent price differential.

Movement of link **148** downwardly moves the pivot **146** of pawl **144** downwardly as viewed in Figure 2. As a result of this movement, the register bar **126** carrying stop **152** must move a greater distance downwardly before it engages pawl **144** to move its end out of the path of projection **150** to permit movement of rod **142**. To accomplish this additional downward movement of bar **126**, additional coins must be inserted in the coin slot **19**. With the parts in the position shown, if a member **202** engages a pin **198** upon actuation of a selecting pull bar **184** to move level **176** into engagement with pin **162**, an additional nickel to the base price determined by the setting of stop **152** must be inserted in slot **19** before stop **152** engages pawl **144** to move it out of the side of projection **150**. If a member **200** engages a pin **198** upon actuation of a pull bar **184** to engage level **178** with pin **162**, an additional ten cents to the base price must be inserted in slot **19** before bar **142** is freed to permit a dispensing operation to take place. After an actuated pull bar **184** is released upon completion of a dispensing operation, spring **160** urges rod **148** upwardly. The engagement of pin **162** with the surface of cam **164** is such that spring **160** returns the price differential cam **164** and its drive means to the initial position. A stop **210** mounted on the register frame by screws **212** limits the movement of crank **168** under the influence of spring **160**. It will be understood that if other differentials from the base price than those provided by levels **176** and **178** are desired, cam **164** must be reoriented on crank **168** to position a different sector of the cam to act on pin **162**. This is readily done by removing screw **170**, changing price differential cam position and reinserting screw **170**.

Referring now to Figure 2 a pin **214** carried by mounting plate **12** pivotally mounts a register return arm **216**. A spring **218** fixed between a pin **220** on plate **12** and a pin **222** on arm **216** normally biases arm **216** to pivot in a counterclockwise direction as viewed in Figure 2. The bifurcated upper end of arm **216** engages a pin **224** carried by bar **142**. As has been explained hereinabove, when pawl **144** has been actuated to permit movement of bar **142** and a dispensing operation is performed, bar **142** moves to the right as viewed in Figure 2. It will be seen that this movement takes place against the action of spring **218**. When the dispensing operation is complete and the dispensing mechanism (not shown) has returned to its initial position, spring **218** moves bar **142** to the left to the position shown in Figure 2. A money dump cam roller **226** carried by arm **216** rides in an arcuate slot **228** formed in plate **12** to limit the movement of arm **216** in either direction.

Referring now to Figures 1, 3, 5, 8 and 9, after having passed through the coin passages **26**, **34**, and **36** to actuate the coin totalizer price mechanism in the manner described hereinabove, coins pass into an escrow bucket, indicated generally by the reference character **230**, in which the coins are held for acceptance when a customer actuates a selector pull bar **184** to perform a dispensing operation or for return to the customer if he actuates the coin return lever of the machine before the dispensing operation. I mount bucket **230** on plate **12** by any convenient means such as a bracket or the like. As can best be seen by reference to Figures 3, 8 and 9, the escrow bucket **230** includes a bottom plate **232** formed with lateral ears **234** extending through slots **236** formed in flanges **238** extending downwardly from the sides of the bucket. Respective springs **240** each secured at one end to an ear **234** and at the other end to a pin **242** in a bucket side normally urge bottom plate **232** to close the bucket. If bottom plate **232** tilts in a counterclockwise direction about one edge thereof as viewed in Figure 3, coins pass out of one side of the bottom of the bucket to be directed by a baffle **244** into the coin return chute of the machine. If plate **232** tilts about its left-hand edge in a clockwise direction as viewed in Figure 3, coins pass out of the other side of the bottom of bucket **230** into a suitable coin receptacle or box.

As can best be seen in Figure 8, in order to tilt the plate **232** to accept or return coins, I connect a crank arm **246** to an ear **234** at one side of bucket **230** by means such as a slot or the like. A pin **248** connects a link **250** to arm **246**. A pin **252** connects the other end of link **250** to a coin bucket actuation lever **254** formed with a cam surface **256** on its underside. A pivot **258** mounts lever **254** on plate **12**. As has been explained hereinabove, when a dispensing operation is performed after deposit of an appropriate sum in coins, bar **142** moves to the right as viewed in Figure 2. In the course of its movement, bar **142** moves arm **216** in a clockwise direction about its pivot **214** as viewed in Figure 2. In the course of this movement, cam roller **226** carried by arm **216** engages cam surface **256** to pivot lever **254** in a clockwise direction about its pivot **258** as viewed in Figure 8. This movement pivots bottom plate **232** about its left-hand edge as viewed in Figures 3 and 8 to permit coins contained in the bucket to fall out of the right-hand side of the bottom of the bucket and into a suitable receptacle **310**.

As can best be seen by reference to Figure 2, a pivot pin **260** pivotally mounts a register bar return lever **262** on plate **12**. In the course of the movement of arm **216** to accept coins deposited in the machine, a cam roller **264** carried by arm **216** engages a cam surface **266** formed on the underside of lever **262** to pivot the lever in a counterclockwise direction as viewed in Figure 2 about its pivot **260**. A screw **268** on lever **262** carries a spring, the respective arms **270** and **272** of which engage fixed pins **274** and **276** on lever **262**. It will be remembered that in totalizing coins deposited in the machine, register bar **126** and rod **128** move downwardly. As lever **262** pivots under the influence of roller **264**, spring arm **270** engages rod **128** and resiliently urges it to return to its initial position. Spring arm **270** provides a resilient return for register bar **126** to ensure that all deposits are canceled before lever **262** reaches the limit of its pivotal movement. It will be appreciated that this action drives floating pinion **136** to return both racks **46** and **48** to their initial positions. This is permitted readily owing to the shape of the escapement teeth. Pins **61** carried by respective racks **46** and **48** acting in cooperation with retaining plate ears **60** and **62** limit the upward travel of the racks. Thus, for example, in resetting if rack **46** lags behind rack **48**, this rack will reach the limit position first and stop. Then continued motion of the pinion shaft **138** will carry the pinion over the now stationary rack teeth of rack **48**. This rotates the pinion **136** and drives the other rack **46** to its limit position. From the foregoing description it will be seen that movement of arm **216** under the influence of bar **142** when a dispensing operation is performed actuates bottom plate **232** to accept coins and drives register bar **126** and the escapement racks **46** and **48** to their initial positions. The coin totalizer is then ready for another operation.

As can be seen in Fig. 2 the machine with which my coin totalizer is used includes a coin return mechanism for actuating a coin return drive link **278** formed with a slot **280** by means of which the link **278** is slidably mounted on a pin **282** carried by plate **12**. A pin **279** pivotally connects link **278** with an arm **281** pivotally mounted on plate **12** by a pin **283**. A spring **284** fixed between pin **282** and a pin **286** carried by link **278** normally urges the link upwardly. When a customer actuates the coin return of the machine, link **278** moves downwardly. As can be seen in Fig. 8 link **278** carries a pin **288** which passes through a suitable opening in plate **12** to engage a slot **290** in a bent link **292** carried by a pivot pin **294** on an arm **296** of lever **254**. When the return link **278** moves downwardly, pin **288** moves vertically downwardly as viewed in Figure 8 and first cams the lower end of link **292** to the right. Further movement of pin **288** downwardly pivots lever **254** in a counterclockwise direction about its pivot **258** to tilt bottom plate **232** about its right-hand edge as viewed in Figures 3 and 8 to permit money contained in bucket **230** to fall out of the bottom of the bucket and be directed by baffle **244** to the coin return chute **245** of the machine. Screws **300** mount a stop bracket **298** on plate **12** below the lower end of link **292** as viewed in Figure 8. This bracket **298** prevents a dishonest customer from jarring the machine to pivot lever **254** to return his coins after they have been deposited to release bar **142**. In other words, this bracket prevents return of coins in bucket **230** before actuation of the dispensing mechanism which is permitted by freed bar **142**. Link **278** carries a second pin **302** which moves downwardly with the link to engage a second cam surface **304** on lever **262** to pivot the lever in a counterclockwise direction about pin **260** as viewed in Figure 2 when the coin return mechanism is actuated. This action resets register bar **126** upon operation of the coin return mechanism of the machine.

The coin totalizer lock bar **142** and coin return link **278** carry respective locking blocks **306** and **308** for cooperation with each other to prevent concomitant operation of both the dispensing mechanism and the coin return mechanism of the totalizer. As can be seen by reference to Figure 2, block **306** moves under block **308** when bar **142** moves to the right to prevent operation of the coin return link **278** when a dispensing operation is performed. Similarly block **308** moves in front of block **306** when a coin return operation is initiated to prevent operation of the dispensing mechanism.

In operation, when a customer wishes to purchase an article of merchandise contained in a machine including my mechanical coin totalizer, he deposits a sum in coins aggregating the purchase price of a desired article in the coin slot **19** of the totalizer. Coins deposited in slot **19** pass downwardly through the coin separator and slug ejector which separates slugs and spurious coins from true coins and which classifies coins according to their denomination in any convenient manner known to the art. The coin separator and slug ejector **16** direct respective quarters, dimes, and nickels into coin passages **34**, **26**, and **36** of my totalizer. A quarter passing downwardly through passage **34** engages projection **116** on feeler arm **114** to pivot latch **82** in a clockwise direction about pin **80** as viewed in Figure 3. This movement of latch member **82** moves arm **92** out of engagement with an escapement tooth **70** on rack **48** to permit floating pinion **136** to move downwardly a predetermined distance corresponding to the distance between adjacent escapement teeth **70** on rack **48**. After the quarter passes projection **116**, spring **88** returns latch **82** and arm **114** to their initial positions to engage latch arm **92** with the next escapement tooth **70** on rack **48**.

A nickel passing downwardly through passage **36** is directed to engage projection **104** on arm **100** to rotate bell crank **94** to pivot latch **76** in a counterclockwise direction as viewed in Figure 3 to move arm **90** out of engagement with an escapement tooth **68** on rack **46**. Projection **109** on latch **76** engages an escapement tooth **68** to limit the downward movement of rack **46**. After a nickel has passed projection **104**, spring **84** returns latch **76** to its initial position and engages arm **90** with the next succeeding escapement tooth **68** on rack **46** to the one it previously engaged.

A dime passing downwardly through passage **26** first engages projection **104** on arm **100** to step rack **46** downwardly in the same manner as would a nickel. After having left projection **104**, the dime engages projection **108** on arm **102** again to step rack **46** through the distance of one escapement tooth. As has been explained hereinabove, each stepping of rack **46** or **48** permits a predetermined downward movement of the floating pinion **136**.

As pinion **136** moves downwardly, rod **128** moves downwardly to permit a corresponding predetermined downward movement of register bar **126** proportional to the value of the coin causing the movement. If the correct sum in coins corresponding to the purchase price for which stop **152** has been set are deposited in slot **19** and if the pin **198** corresponding to the selected article of merchandise is set to provide no price differential, stop **152** engages pawl **144** to move it out of the path of projection **150** to free bar **142** to permit operation of the dispensing mechanism.

After the correct amount in coins to actuate pawl **144** has been deposited in the machine, the customer may operate a pull bar **184** corresponding to the selected brand and kind of merchandise to perform a dispensing operation. As has been explained hereinabove, if pin **198** is positioned in a hole **192** or **196** of the group of holes corresponding to a desired kind and brand of merchandise, additional coins must be inserted in the machine before register bar **126** moves stop pawl out of the path of projection **150** when the pull bar **184** is operated. For example, if stop **152** is set at a twenty-five-cent price level on bar **126** and pin **198** is in hole **194**,

operation of the associated pull bar **184** will not move cam **164** and merchandise of the kind and brand corresponding to the operated pull bar **184** is dispensed upon deposit of twenty-five cents in coins in the machine. If, with the arrangement shown, the pin **198** corresponding to a particular brand contained in the machine is in hole **196**, thirty cents in coins must be deposited in the machine before operation of the corresponding pull bar **184** will result in a dispensing operation. This follows from the fact that operation of the pull bar **184** moves level **176** into engagement with the pin **162** to position pawl **144** so that it will not be released until bar **126** moves downwardly through a distance corresponding to a thirty-cent deposit in the machine. If the pin **198** corresponding to a type and brand is in hole **192**, thirty-five cents must be deposited in the machine before a dispensing operation can be performed by actuation of the associated bar **184**. Other price differentials are provided for adjusting the position of cam **164** on crank **168** by locating holes **172**.

In order to perform a dispensing operation after he has deposited a sum in coins aggregating the purchase price of the article desired in the machine, the customer moves one of the pull bars **184** to the right as viewed in Figure 10. This actuates the dispensing mechanism (not shown) of the machine which moves bar **142** to the right as viewed in Figure 2 to pivot arm **216** in a clockwise direction. As arm **216** pivots, roller **226** engages the cam surface **256** of lever **254** to pivot the bottom plate **232** of escrow bucket **230** about its left-hand edge as viewed in Figures 3 and 8 to permit the accepted money to fall into a suitable coin receptacle **310** supported by the machine. At the same time roller **264** on arm **216** engages cam surface **266** to pivot lever **262** in a counterclockwise direction about pivot **260** as viewed in Figure 2 to return rod **128** and register bar **126** to their initial positions by the action of spring arm **270**. As has been explained hereinabove, when bar **142** moves to the right lock block **306** carried by the bar cooperates with block **308** to prevent operation of the coin return mechanism.

If a customer wishes the return of his money before he performs a dispensing operation, as when the supply of merchandise he desires is exhausted, he actuates the coin return mechanism to move link **278** downwardly as viewed in Figure 2. As link **278** moves downwardly, pin **288** cams the lower end of link **292** to the right as viewed in Figure 8 and moves the link downwardly to actuate lever **254** to tilt bottom plate **232** about its right-hand edge as viewed in Figures 3 and 8 to permit coins to fall out of the bucket and be guided into the coin return chute by baffie **244**. At the same time, cam roller or pin **302** engages cam surface **304** on lever **262** to pivot the lever to return the rod **128** and register bar **126** to their initial positions. The machine is then ready for a succeeding operation. When link **278** moves downwardly, block **308** carried by the link moves in front of block **306** to prevent concomitant operation of the dispensing mechanism of the machine. As has been explained hereinabove, stop bracket **298** prevents return of coins by jarring the machine after the coins have actuated pawl **144**.

It will be seen that I have accomplished the objects of my invention. I have provided an extremely flexible mechanical coin totalizer for use with merchandising machines which dispenses a large number of different kinds and brands of merchandise such as, for example, cigarettes selling at various prices. My totalizer is sensitive to all coins and permits only a single step of its mechanism agreeable to each coin deposited in the machine in accordance with its respective value. It registers all coins deposited in the machine without regard to the speed with which the coins are inserted in succession in the machine. It is certain in operation. Its operation is completely mechanical and requires no external source of electrical power.

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

Having thus described the invention, what is claimed is:

1. A mechanical coin totalizer for freeing a normally locked operating element including in combination means for releasing said normally locked operating element, means comprising a member mounted for movement to actuate said release means, a pinion, means rotatably mounting said pinion on said member, a first toothed means for driving said pinion, first escapement teeth having a predetermined intertooth spacing on said first toothed means, a second toothed means for driving said pinion, second escapement teeth on said second toothed means, said second escapement teeth having an intertooth spacing which is greater than said intertooth spacing of said first escapement teeth, releasable means cooperating with said first and second escapement teeth for normally restraining said toothed means against movement and means for releasing said releasable means to permit said first and second toothed means to drive said pinion to move said member through respective first and second predetermined distances in response to the deposit in the totalizer of coins of different respective denominations.

2. A mechanical coin totalizer for freeing a normally locked operating element including in combination means for releasing said normally locked element, means comprising a movable member for actuating said release means, a pinion, means rotatably mounting said pinion on said member, a first rack for driving said pinion, first escapement teeth having a predetermined intertooth spacing on said first rack, a second rack for driving said pinion, second escapement teeth on said second rack, said second escapement teeth having an intertooth spacing which is greater than the intertooth spacing of said first escapement teeth, a first escapement latch cooperating with said first escapement teeth for normally restraining said first rack against movement, means responsive to the deposit in the totalizer of a coin of a first denomination for actuating said first escapement latch to permit said first rack to drive said pinion to move said member through a first predetermined distance, a second escapement latch cooperating with said second escapement teeth for normally restraining said second rack against movement and means responsive to the deposit in said totalizer of a coin of a second denomination for actuating said second escapement latch to permit said second rack to drive said pinion to move said member through a second predetermined distance which is greater than said first predetermined distance.

3. A mechanical coin totalizer for freeing a normally locked operating element including in combination means for releasing said normally locked operating element, means comprising a movable member for actuating said release means, a pinion, means rotatably mounting said pinion on said member, a first rack for driving said pinion, first escapement teeth having a predetermined intertooth spacing carried by said first rack, a second rack for driving said pinion, second escapement teeth carried by said second rack, said second escapement teeth having an intertooth spacing which is greater than the intertooth spacing of said first escapement teeth, first releasable means for cooperating with said first escapement teeth for normally restraining said first rack against movement, first means responsive to the deposit in said totalizer of a coin of a first denomination for actuating said first releasable means to permit said first rack to drive said

pinion to move said member through a first predetermined distance, second releasable means for cooperating with said second escapement teeth for normally restraining said second rack against movement, second means responsive to the deposit in the totalizer of a coin of a second denomination for actuating said second releasable means to permit the second rack to drive the pinion to move said member through a second predetermined distance which is greater than said first predetermined distance and means including said first actuating means responsive to the deposit in the totalizer of a coin of a third denomination for actuating said first releasable means to permit said first rack to drive said pinion to move said member through a third predetermined distance which is greater than said first predetermined distance and less than said second predetermined distance.

4. A mechanical coin totalizer as in claim 2 in which said means for releasing the normally locked operating element is a pivoted stop latch, said release means actuating means including a register bar adapted to move under the influence of gravity to pivot the stop latch to release the normally locked operating element, said member normally preventing movement of said register bar.

5. A mechanical totalizer as in claim 2 in which the means for releasing the normally locked operating element is a pivoted stop pawl, said release means actuating means including a register bar movable under the influence of gravity and adjustable means carried by said register bar for pivoting said pawl when said register bar moves under the influence of gravity.

6. A mechanical coin totalizer as in claim 2 including means for resetting said racks and said pinion.

7. A mechanical coin totalizer as in claim 2 including means for resetting said racks and said pinion and a merchandising machine operating member for actuating said resetting means.

8. A mechanical coin totalizer as in claim 2 including means for resetting said racks and said pinion and a merchandising machine coin return member for actuating said resetting means.

9. A coin totalizer for freeing a normally locked operating element including in combination locking means for locking said operating element, means for releasing the locking means, means responsive to the deposit of coins in the totalizer for actuating said release means, mounting means normally positioning said locking means to be acted upon by said release means upon the deposit in the totalizer of a predetermined sum in coins, means for moving said positioning means to position said locking means to be acted upon by said released means upon the deposit in the totalizer of a sum in coins other than said predetermined sum and means for actuating said positioning means moving means.

10. A coin totalizer as in Claim 9 in which the means for moving the positioning means is a multiple level price setting cam.

11. A coin totalizer for freeing a normally locked operating element including in combination a latch for releasing the normally locked operating element, a movable member, means pivotally mounting said latch on said member, means responsive to the deposit of coins in said totalizer for actuating said latch, a price setting cam formed with a plurality of different levels, means normally urging said member into engagement with a level of said cam to position said latch to be acted upon by said actuating means upon the deposit in the totalizer of a predetermined sum in coins, and means for moving said cam to move said member to position said latch to be acted upon by said actuating means upon the deposit in the totalizer of a sum in coins other than said predetermined sum.

12. A coin totalizer as in claim 11 in which the means for moving said cam includes a merchandising machine selecting bar.

13. A coin totalizer as in claim 11 in which said means for moving said cam includes a merchandising machine selecting bar, and means responsive to the movement of said selecting bar for selectively providing a plurality of predetermined amplitudes of movement of said cam.

14. A coin totalizer as in claim 11 in which the price levels of said cam are arranged in a plurality of groups of three price levels and means for adjusting the initial position of said cam to provide price settings corresponding to one of said groups.

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