March 4, 1958 C. GABRIELSEN 2,825,346

CHANGE DISPENSING MECHANISM FOR MERCHANDISING MACHINES

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Fig 1

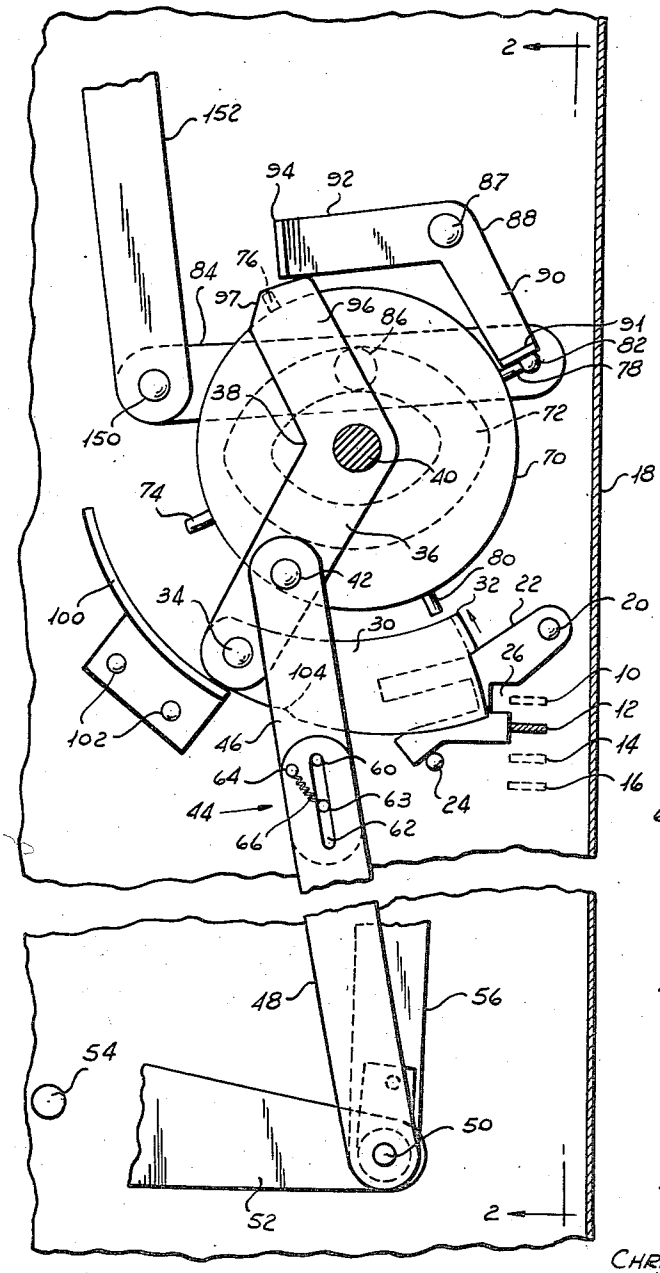

Fig 2

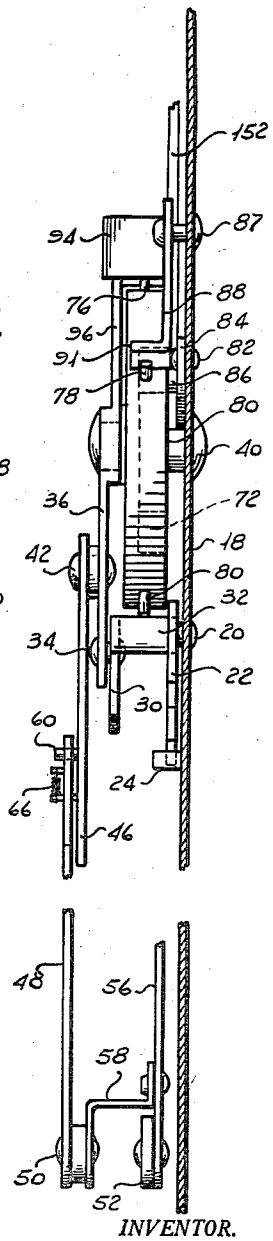

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Fig 3

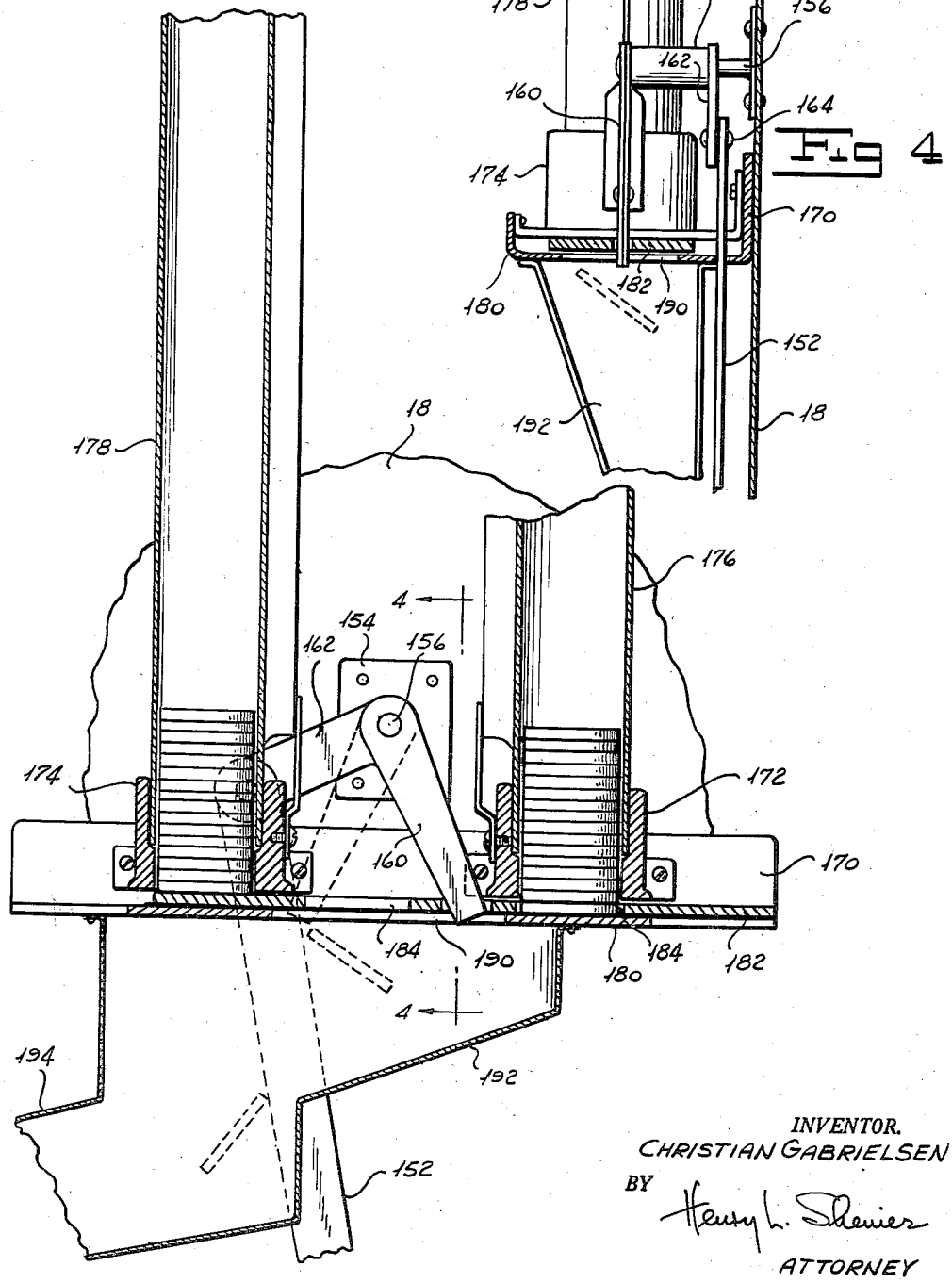

Fig 4

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CHANGE DISPENSING MECHANISM FOR MERCHANDISING MACHINES

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Application June 7, 1952, Serial No. 292,292

10 Claims. (Cl. 133—2)

My invention relates to a change dispensing mechanism for merchandising machines and more particularly to an improved change dispensing mechanism of increased capacity and simplicity in construction and dependability in operation.

In my copending application Serial No. 768,997, filed August 16, 1947, for coin register assembly for coin controlled vending machines, now Patent No. 2,704,590, I have shown a coin register having a plurality of slides adapted to be selectively freed by a plurality of coins aggregating a predetermined amount and have shown a system for giving change.

The instant invention is a simplified construction for giving change of one nickel when operating a merchandising machine with a quarter deposit for a 20¢ purchase.

Most brands of cigarettes today are sold for either twenty cents or twenty-five cents in merchandising machines and it has been found that the majority of sales are made for a quarter. In my copending application means are provided for replenishing a reservoir with nickels. Where the majority of sales are made for a quarter the nickel supply is not replenished and it is found desirable in many locations to provide a supply of nickels for change in coin tubes. If we place a quantity of nickels equal to the 20¢ merchandise in the machine we will be sure that the machine will operate to dispense all of the 20¢ merchandise.

One object of my invention is to provide a change dispensing mechanism of increased capacity for merchandising machines.

Another object of my invention is to provide a change dispensing mechanism adapted selectively to give change in response to a sensing mechanism associated with a coin register.

Another object of my invention is to provide a change dispensing mechanism which is certain in operation and inexpensive in construction.

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

For purposes of convenience I will describe my change maker in connection with a merchandising machine set to dispense merchandise for twenty cents with a coin register of the type shown in my copending application. In this there are four slides, one adapted to be freed for four nickels, one adapted to be freed for a dime and two nickels, one adapted to be freed for two dimes, and one adapted to be freed for a quarter. Whenever one of the slides of the coin register is freed the merchandising machine will operate. The merchandising machine may be of any suitable type such as shown in my Patent No. 2,546,690, dated March 27, 1951. In this patent, whenever one of the coin register slides is freed, an electric motor will operate to rotate a cam to oscillate a bell crank. The oscillation of the bell crank operates an operating bar and a match dispensing mechanism.

In general, my invention contemplates driving my change dispensing mechanism from this bell crank,

though it is to be uderstood that any moving part associated with the vending mechanism of a vending machine may be readily employed to furnish the power for my change dispensing mechanism. The arrangement is such that the operating mechanism will operate each time. A coupling device is provided adapted to couple the operating mechanism with the change dispensing mechanism. Normally, the coupling device is uncoupled and no change is given. When, however, change is called for by the operation of the quarter slide, the coupling mechanism is operated and change is dispensed. In order to provide increased capacity, two coin tubes are provided which are set into use alternately. This avoids too high a column of nickels and prevents the creation of large forces requiring heavy parts.

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 a portion of my change dispensing mechanism showing one embodiment of my invention.

Figure 2 is a side elevation of the change dispensing mechanism shown in Figure 1 viewed along the line 2—2 of Figure 1.

Figure 3 is a fragmentary view showing another portion of the change dispensing mechanism.

Figure 4 is a fragmentary sectional view taken along the line 4—4 of Figure 3.

Referring now to Figure 1, there is shown in dotted lines the position of the coin slides of a coin register such as is shown in my copending application above referred to. The slide **10** operates in the example given for four nickels. The slide **12** operates for a quarter. The slide **14** operates for two nickels and a dime, and the slide **16** operates for a dime. When the slides operate they move from right to left as viewed in Figure 1. It is to be understood that any suitable mechanism for sensing when change is to be given known to the art may be employed. All that is necessary is that an element move from right to left in response to a demand for change. The frame **18** of a merchandising machine of any appropriate construction carries a pivot pin **20** on which is mounted a pivoted pawl **22** freely rotatable about the pin **20**. A stationary stop pin **24** is mounted on the frame **18** and limits the downward movement under the influence of gravity of the pawl **22**. It will be seen that the slides **14** and **16** clear the pawl so that their movement to the left will not affect it. Similarly, the upper slide **10** is adapted to move into a notch **26** clear of the pawl proper. The slide **12**, however, is adapted to contact the pawl **22** so that when it moves to the left the pawl will rotate in a clockwise direction. A second pawl **30** is provided with a flange **32** adapted to contact the upper surface of the first pawl **22**. The second pawl **30** is pivotally mounted on a pin **34** carried by the crank arm **36** of a bell crank **38** which is pivotally mounted about a shaft **40** carried by the frame **18**. The arm **36** of the bell crank is pivotally connected by pin **42** to an operating link indicated generally by the reference numeral **44**. This link is formed with an upper portion **46** and a lower section **48**. The lower section is pivotally connected through pin **50** to the end **52** of the operating bell crank of the merchandising machine. This bell crank is adapted to pivot about an axis shaft **54** such that the end **52** will move upwardly and then return during each operation of the merchandising machine. The connection may be advantageously made through the link **56** which operates a match delivery mechanism, such as is shown in my Patent No. 2,546,690 above referred to, by means of a connecting bracket **58**. The end **52** of the bell crank operates the match dispens-

ing operating link 56. The motion is transmitted through the bracket 58 and the pin 50. Thus it will be seen that the lower member of the change mechanism operating link 44 is moved upwardly and downwardly with each operation of the vending machine, as will be readily understood by those skilled in the art. The upper member 46 of the change mechanism operating link carries a pin 60 which is secured thereto and lodged in a slot 62. A second pin 63 is likewise carried by the upper section 46 of the change mechanism operating link 44 and positioned in the slot. The two pins 60 and 63 serve to maintain the upper and lower sections 46 and 48 of the link 44 in alignment. A pin 64 is secured to the lower section 48 of the link. A spring 66 joins pins 64 and 63 and is normally under tension. The spring urges the upper section 46 upwardly with respect to the lower section 48. This upward motion is limited by the pin 60 engaging the upper portion of the slot 62. It will be readily appreciated, furthermore, that if we immobilize the bell crank 38, the motion of the operating member of the merchandising machine will simply move the lower section 48 of the link 44 with respect to the upper section 46, stretching the spring 66. This construction enables me to avoid close fitting of the change dispensing operating cam, as will be pointed out more fully hereinafter.

Rotatably mounted on the shaft 40 I provide a cam 70 provided with a cam groove 72. The cam carries radially extending pins 74, 76, 78 and 80 which are placed 90° apart. The frame carries a pin 82 on which is pivotally mounted a lever 84. Intermediate the ends of this lever and carried thereby I provide a cam follower 86 which is positioned in the cam track 72. When the cam rotates 90° from the position shown in Figure 1 the left-hand end of the lever 84 will move upwardly. During the next 90° rotation it will move downwardly. The arrangement of parts is such that each operation of the machine will move the cam 70 90°. A stationary pin 87 is carried by the frame 18. Pivotally mounted on the pin 87 I provide a bent pawl or cam positioner 88. The lower arm 90 of this pawl is provided with a flange 91 adapted to contact the pin 78 in the position shown in Figure 1. The other arm 92 of the pawl is provided with a flange 94 adapted to contact the upper edge of the arm 96 of the bell crank 38. Flange 94 controls the cam positioner 88 and is operated by the upper edge 97 of arm 96. In the position shown in Figure 1 the upward motion of the left-hand arm 92 of the cam positioner 88 brings the flange 91 into contact with the radial pin 78 of the cam and prevents the cam from rotating in a counterclockwise direction. When the operating link 44 moves upwardly the bell crank 38 will be rotated in a clockwise direction. This will carry the pawl 30 to the left. A guide member 100 is secured to the frame by means of pins 102. The lower edge of the pawl 30 is provided with a step 104. As soon as this step is carried into contact with the guide member 100 the flange 32 of the pawl 30 is brought substantially into contact with the edge of the cam 70. This movement, however, does not normally occur until after the pawl has moved to the position of the step 104, that is, past the pin 80. Accordingly, the pawl 30 will simply ride around the guide member 100 with the flange 32 contacting the edge of the cam 70. The clockwise motion of the bell crank 38 also carries the upper edge of the arm 96 free of the flange 94 of the bent pawl 88. Since the arm 92 is longer and heavier than the arm 90, the bent pawl 88 will rotate in a counterclockwise direction as soon as this occurs. The arrangement of parts is such that this action will take place before the cam surface 104 engages the guide 100. The flange 94, therefore, will be permitted to drop behind the pin 76. This precludes any friction between the flange 32 and the edge of the cam 70 from rotating the cam in a clockwise direction. When, however, change is called for by the coin register of the merchandising machine the slide 12 will move to the left in its motion concomitantly with setting the merchandising machine into operation. The leftward motion of the slide 12 rotates the pawl 22 in a clockwise direction and thus rotates the second pawl 30 in a counterclockwise direction. This brings the flange 32 behind the radial pin 80. When the pawl 30 moves to the left under the influence of the operating link 44 and the connection of this pawl with the bell crank 38, it will rotate the cam 70 in a clockwise direction. Bell crank 38 and pawl 30 form a coupler for coupling the drive member 52 to the cam 70 to rotate the cam when flange 32 has been engaged wtih one of the pins 74 to 80. The flange 91 does not prevent this rotation. Flange 94, is during the initial part of the movement, held clear of the pin 76. As soon as the upper arm 96 of the bell crank 38 is moved clear of the flange 94 it will drop to the edge of the cam 70 but behind the pin 76 which has in the meantime moved to the right. Before the flange 32 leaves the pawl 22 the inclined step 104 at the lower surface of the pawl 30 will have engaged the guide 100, thus maintaining the flange 32 in a position behind the radial pin 80 in order that continued rotation of the bell crank 38 will continue to rotate the cam 70. Step 104 is, therefore, a follower carried by the coupler formed by bell crank 38 and pawl 30 and cooperates with the stationary cam 100 to maintain the engagement of flange 32 with one of the pins 74 to 80. Shortly after the merchandising machine is set into operation the coins will be accepted and the member 12 will return to the right letting the pawl 22 drop to its original position. As the rotation of the cam 70 in a clockwise direction continues, the pin 74 will contact the flange 94 so that further motion of the cam cannot take place in a clockwise direction. If the adjustment of parts is such that after the flange 94 engages the radial pin 74 the link 44 continues to move upwardly, all that occurs is that the spring 66 will stretch, preventing any part from being subjected to undue stress and possibly becoming bent or broken. It will be seen that the resilient construction of the operating link 44 allows me to avoid a critical adjustment or construction of the connection between the operating part of the merchandising machine which furnishes power for the operation of the coin dispensing mechanism. At the same time the cam 70 is positioned accurately each time. Upon the return or downward motion of the operating link 44 the bell crank 38 will rotate in a counterclockwise direction. The cam surface 97 formed at the upper portion of the upper arm 96 will engage the flange 94 and cam the bent pawl 88 to rotate in a clockwise direction to the position shown in Figure 1 ready for the next cycle. It will be seen that the pawl 30 operates each time the vending machine is operated. It is, however, normally uncoupled from the cam 70 which operates the change dispensing mechanism directly. Whenever change is called for this pawl 30 is coupled and the cam 70 operated.

The left-hand end of lever 84 carries a pin 150 to which a link 152 is pivotally connected. Successive operations of the vending machine will move the pin and hence the link 152 alternately first upwardly and then downwardly.

Referring now to Figure 3, the frame 18 carries a bracket 154 which carries a shaft 156. Around the shaft 156 I mount a sleeve 158 for rotation with respect to the shaft. To one end of the sleeve is secured a crank 160. To the other end of the sleeve 158 I secure a rocker crank 162. The end of this rocker crank is connected by a pin 164 to the upper end of the link 152. As viewed in Figure 3, when the link 152 moves upwardly the crank 160 will rotate around the shaft 156 in a clockwise direction. When the link 152 moves downwardly the crank 160 will rotate around the shaft 156 in a counterclockwise direction. A shelf 170 is carried by the frame 18 in any suitable manner. Supported by the shelf I provide a pair of coin tube sockets 172 and 174 in which I

position a pair of respective coin tubes **176** and **178** adapted to hold the coins given in change, as for example, nickels. In practice I have found that each of the coin tubes may be made twelve inches long and thus hold one hundred and sixty nickels. This gives ample capacity for large merchandising machines. It will be observed that the coin tube sockets **172** and **174** have their lower edges spaced from the flange **180** of the shelf **170** through a distance slightly in excess of the thickness of a nickel. A coin dispensing slide **182** is mounted on top of the flange **180** between its upper surface and the coin tube sockets **172** and **174**. The slide is formed with a pair of openings **184** which are circular and when in position underneath the coin tubes form an extension of the coin tube socket so that the nickels in the coin tubes may pass into position resting upon the flange **180** and embraced by the circular opening **184**. It will be seen that the slide **182** must be accurately positioned. This is the reason why I employ the positioning means comprising the bent pawl **88**. This ensures that the slide will always be positioned alternately with the left-hand opening **184** in alignment with the coin tube **178** or with the right-hand opening **184** in alignment with the coin tube **176**, as shown in Figure 3.

The position of parts shown in Figure 3 is such that a nickel has just been dispensed through the opening **190** formed in the flange **180** from the left-hand coin tube. This dispensing operation was occasioned by the link **152** moving downwardly and the rotation of the crank **160** in a counterclockwise direction to move the slide **182** to the right. A hopper **192** leading to a coin chute **194** returns the nickel to the purchaser through a coin return opening (not shown) formed in the merchandising machine as is well understood by those skilled in the art. Upon the next operation of the coin dispensing mechanism in which change is called for the link **152** will move upwardly under the influence of the lever **84**, the cam follower **86** and the cam **70** which is rotated as hereinbefore described. In Figure 3 it will be observed that the bottom nickel of the coin tube **176** is now resting in the right-hand opening **184**. When the slide moves to the left it will carry the nickel over the opening **190** and permit it to fall by gravity into the hopper **192** and thence to the coin return chute **194**. At the same time the left-hand opening **184** will be moved into position to permit the bottommost nickel from the left-hand coin tube **178** to fall into position for the next change dispensing operation.

It will be seen that my construction has many advantages. I have provided a large coin capacity for change in a minimum amount of space and have avoided excessively long coin tubes by using a pair of coin tubes from which change is alternately removed. I have provided a simple means for accurately positioning the coin dispensing slide upon each operation. I have employed the motive power in connection with the merchandising machine with which my change dispensing mechanism is associated for operating the coin dispensing mechanism. The pawls **30** and **22** may be made of light metal so that a very slight force is required to couple the pawl **30** with the cam **70**. In spite of the necessity for accurately positioning the coin dispensing slide the connections from the prime mover are such that they need not be too accurately constructed and a wide latitude in this connection may be permitted without disturbing the accuracy of the positioning of the coin slide **182**. Due to the fact that the coin slide is driven from the same force which operates the merchandising machine itself, the slide **182** will be driven against the increased force occasioned by the friction due to the weight of a column of nickels a foot long in each of the coin tubes.

It will be understood, of course, that any movable part associated with any of the coin registers of the prior art calling for change may be employed to rotate the pawl **22**. It will be also understood that by making the slide **182** wide enough to accommodate the thickness of two nickels, ten cents in change can be given. It will likewise be understood that while I have described the operation of my coin dispensing mechanism in the giving of one nickel change for a quarter deposit for a 20¢ purchase, my change maker can be used in candy machines to give a nickel change upon the deposit of a dime for a 5¢ purchase.

It will be seen that I have accomplished the objects of my invention. I have provided a change dispensing mechanism of increased capacity adapted to be used on merchandising machines of every description. I have provided a change dispensing mechanism adapted simultaneously to give change in response to the sensing mechanism associated with a coin register.

My improved change dispensing mechanism is certain in operation and inexpensive in construction. The parts associating my change dispensing mechanism with the prime mover of the merchandising machine proper need not be accurately adjusted or constructed. Owing to my improved construction the coin slide of the change dispensing mechanism will be accurately positioned even though accuracy is not required in coupling my change dispenser to the prime mover.

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 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, what I claim is:

1. In a change dispenser, a driven reciprocating part, a rotatably mounted cam, a coupler, a link connecting the reciprocating part and the coupler, normally disengaged engageable means carried by the coupler and the cam, a coupler actuator for engaging the normally disengaged means to rotate said cam as said reciprocating part is driven, a change-sensing means for operating the actuator, a change coin holder, a coin dispenser for dispensing coins from the holder, a cam follower controlled by the cam and means connecting the follower and the dispenser for moving the dispenser to dispense coins as change.

2. A change dispenser as in claim 1 including a cam positioner, stationary means adjacent the cam for mounting the positioner, interengageable means carried by the positioner and the cam adapted to angularly position the cam in its rotary movement, a cam positioner controller and means carried by the coupler for working the controller.

3. A change dispenser as in claim 1 including a stationary cam member, means for mounting the stationary cam member adjacent the coupler, a coupler follower carried by the coupler normally out of engagement with the stationary cam and means for bringing the coupler follower into contact with the stationary cam after a predetermined movement of the coupler whereby to maintain the normally disengaged engageable means in engaged relation after the coupler actuator has operated.

4. A change dispenser as in claim 1 in which said link comprises a pair of members relatively movable with respect to one another longitudinally thereof, biasing means for urging the members to form a link of lengthened dimensions, stop means for limiting the action of the biasing means, the construction being such such that if the link encounters resistance, said biasing means will yield.

5. A change dispenser as in claim 1 in which the coupler comprises a crank mounted for oscillation coaxially with the axis of rotation of the cam and a pawl pivotally carried by the crank, said pawl being actuated by said coupler actuator to engage said normally disengaged means.

6. A change dispenser as in claim 1 in which the coupler comprises a crank mounted for oscillation coaxially with the axis of rotation of the cam, a pawl pivotally carried by the crank and said engageable means includes a plurality of radial extensions carried by the cam and a flange carried by the pawl, said pawl being actuated by said coupler actuator to engage said normally disengaged means.

7. A change dispenser as in claim 1 in which said coupler includes a first pawl and said actuator comprises a second pawl, means for pivoting said second pawl adjacent the first pawl, stop means for limiting the movement of the second pawl and interengageable means carried by the first and second pawls.

8. A change dispenser as in claim 1 in which said change coin holder comprises a pair of coin tubes and the coin dispenser includes a slide formed with a pair of openings adapted alternately to receive coins from the coin tubes.

9. A change dispenser as in claim 1 in which the cam follower comprises a lever, means for pivoting the lever to a stationary point adjacent one of its ends, a cam groove carried by the cam and a member carried by the lever lodged in the cam groove.

10. A change dispenser as in claim 1 in which the means connecting the follower and the dispenser comprises a rocker shaft, a crank connected to the rocker shaft for rotation therewith, a link connecting the follower and the crank, an operating crank carried by the rocker shaft and means connecting the operating crank and the dispenser.

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