July 19, 1932. E. SANDBERG 1,868,222

VENDING MACHINE

Filed Nov. 13, 1929 3 Sheets-Sheet 1

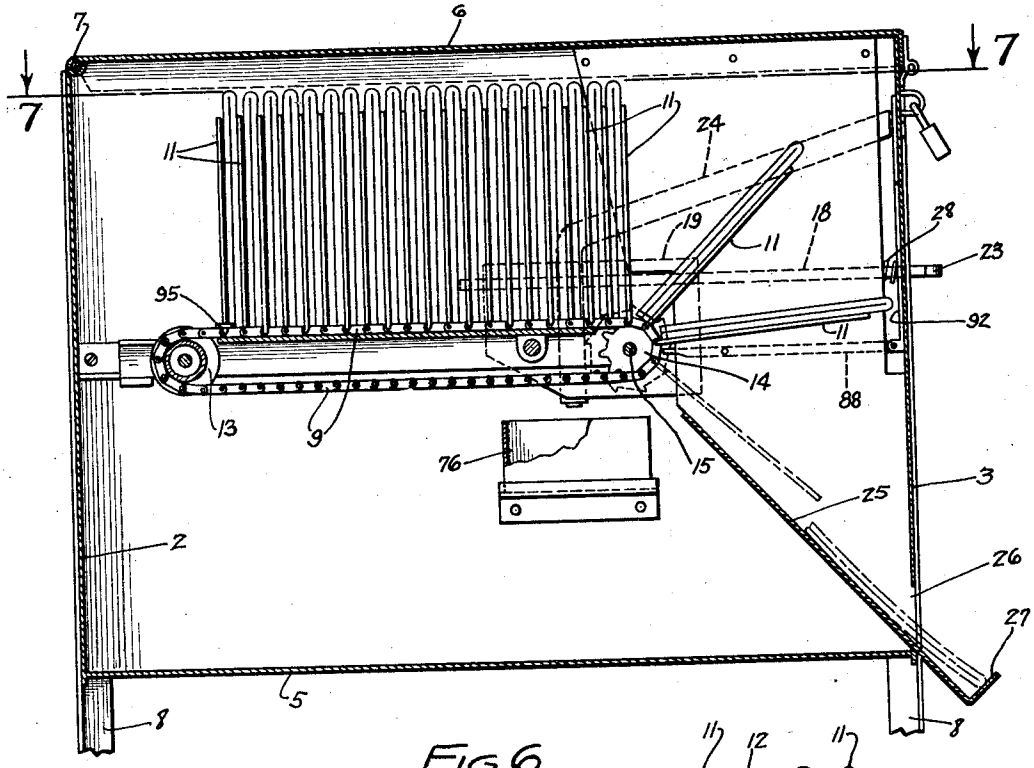


FIG. 6

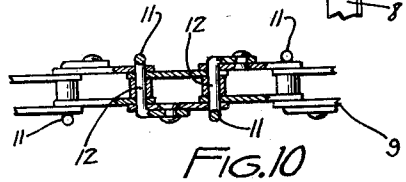


FIG. 10

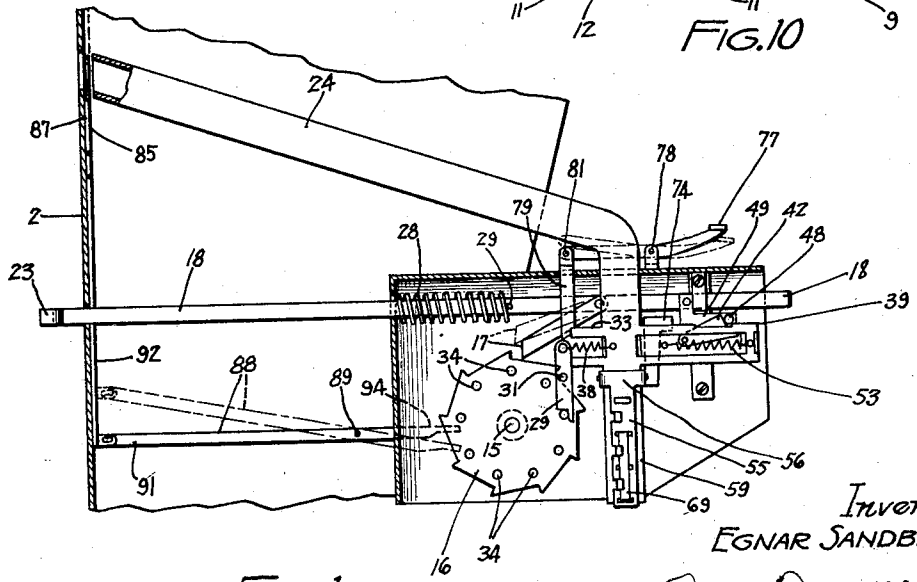


FIG. 1

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VENDING MACHINE

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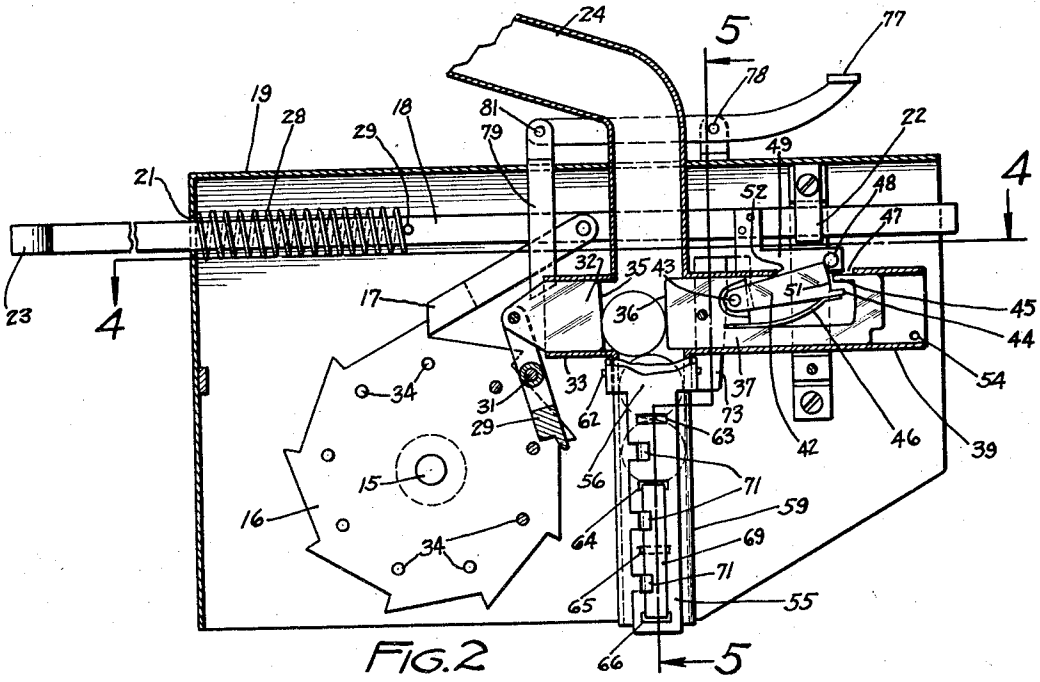


FIG. 2

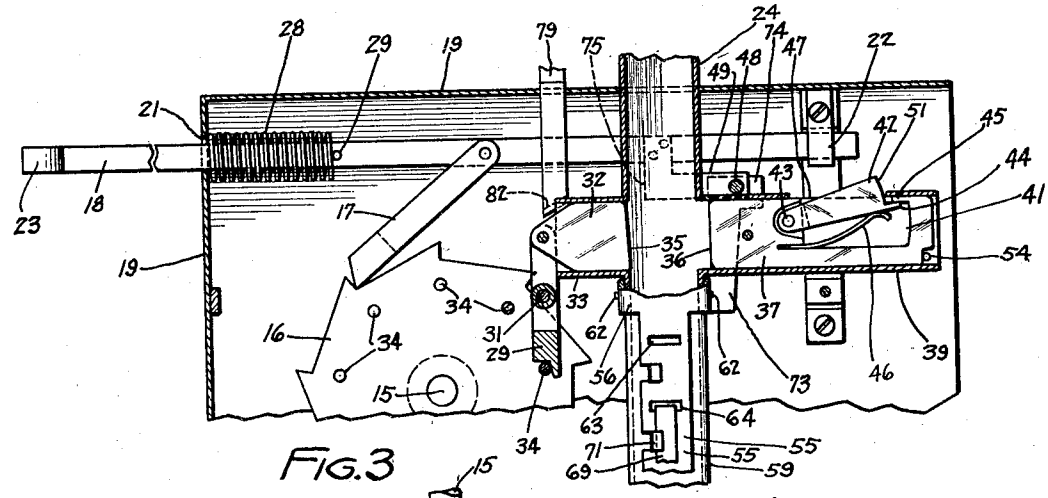


FIG. 3

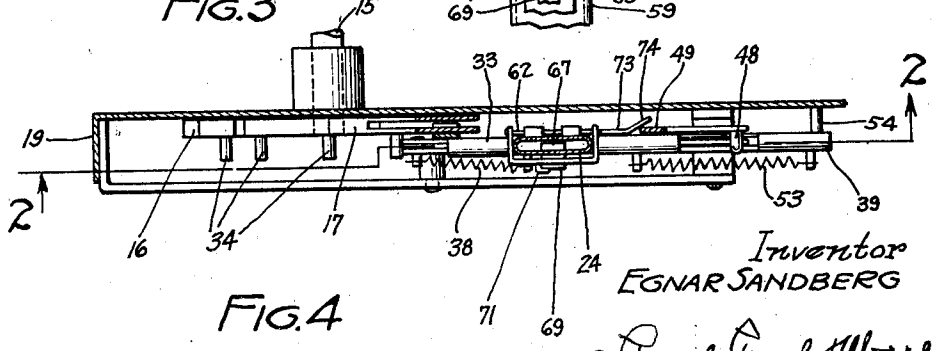


FIG. 4

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VENDING MACHINE

Filed Nov. 13, 1929 3 Sheets-Sheet 3

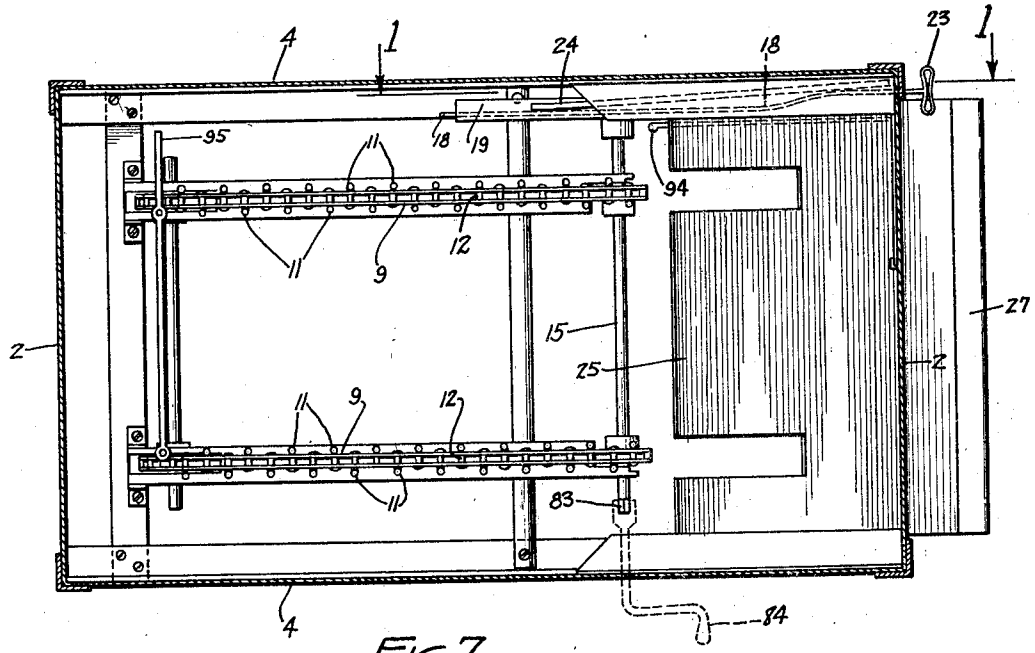


FIG. 7

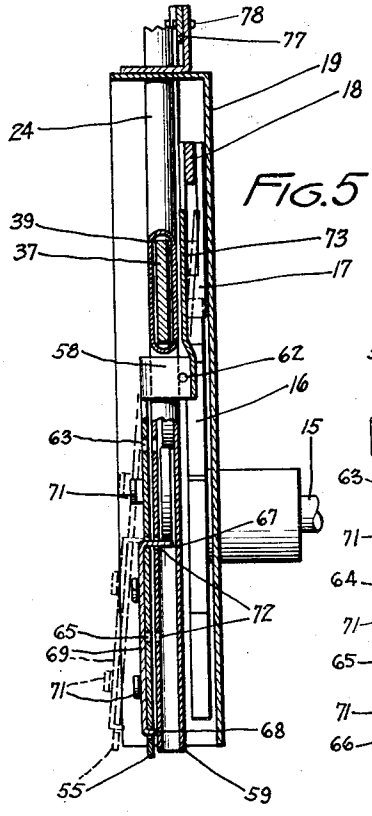


FIG. 5

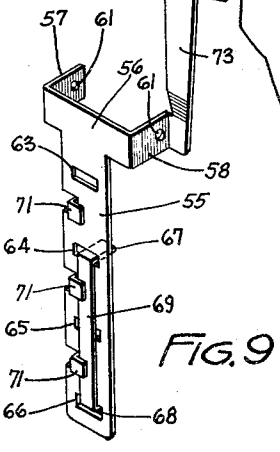


FIG. 9

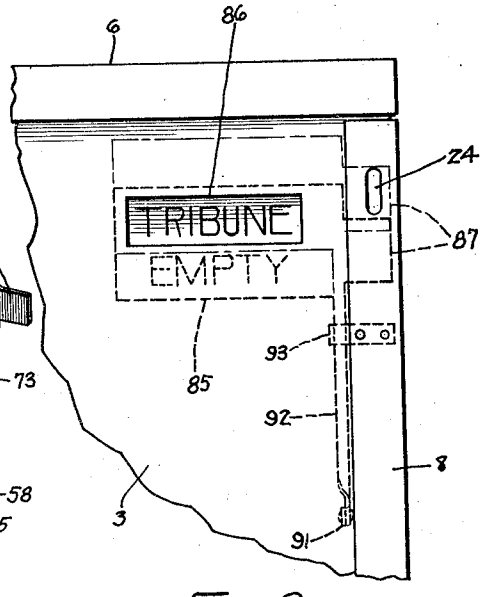


FIG. 8

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Patented July 19, 1932

1,868,222

UNITED STATES PATENT OFFICE

EGNAR SANDBERG, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-THIRD TO ALBERT G. SANDBERG AND ONE-THIRD TO MARK D. BOHEN, BOTH OF MINNEAPOLIS, MINNESOTA

VENDING MACHINE

Application filed November 13, 1929. Serial No. 406,814.

This invention relates to new and useful improvements in vending machines.

An object of the invention is to provide an improved vending machine adapted for vending such articles as newspapers, magazines, and the like, including a conveyer comprising a plurality of fingers or rods spaced apart to provide compartments adapted to receive the articles to be vended, and the operation of said conveyer being controlled by means of a coin-actuated mechanism.

A further object is to provide a coin-actuated mechanism so designed that a plurality of coins must be inserted thereinto before it can be operated to cause an article to be vended.

A further object is to provide such a coin-actuated mechanism having means whereby it may be adjusted so that a certain number of coins must be inserted thereinto before it can be operated to cause the ejection of an article.

Features of the invention reside in the general construction of the conveyer; in the means provided in connection therewith to indicate when the vending machine is empty; in the general construction of the coin-actuated mechanism; in the means provided for locking the ratchet wheel of the mechanism when the coin chute is empty; and in the means provided whereby the mechanism may be adjusted so that a certain number of coins must be inserted into the coin chute before the mechanism can be operated to discharge an article from the vending machine.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings, there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a detail sectional view on the line 1—1 of Figure 7, showing the coin-actuated mechanism in normal position;

Figure 2 is an enlarged detail sectional view on the line 2—2 of Figure 4, showing the mechanism adjusted so that three coins must be inserted thereinto before it can be operated, and also showing the mechanism partially operated to release the ratchet wheel;

Figure 3 is a view showing the mechanism after having been operated to eject an article from the vending machine;

Figure 4 is a sectional plan view on the line 4—4 of Figure 2;

Figure 5 is a vertical sectional view on the line 5—5 of Figure 2;

Figure 6 is a vertical sectional view showing a vending machine with the invention embodied therein;

Figure 7 is a sectional plan view on the line 7—7 of Figure 6;

Figure 8 is a detail view showing a portion of the exterior of the machine casing and the means provided for indicating when the machine is empty;

Figure 9 is a perspective view showing the means provided for adjusting the mechanism so that a certain number of coins must be inserted thereinto before it can be operated; and

Figure 10 is an enlarged detail view showing a manner of connecting the fingers to the chain links.

In the selected embodiment of the invention here shown, there is illustrated in Figures 6 and 7, a vending machine including a casing comprising end walls 2 and 3, side walls 4, a bottom 5, and a top wall 6 preferably hinged to the end wall 2, as indicated at 7 in Figure 6. The casing is shown supported upon suitable legs 8.

A feature of the invention resides in the means provided for supporting the articles to be vended which includes endless chains 9 having a plurality of fingers 11 provided thereon as shown in Figure 6. The fingers 11 are preferably made from a suitable wire and each has one end bent at right angles and inserted through adjacent links of the chain as shown in Figure 10, whereby the offset portion 12 thereof will provide a pivot pin for connecting together adjacent links. The offset portion 12 of each finger 11 is suitably secured to one of the links to prevent relative rotation of the portion 12 and whereby the fingers 11 will be retained in upright positions upon the upper runs of the chains 9, as shown in Figure 6. The fingers 11 cooperate to provide individual holders or compartments for the articles to be vended. The conveyer chains 9 are supported at one end by idlers 13 and at their opposite ends by sprockets 14 secured to a shaft 15 rotatably mounted in suitable bearings.

Another feature of the invention resides in the construction of the coin-actuated mechanism which controls the operation of the conveyer chains 9. This mechanism comprises a ratchet wheel 16 secured to the shaft 15 and adapted to be rotated by a dog 17 having one end pivotally connected to an operating bar 18 mounted within a housing 19 and supported in suitable slides 21 and 22, shown in Figures 2 and 3. The operating bar 18 has one end projecting through the front wall 3 of the casing and is provided with a hand grip 23 whereby a purchaser, after having deposited the necessary number of coins in the coin chute 24, may pull the bar 18 outwardly from the position shown in Figure 2 to that shown in Figure 3, thereby causing the ratchet wheel 16 to be rotated which, in turn, will actuate the conveyer chains 9 to cause an article to be discharged onto an inclined plate 25 having its lower end projecting through a slot 26 in the front wall 3 of the machine casing, as shown in Figure 6. An upstanding flange 27 is provided at the lower end of the plate 25 to temporarily support the vended article on the plate. A suitable compression spring 28 is shown coiled about the bar 18 and has one end bearing against a pin 29 secured to the bar and its opposite end against a wall of the housing 19. This spring constantly urges the bar 18 in a direction towards the right when viewed as shown in Figures 2 and 3, and normally holds the bar in the position shown in Figure 1.

The means provided for locking the coin-actuated mechanism against operation when the coin chute is empty or when an insufficient number of coins have been deposited in the chute, consists of a locking pawl 29 pivoted at 31 to a wall of the housing 19 and having one end pivotally connected to a slide 32 supported in a guide 33. The opposite end of the pawl 29 is adapted to engage pins 34 provided in one side of the ratchet wheel 16 as shown in Figures 2, 3, and 4. When the parts are in normal position, as shown in Figures 1 and 3, the edge 35 of the slide 32 cooperates with the edge 36 of a relatively longer slide 37 to provide portions of the end walls of the coin chute 24 as will be noted by reference to Figure 3. A suitable tension spring 38, shown in Figures 1 and 4, normally retains the slide 32 in the position shown in Figure 3, wherein it will be noted that the lower end of the pawl 29 is positioned in the path of the pins 34 and thus prevents rotation of the ratchet wheel 16.

The relatively longer slide 37 is supported in a guide 39 substantially alined with the guide 33 for the slide 32, and has a portion cut away as indicated at 41 in Figure 3. A latch member 42 is pivotally mounted on the slide 37 by means of a pin 43, and has a projection 44 adapted to engage a projection 45 provided at the right hand end of the slide 37 as shown in Figure 3. The projections 44 and 45 cooperate to limit upward movement of the latch member 42 which is constantly urged upwardly by the action of a suitable spring 46 having one end secured to the slide 37.

The swinging end of the latch member 42 is adapted to project through a slot or opening 47 provided in the upper portion of the guide 39, as shown in Figures 1, 2, and 3. A pin 48 is mounted in a bracket 49 secured to the operating bar 18 and is adapted to engage the end 51 of the latch member 42 and move the slide 37 in a direction towards the coin chute when the operating bar 18 is pulled outwardly. When the bar 18 is thus pulled outwardly, the upper edge of the latch member 42 will engage the end 52 of the slot 47 which will cause the latch member to be moved downwardly against the action of the spring 46, causing its end portion 51 to be moved out of engagement with the pin 48. A suitable tension spring 53 constantly urges the slide 37 in a direction away from the coin chute so that when the pin 48 becomes disengaged from the end 51 of the latch member 42, the slide 37 will be returned to its normal position against a stop 54 by the action of the spring 53. When the operating bar 18 is in its normal position as shown in Figure 1, the pawl 29 will be positioned in the path of the pins 34 of the ratchet wheel 16, thereby positively preventing the operating bar 18 from being pulled outwardly until the correct number of coins have been deposited in the chute 24, in the present instance, three.

Another important feature of this invention resides in the means provided for adjusting the mechanism so that a certain number of coins must be deposited in the coin chute 24 before the mechanism can be operated. This means is best shown in Figures 2,

3, 5, and 9, and comprises a plate 55 here shown as having a T-head 56 provided with offset portions 57 and 58 adapted to straddle the depending portion 59 of the coin chute 24, as shown in Figures 2 and 3. The offset portions 57 and 58 are provided with apertures 61 adapted to receive suitable pins 62 secured to the end walls of the chute 59 to provide a hinged connection between the plate 55 and the chute. A plurality of spaced slots 63, 64, 65, and 66 are provided in the plate 55 adapted to receive tongues 67 and 68 provided upon a coin stop member 69, which is adjustably mounted upon the plate 55 by means of the tongues 67 and 68 and a pair of upturned lugs 71, preferably struck out of the metal forming the plate 55. The lugs 71 have their end portions bent in parallel relation to the plate 55 and spaced therefrom so as to receive the stop member 69 as best shown in Figure 9. In Figure 9, the member 69 is positioned so that the mechanism will require three coins to be inserted into the chute 24 before it can be operated to eject an article from the vending machine (see Figure 2). Referring to Figure 5, it will be noted that the tongue 67 is relatively longer than the tongue 68 and is adapted to project through one of a plurality of slots 72 provided in the adjacent wall of the chute 59.

The offset portion 58 of the plate 55 has an upstanding portion 73 which extends upwardly back of the guide 39, as shown in Figures 2 and 3, and is provided at its upper end portion with an inclined lip 74 normally positioned in the path of the leading edge 75 of the bracket 49. When the operating bar 18 is pulled outwardly, the leading edge 75 of the bracket 49 will engage the inclined lip 74 and cause the lower end of the plate 55 to be swung outwardly, as indicated by the dotted lines in Figure 5, thereby moving the tongue 67 out of the path of the lowermost coin positioned in the chute 59, whereupon the three coins will drop by gravity into a coin receiving box 76 secured to a side wall 4 of the vending machine, as shown in Figure 6. As soon as the purchaser releases his grip on the operating bar 18, the spring 38 will return the bar to its normal position, shown in Figure 1, and the plate 55 will be returned to its normal position as shown in full lines in Figure 5. The plate 55 may be returned to its normal position either by gravity or by a suitable spring.

Means are provided for manually moving the dog 17 out of engagement with the ratchet 16 so that the conveyer may be returned to its starting position, shown in Figure 6. Such means is here shown as consisting of a lever 77 supported upon a pivot 78 and having one end of a link 79 pivotally connected therewith as best shown in Figure 2. The lower end of the link 79 is shown provided with an offset flange 82 positioned beneath the dog 17 in such manner that when the dog is in its normal position, as shown in Figure 1, and the lever 71 is depressed, the flange 82 on the lower end of the link 79 will engage the dog and move it upwardly out of engagement with the teeth of the ratchet wheel 16, as indicated in dotted lines in Figure 1. When the dog is thus positioned, the conveyer may be manually returned to its normal starting position so that the fingers 11 will be positioned directly beneath the hinged top wall 6. The shaft 15 is shown provided with a squared end 83 adapted to receive a suitable crank 84 as indicated by the dotted lines in Figure 7. This crank may be inserted through a suitable aperture provided in the side wall of the casing.

Means are also provided for indicating when the vending machine is empty of articles. Such means is shown in Figures 1 and 8 and comprises a plate 85 positioned to close an opening 86 provided in the front wall of the machine casing, as clearly shown in Figure 8. Upon the plate 85 may be printed the name of the article being dispensed, and directly beneath the name of the article on the same plate, the word "Empty" is printed as indicated in dotted lines in Figure 8. When one or more of the compartments formed by the spaced fingers 11 on the conveyer chains 9 are filled with articles, the plate 85 will be positioned as shown in Figure 8, but as soon as the last article has been vended. the plate will be elevated so that the word "Empty" will appear in the opening 86, thereby indicating that all the articles or papers have been sold. The plate 85 is also provided with an offset portion 87 adapted to close the coin slot 24 when the plate is moved upwardly to indicate that the machine is empty, thus preventing anyone from inserting coins into the coin chute when the machine is empty.

The means provided for operating the plate 85 is shown in Figure 1 and consists of a lever 88 pivotally mounted upon a pin 89 secured to the side wall of the casing. The end portion 91 of the arm 88 has the lower end of a connection 92 connected therewith, the upper end of which is secured to the plate 85. The connection 92 is slidably supported in a suitable guide 93 shown in dotted lines in Figure 8. The opposite end portion 94 of the lever 88 is positioned in the path of a rod 95 secured to the conveyer chains 9 as shown in Figures 6 and 7. When the last article supported upon the conveyer has been discharged onto the inclined plate 25, the projecting end of the rod 95 will strike the end portion 94 of the lever 88 and move it to the dotted line position shown in Figure 1, whereby the plate 85 will be moved upwardly so that the word "Empty" will appear in the opening 86. At the same time, the coin slot 24 will be closed by reason of the projection

87 being moved upwardly to the dotted line position shown in Figure 8.

In the operation of this novel vending machine, the member 69 is positioned upon the plate 55 so that a predetermined number of coins must be inserted into the coin chute 24 before the mechanism can be operated to eject an article. In the present instance, the member 69 is shown positioned for three coins. When three coins have been inserted into the coin chute, the operator may grasp the grip 23 of the operating rod 18 and pull it outwardly, whereupon the slide 37 will be moved in a direction towards the coin chute because of the pin 48 engaging the end portion 51 of the latch member 42. Such movement of the slide 37 will cause it to shove the top coin against the relatively shorter slide 32 which, in turn, will cause the pawl 29 to be moved from the position shown in Figure 3 to that shown in Figure 2. Continued forward movement of the operating bar 18 will cause the dog 17 to engage one of the teeth of the ratchet wheel 16 and rotate the wheel one tooth. Before the forward movement of the operating bar is completed, however, the latch member 42 will be moved downwardly because of its upper edge engaging the end 52 of the slot provided in the upper wall of the guide 39, whereupon the spring 53 will immediately return the slide 37 to its normal position against the stop pin 54. Such movement of the slide 37 will permit the coin positioned between the two slides to drop into the chute 59 and thence into the coin receiving box 76, whereupon the slide 32 will return to its normal position by the action of the spring 38, thereby causing the pawl to assume its normal position in the path of the pins 34 provided on the ratchet wheel 16.

During forward movement of the operating bar 18, it is to be understood that the plate 55 carrying the coin arresting member 69 will be moved to an inoperative position because of the leading edge of the bracket 49 engaging the inclined lip 74 of the upstanding portion 73, of the member 69. When the operating bar is returned to its normal position, the plate 55 will also return to its normal position shown in full lines in Figure 5.

The position of the stop arresting member 69 upon the plate 55 may be quickly changed by simply moving the lug or offset end portion 68 out of the slot 66, whereupon the member 69 may be moved out of engagement with the lugs 71, after which it may be removed from the plate 55 and secured thereto in another position. If the article to be vended necessitates the insertion of four or five coins into the chute, the coin arresting member may be inverted upon the plate 55 so that the lug 67 will project through either the slot 65 or the slot 66. When thus positioned, the offset end portion 68 will be received in either the slot 63 or the slot 64.

The novel coin actuated mechanism featured in this invention is very simple in operation and comprises few parts. The plate 55 and the coin arresting member 69 provide means whereby the mechanism may be quickly adjusted for operation with two, three, four, or five coins, as the case may be. It will also be noted that the ratchet wheel locking pawl 29 can be moved only when a coin is positioned between the adjacent ends of the slides 32 and 37, thereby positively preventing anyone from operating the mechanism unless the correct number of coins have been inserted into the coin chute. By increasing the lengths of the chute portion 59, plate 55, and coin stop member 69, the mechanism may be adjusted so that it will be necessary to insert six or more coins into the coin chute 24 before the machine can be operated.

I claim as my invention:

1. A coin operated mechanism including a ratchet wheel, an operating bar having means adapted to engage and rotate said ratchet wheel, a pawl normally positioned to prevent rotation of the ratchet wheel, a coin chute, means connected with said pawl and positioned adjacent to the coin chute, means adapted to be actuated by movement of said operating bar in one direction to cause a coin positioned in said chute to actuate the means connected with said pawl whereby said pawl will be moved out of locking engagement with the ratchet wheel to permit rotation thereof upon continued movement of the operating bar, and means for returning said coin engaging means to its normal position before said operating bar has completed its forward stroke.

2. A coin operated mechanism including a rotatable member, an operating bar, means thereon adapted to engage and rotate said member, a pawl normally positioned to prevent rotation of the member, a coin chute, means connected with said pawl and positioned adjacent to said coin chute, a slide adapted to be actuated by movement of said operating bar in one direction to cause a coin positioned in said chute to actuate the means connected with said pawl whereby the latter will be moved out of locking engagement with the rotatable member to permit rotation thereof, a plate pivoted to the coin chute, a coin stop member on said plate, a lug on said stop member projecting into the coin chute to intercept the passage of coins therethrough, means on the operating bar for causing said plate to be oscillated when the bar is operated, whereby coins retained in the chute will be discharged therefrom, and means on said plate whereby said stop member may be relatively adjusted upon the plate so that the mechanism will require the insertion of a predetermined number of coins into the coin

chute before the operating bar can be operated.

3. A coin actuated mechanism comprising a ratchet wheel, an operating bar mounted for sliding movement and having a dog adapted to engage and rotate said ratchet wheel upon movement of the bar in one direction, a coin chute, a pawl normally positioned to prevent rotation of said ratchet wheel, a slide connected with said pawl and having one end positioned adjacent to said chute, a second slide substantially alined with said first mentioned slide and normally having one end spaced therefrom whereby a coin may be inserted between said slides, a pivoted latch member on said second mentioned slide, and means on said operating bar adapted to engage said latch member and cause the slide to be moved forwardly when said operating bar is operated, whereby a coin positioned between said slides will cause the pawl to be moved to an inoperative position to permit rotation of the ratchet wheel.

4. A coin actuated mechanism comprising a rotatable member, an operating bar having a dog adapted to engage and rotate said rotatable member upon movement of said bar in one direction, a coin chute, a pawl normally positioned to prevent rotation of said member, means connected with said pawl and having one end positioned adjacent to said chute, a slide substantially alined with said means and normally having one end spaced therefrom whereby a coin may be inserted between said slide and said means, a spring-actuated latch member on said slide, a pin on said operating bar adapted to engage said latch member and cause the slide to be moved forwardly when said operating bar is operated whereby a coin positioned between said slides will cause the pawl to be moved to an inoperative position to permit rotation of the rotatable member, and means whereby the mechanism can be adjusted so as to require the insertion of a predetermined number of coins into the coin chute before the operating bar can be operated.

5. A coin operated mechanism including a rotatable member, an operating bar, means thereon adapted to engage and rotate said member, a pawl normally positioned to prevent rotation of the member, a coin chute, means connected with said pawl and positioned adjacent to said coin chute, a slide adapted to be actuated by movement of said operating bar in one direction to cause a coin positioned in said chute to actuate the means connected with said pawl whereby the latter will be moved out of locking engagement with the rotatable member to permit rotation thereof, a plate pivoted to the coin chute, means on said plate projecting into said coin chute to intercept the passage of coins therethrough, and means on the operating bar for causing said plate to be oscillated when the bar is operated, whereby coins retained in the chute may be discharged therefrom.

6. A coin operated mechanism including a rotatable member, an operating bar, means thereon adapted to engage and rotate said member, a pawl normally positioned to prevent rotation of the member, a coin chute, means connected with said pawl and positioned adjacent to said coin chute, a slide adapted to be actuated by movement of said operating bar in one direction to cause a coin positioned in said chute to actuate the means connected with said pawl whereby the latter will be moved out of locking engagement with the rotatable member to permit rotation thereof, a plate pivoted to the coin chute, a coin stop member adjustably mounted on said plate and having means projecting into the coin chute to intercept the passage of coins therethrough, and means on the operating bar for causing said plate to be oscillated when the bar is operated, whereby coins retained in the chute may be discharged therefrom.

7. A coin operated mechanism having a coin chute, a member adapted to be driven, an operator therefor, a device for locking said member against movement, a slide mounted adjacent to said chute and adapted to engage a coin positioned therein, an element on said slide normally positioned to be engaged by the operator whereby when a coin is positioned in said chute and said operator is actuated, said locking device will be moved out of engagement with said driven member whereby the latter may be operated, and means for causing said slide to return to its normal position before the operator completes its working stroke.

8. A mechanism comprising a member to be driven, an operator for said member, a locking device normally positioned to lock said driven member against movement, a coin chute, a slide positioned adjacent to said chute and having a portion adapted to enter the chute, means for temporarily retaining a coin in said chute between said locking device and said slide, an element movably mounted on said slide and normally positioned to be engaged by the operator, whereby when the latter is actuated and a coin is positioned in said chute, said locking device will be moved out of engagement with said driven member to permit movement of the latter, and means causing said element to be moved out of operative engagement with said operator before the latter reaches the limit of its forward movement.

9. A mechanism comprising a member to be driven, an operator for said member, a locking device normally positioned to lock said driven member against movement, a slide normally spaced from said locking device, a guide way for said slide, a spring-

actuated latch on said slide having a portion normally offset therefrom and positioned to be engaged by said operator, means permitting an instrumentality to be inserted between said locking device and said slide whereby, when the operator is actuated, said locking device will be rendered inoperative and permit said driven member to be moved, and means for moving said element out of operative engagement with said operator before the latter completes its working stroke.

In witness whereof, I have hereunto set my hand this 9th day of November, 1929.

EGNAR SANDBERG.