Dec. 6, 1938. R. BARES 2,139,433

DISPENSING MECHANISM

Original Filed March 12, 1934 4 Sheets-Sheet 1

Fig. 1

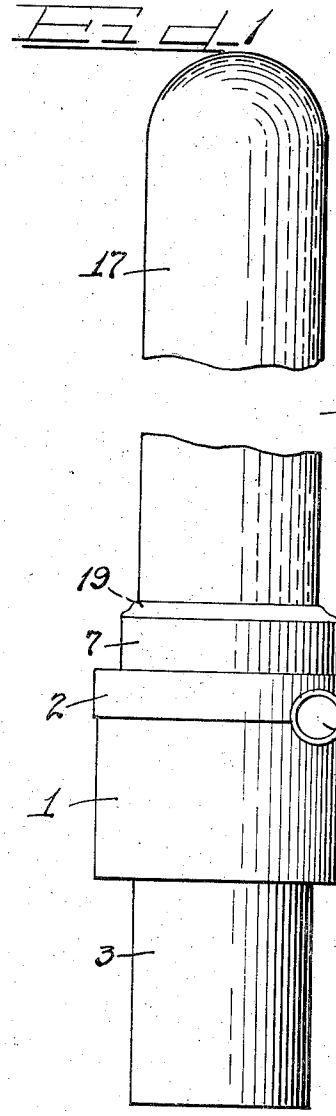


Fig. 3

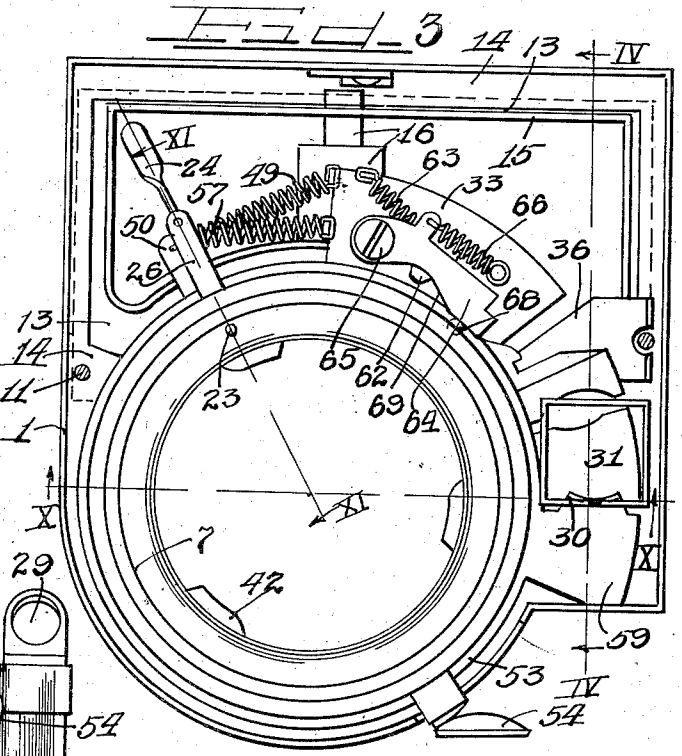
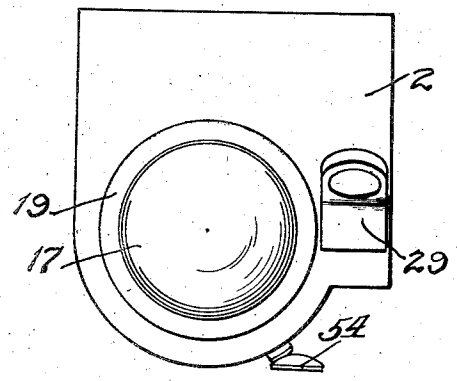


Fig. 2



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Fig. 4

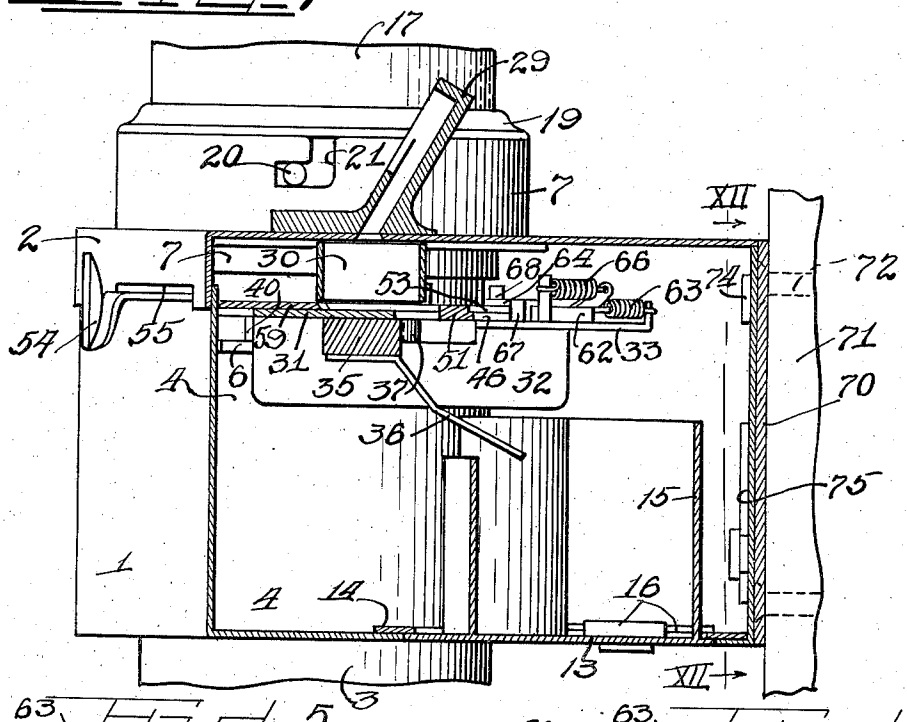


Fig. 5

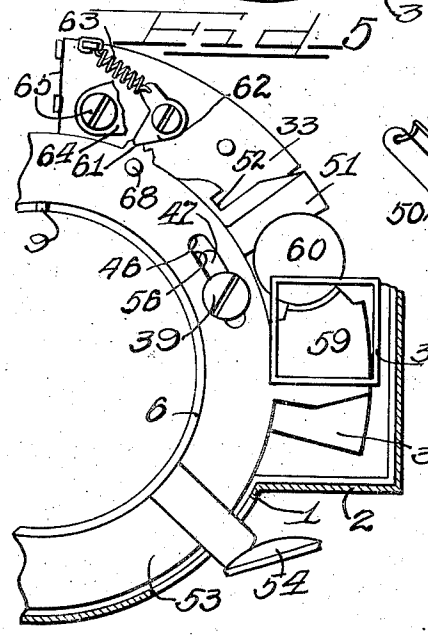
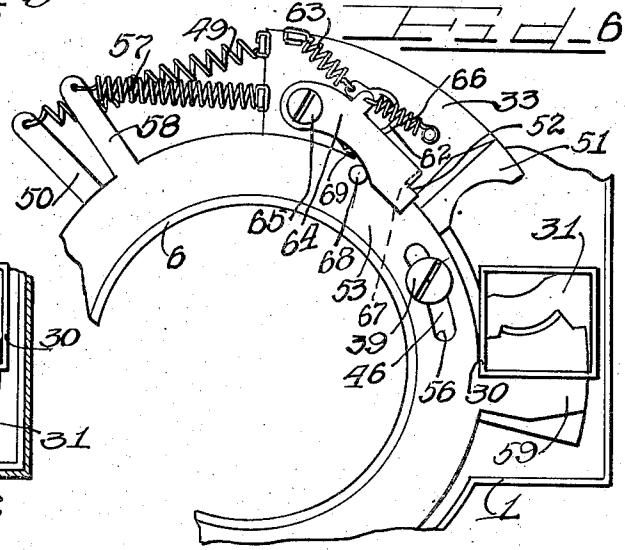


Fig. 6



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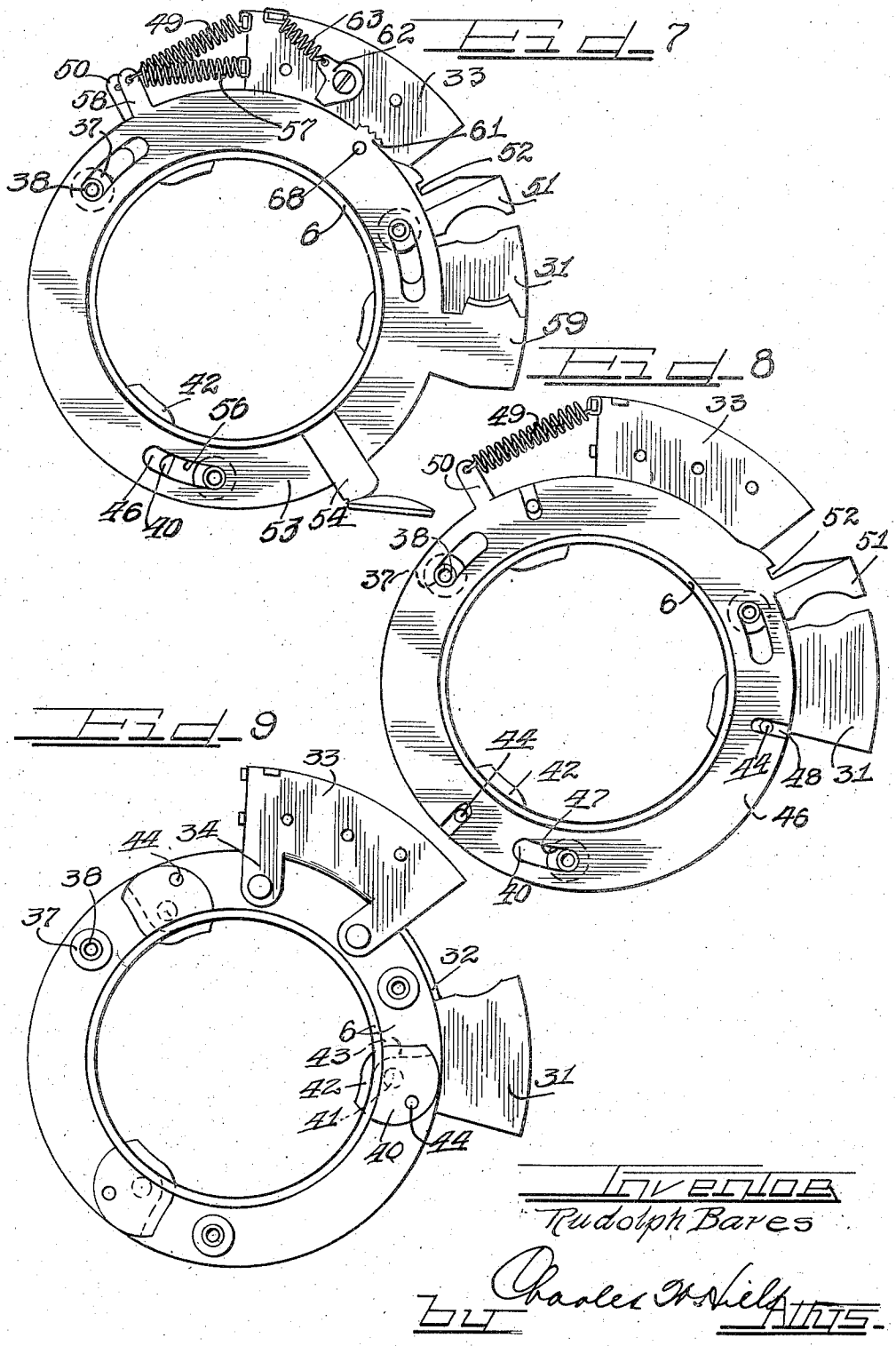
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DISPENSING MECHANISM

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DISPENSING MECHANISM

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Fig. 10

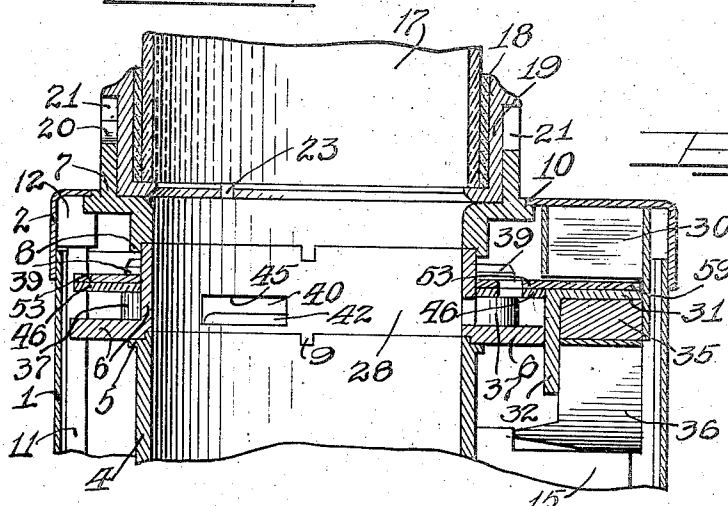


Fig. 13

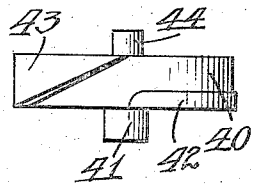


Fig. 11

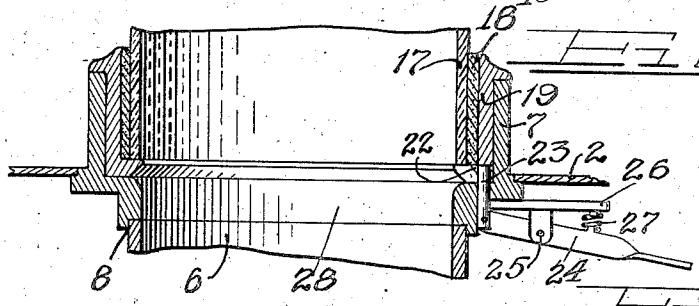


Fig. 14

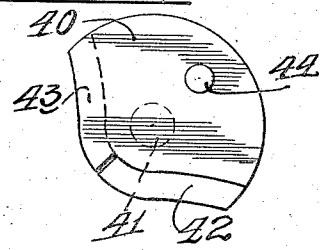
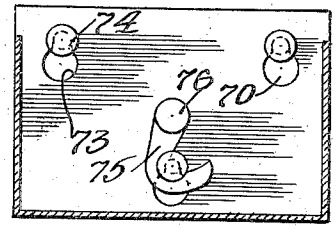


Fig. 12



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Patented Dec. 6, 1938 2,139,433

UNITED STATES PATENT OFFICE

2,139,433

DISPENSING MECHANISM

Rudolph Bares, Chicago, Ill., assignor to Dixie-Vortex Company, a corporation of Delaware

Original application March 12, 1934, Serial No. 715,153. Divided and this application October 8, 1934, Serial No. 747,345

2 Claims. (Cl. 312—35)

This invention relates to improvements in dispensing mechanism or a dispensing machine, and more particularly to the construction and association of parts in a vending machine, the invention being highly desirable for use in connection with such machines of the type rendered operable upon the deposition of a coin for the dispensing of paper cups and the like, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

The present invention embodies divisional subject matter from my co-pending application for Letters Patent entitled "Coin-controlled vending machine", Serial No. 715,153, filed March 12, 1934, and while specific coin-controlled mechanism is herein disclosed and described, such mechanism is claimed in my aforesaid co-pending application.

One of the objects of this invention is the provision of a vending machine including a housing containing the dispensing mechanism proper, and a container for articles to be dispensed removably associated with the housing, there being releasable means for holding the container connected with the housing against unauthorized removal, such means being accessible only through the normally locked interior of the housing.

Another object of this invention is the provision of a vending machine for paper cups and the like, including a housing around the dispensing mechanism proper, and a container for holding a stack of cups removably connected with the housing, and means automatically operable upon the connection of the container with the housing to hold the container against unauthorized removal, such means being only accessible for releasement thereof through the normally locked interior of the housing.

It is also an object of this invention to provide a dispensing mechanism wherein the salient parts are so constructed as to be interfitting and need only be placed one upon the other in assembling the construction, it being only necessary to connect two relatively widely spaced parts by securing means to maintain the composite structure in assembled position.

Also an object of this invention is the provision of a dispensing machine made up of a plurality of separate salient units seated one upon the other.

Still another object of this invention is the provision of a vending machine including a plurality of salient units placed one upon the other, said units when assembled jointly defining a delivery passageway for articles to be dispensed.

A further object of this invention is the provision of a vending machine having a plurality of separable salient parts in the form of units readily placeable one upon the other in interlocking relationship to complete the assembly of the machine in its entirety.

It is also an aim of this invention to provide a vending machine including a unitary structure comprising a dispensing mechanism associated with the machine, said structure being removable and mountable in the vending machine as a unit.

It is also an object of this invention to provide a unitary structure for use in a vending machine, which structure includes coin-controlled dispensing mechanism assembled on a single supporting element, whereby the structure may be removed from or assembled in the machine as a single unit.

Still another aim of this invention is the provision of a vending machine comprising a plurality of separate unitary parts which may be assembled by placing one upon the other, one of said parts including coin-controlled dispensing mechanism, and one of said parts embodying a housing disposed around said mechanism.

Also a feature of this invention is a vending machine including a container for articles to be dispensed from the machine, the container being telescopically associated with a normally closed housing in such a manner that the container is automatically locked against unauthorized removal upon association with the housing, the container only being releasable for removal from the interior of the housing.

While some of the more salient features, characteristics and advantages of the present invention have been above pointed out, others will become apparent from the following disclosures.

The invention includes these and other features of construction and combinations of parts hereinafter described and shown in a preferred form in the drawings, as more particularly indicated by the claims.

On the drawings:

Figure 1 is a fragmentary elevational view of a vending machine embodying principles of the present invention and shown in suitable form for the dispensing of such articles as paper cups and the like.

Figure 2 is a top plan view of the structure shown in Figure 1.

Figure 3 is an enlarged plan view of the struc-

ture shown in Figures 1 and 2, with the article container as well as the top of the mechanism housing removed, certain portions of the figure being shown in section.

Figure 4 is a fragmentary vertical sectional view taken substantially as indicated by the line IV—IV of Figure 3, with a diagrammatic addition to the figure showing one form of mounting the vending machine upon a wall or the like.

Figure 5 is a fragmentary plan view similar to Figure 3, with parts removed to illustrate the dispensing mechanism proper, and showing this mechanism in a more advanced stage of operation.

Figure 6 is a fragmentary plan view similar to Figure 5 and showing the same mechanism in the stage of being restored to initial position after the dispensing of an article.

Figure 7 is a plan view of the dispensing mechanism proper, similar to Figures 5 and 6, with the housing, coin receptacle and container supporting neck removed.

Figure 8 is a view similar to Figure 7, with the manually operable actuating ring removed.

Figure 9 is a view similar to Figures 7 and 8, with the escapement controlling ring removed.

Figure 10 is a fragmentary vertical sectional view taken substantially as indicated by the line X—X of Figure 3.

Figure 11 is a fragmentary vertical sectional view taken substantially as indicated by the line XI—XI of Figure 3, with parts removed and parts shown in elevation.

Figure 12 is a reduced vertical sectional view taken through the housing with the cover thereof removed, substantially as indicated by the line XII—XII of Figure 4.

Figure 13 is an enlarged elevational view of one of the escapement members of the dispensing mechanism.

Figure 14 is a top plan view of the escapement member shown in Figure 13.

As shown on the drawings:

In the illustrated embodiment thereof, the present invention is shown as adapted for use in connection with vending machines or dispensers for paper cups and the like, the invention in general comprising an open bottomed container for a stack of such cups and means forming a cup passageway as a continuity of the opening in the bottom of the container. Escapement members project into the passageway from the dispensing mechanism which is operated externally of the passageway. The coin-controlled mechanism, which may be associated with the present invention if so desired, is all encased within a housing disposed around the passageway, which passageway projects beneath the housing, at which point delivery of a dispensed cup is made.

In the illustrated embodiment of the invention, there is seen a closed housing **1** including a removable cover **2** having a downwardly turned flange around the forward portion of the housing and normally secured tightly to the housing. The coin-controlled dispensing mechanism is all contained within this closed housing. Secured to the housing in any desired manner and projecting therebeneath is a hollow delivery chute **3** which may be equipped adjacent the lower end thereof with suitable detent means to check the fall of a dropping cup so that a dispensed cup may project beneath the chute where it may be easily removed by the purchaser. An extension **4** of the delivery chute **3** projects upwardly within the housing, and this extension **4** (Figure 10) may either be integral with the chute **3** or a separate piece of similar construction resting upon the top of the chute **3**. As is more apparent from the showing in Figure 10, the upper end of the extension **4** is flanged outwardly as at **5** to provide an annular shoulder for intimate seating engagement with a complementarily shouldered mechanism supporting ring **6**. This ring **6** has a vertically extending flanged portion forming a part of the cup passageway, and a horizontally extending flanged portion which, as will more fully appear later herein, supports all of the dispensing mechanism. A container supporting ring **7**, provided with a downwardly extending flange and shouldered as at **8**, seats upon the upper end of the ring **6**. As each of the parts **4**, **6** and **7** are placed in position, suitable alignment and rigidity are readily obtained by means of similar key and slot connections **9** between adjacent parts. It will be noted that the container supporting ring **7** is provided with an outwardly extending annular flange shouldered as at **10** for intimate engagement by the cover **2** so that the parts are retained against longitudinal separation by means of the housing **1** together with its cover. This retention is insured by means of bolts **11** each having its head engaged with the bottom of the housing and the opposite end threadedly engaged with a suitable socket **12** on the inside of the cover **2**. It is also apparent that the relative units of the vending machine or dispenser may be readily assembled by simply placing these units one upon the other and holding them in this position by the easy expedient of engaging the bolts **11** in their respective sockets **12**.

Access to the interior of the housing **1** is obtained through a door **13** (Figures 3 and 4) which fits into a suitable aperture in the bottom of the housing against an interior marginal plate **14** whereby the bottom face of the housing with the door in position is rendered flush. This door or closure **13** carries thereupon a suitable coin receptacle **15** curved to fit around the chute extension **4**. Of course, the door is provided with suitable locking mechanism **16** including a bolt extending through an aperture in the receptacle **15** to overlie the marginal plate **14** of the housing, as seen clearly in Figures 3 and 4. As seen more clearly in Figure 3, the bolts **11** have their heads engaged with the marginal flange **14**, and the door **13** overlies the heads of these bolts so that access to the bolts is only obtainable after the removal of the door.

A container **17** for articles to be dispensed is, in this instance, shown as vertically projecting above the housing **1** and as comprising a suitable glass or transparent tube for containing a stack of paper cups or the like. The tube **17** is held by cementitious material **18** in a base ring **19** flanged in a suitable manner to fit within the container supporting ring **7** and overlie the top of the ring to enhance the appearance of the dispenser. On opposite sides thereof the container **17** is provided with outwardly extending pins **20** receivable within suitable bayonet slots **21** (Figure 4) in the supporting ring **7** whereby the base of the container may be inserted in the ring **7** and anchored therein by a slight twist.

To prevent unauthorized removal of the container together with its contents, the base ring **19** of the container is notched as at **22** (Figure 11) for the reception of a dog **23** passing through a suitable aperture in the container supporting ring **7** and pivoted to the inner end of an actu-

ating lever 24. This lever 24 is intermediately pivoted as at 25 to a lug depending from a plate or bar 26 secured to the underside of the flange on the ring 7. Between the plate 26 and the lever 24 on the opposite side of the pivoted locking pin 23, a spring 27 is disposed to normally urge this end of the lever downwardly and maintain the locking pin in locking position. With the pin in such position, the container 17 cannot be rotated sufficiently to release the bayonet slot connection. As is seen clearly in Figure 11, all of the parts of the locking mechanism are disposed beneath the cover 2 of the housing and are only accessible from the interior of the housing after the removal of the door 13, whereupon the outer end of the lever 24 can easily be raised the container. When the container is placed to retract the pin and permit the removal of back into position, no attention need be paid to the locking mechanism therefor, since the pin will automatically assume locking engagement in the notch 22.

From the foregoing description of the assembly of the various units of the apparatus, all of these units being hollow and of substantially equal diameter, it will be seen that a continuous cup passageway or chute 28 (Figures 10 and 11) is formed from the container 17 to the chute portion 3 projecting below the housing. As will more fully appear later herein, the cups are checked in their descent through the passageway by suitable dispensing mechanism supported by the ring 6, such mechanism being external to the cup passageway, but portions thereof projecting through suitable openings in the vertical portion of the ring 6 into engagement with the cups to be dispensed.

The dispensing mechanism involved in the present invention is preferably entirely carried by the ring 6, including both the escapement mechanism and also the coin-operative mechanism associated therewith. It is therefore apparent that the entire dispensing mechanism may be removed and replaced as a separate and individual unit. When the mechanism is to be coin-controlled, as shown, it is preferably inoperative to dispense an article until after the deposition of a coin, slug, token or the like, whatever may be the proper operating piece in keeping with the circumstances.

In passing through the mechanism, the coin is first inserted in a suitable coin chute 29 mounted upon the cover 2 of the housing, and after leaving the chute through a suitable aperture in the cover 2, the coin enters an open bottomed receptacle 30 (Figures 4 and 10). A bottom plate 31 is disposed a distance substantially the thickness of a coin below the receptacle 30 and deposited coins will lie flatly in successive order upon this plate. The plate 31 is preferably a bent-over portion integral with an arcuate member 32 embracing the horizontal portion of the mechanism supporting ring 6. Spaced from the plate 31, the member 32 also carries a second plate-like portion 33 disposed on a slightly lower level than the plate 31. Arms 34, extending inwardly from the plate 33 and being secured by suitable studs to the horizontal portion of the ring 6, retain the arcuate member 32 in fixed rigid position (Figure 9). As seen better in Figure 10, a block 35 is secured to the under side of the plate 31, and an extension of the outer side of the receptacle 30 is secured to the block in any desired manner. Also secured to the block 35 on the under side thereof is a sloping coin chute 36 positioned to discharge coins into the receptacle or money box 15 upon the door 13 of the housing. As will appear more fully later herein, a coin resting flatly upon the plate 31 will be first gripped by the mechanism, moved until an article has been dispensed and then released so as to fall upon the chute 36 and ultimately be discharged into the money box 15.

With reference now to Figures 9 and 10, it will be seen that upstanding studs 37 are secured at spaced intervals to the horizontal portion of the mechanism supporting ring 6. Each of these studs is provided with an upstanding, smooth, reduced shank 38 internally threaded to accommodate a bolt 39 (Figures 5, 6 and 10) for a purpose that will later appear.

Again with reference to Figures 9 and 10, it will be seen that a plurality of escapement members 40 are pivotally carried directly by the horizontal portion of the ring 6 at various points between the studs 37. These escapement members perform the actual individual releasement of articles to be dispensed, and, in the illustrated embodiments, their particular form and operation are substantially as set forth, described and claimed in a co-pending application filed June 5, 1933, in the name of Cesare Barbieri, entitled "Dispenser", Serial No. 674,352, now issued in Patent No. 2,037,751.

In Figures 13 and 14, I have illustrated one of the individual escapement members 40, and it will be seen that it comprises a body portion having a pivot stud 41 projecting therebelow which is loosely seated in a suitable aperture in the ring 6. The top of the stud 41 is flush with the upper face of the escapement member. Adjacent the lower portion thereof, the member 40 carries an inwardly projecting escapement ledge 42 normally engaged beneath the flange of the lowermost cup of the stack contained in the dispenser. Projecting around the body of the member 40 in the opposite direction from the ledge 42 is a wedge-shaped extension 43 having a flat top and a sloping under surface. When the escapement member is pivoted by means of an upwardly extending pin 44 on the top of the member, the ledge 42 is removed from engagement with the flange of the lowermost cup of the stack, and the wedge-shaped portion 43 enters between the aforesaid flange and the flange on the next lowermost cup, the inclined surface 43 camming the lowermost cup from the stack, permitting it to fall through the passage 28 in the dispenser, all in a manner more fully set forth in the aforesaid co-pending application. Of course, all of the escapement members are operated in unison and the vertical portion of the ring 6 is provided with suitable slots 45 (Figure 10) through which the ledges 42 and wedge-shaped portions 43 of the members may project into the cup passageway.

For the uniform and simultaneous actuation of the escapement members 40, an actuator ring 46 is provided which rotatively embraces the vertical portion of the ring 6 and rests upon the upper surfaces of the studs 37, the ring 46 being provided with elongated slots 47 to loosely embrace the smooth shanks 38 projecting upwardly from the studs 37 (Figure 8). The height of the studs 37 (Figure 10) disposes this actuating or escapement ring 46 substantially in the same plane as is the plate 31 beneath the coin receptacle 30. Notches 48 are cut in the ring 46 at proper intervals to receive the pins 44 projecting upwardly from the escapement members, these

pins 44 being of a height substantially equal to the thickness of the ring 46. Accordingly, a rotation of the ring 46 within the limits defined by the slots 47 results in a sufficient movement of the escapement members for the dispensing of an article.

After being moved to dispense an article in a manner that will later appear, the ring 46 is restored to its initial position by means of a spring 49 attached at one end to a lug 50 integral with the ring 46, and at the other end to a suitable projection on the plate member 33. For purposes that will later appear, the ring 46 carries a radially projecting coin engaging arm 51, which arm is thickened, as seen better in Figure 4, to an increased width substantially equivalent to the space between the plate or platform 31 and the coin receptacle 30. Immediately ahead of this arm, in the direction of dispensing motion, the ring 46 is provided with a locking slot or notch 52, mentioned hereinafter.

With reference more specifically to Figure 7, it will be seen that a manually operable ring 53 is disposed directly upon the ring 46 and is also rotatable around the vertical portion of the supporting ring 6. The rings 53 and 46 and the escapement members 40 are retained in position by the heads of the bolts 39. This ring 53 carries a thumb lever 54 thereon which projects through a suitable slot 55 (Figure 4) in the cover of the housing. As is the case with the ring 46, the motion of this ring is also limited by means of slots 56 engaged over the smooth shanks 38 of the studs 37. After dispensing movement, a spring 57, connected at one end to a lug 58 on the ring 53 and at the other end to a suitable detent on the plate 33, restores the ring 53 to initial position.

A coin engaging element 59 also projects from the ring 53 in spaced relationship to the engaging element 51 on the ring 46, these elements being complementary to each other. The coin engaging element 59 overrides the plate 31 beneath the coin receptacle 30, and, as mentioned above, the coin engaging element 51 is thicker so that the upper portions of two elements 51 and 59 are in the same plane with each other. Consequently, a coin 60 (Figure 5) upon being deposited in the chute 29 and descending to a flattened position upon the plate 31 will be gripped between the engaging elements 51 and 59 after a slight movement of the ring 53. The coin so disposed establishes operative connection between the ring 53 and the escapement ring 46 whereby the latter may be actuated by the former for the purpose of dispensing an article. The gripping action upon the coin is maintained by means of the spring 49, against the action of which the escapement ring 46 is moved for the dispensing operation. Without the deposition of a coin to establish such operative connection between the two rings, the ring 53 merely moves relatively to and over the ring 46 and the engaging element 59 will not contact with the engaging element 51, since the latter is beyond the limit of motion permitted by the slots 56.

With reference now to Figures 5, 6 and 7, it will be seen that the slots 56 in the ring 53 are slightly longer than the slots 47 in the escapement ring 46 to permit a full dispensing movement when the ring 46 is actuated by the manually operable ring 53 through the coin 60. As seen in Figure 5, the coin has been deposited, and the dispensing motion begun, the coin having been moved between the elements 51 and 59 off the plate 31. If, for any reason, the purchaser should release pressure upon the thumb lever 54, the coin is not lost in view of the gripping action of the elements 51 and 59, and backward movement of the respective rings is prevented by the engagement of a ratchet 61 on the ring 53 with a bell crank pawl 62 pivoted to the plate 33 and urged into operative position by a spring 63 disposed between the pawl and a suitable lug on the plate 33. Obviously, reverse movement of the ring is prevented until the ratchet 61 is passed completely by the pawl 62, and the parts are so arranged that such motion is sufficient for the escapement ring 46 to actuate the escapement members 40 and dispense a cup.

Of course, means must be provided to effectively release the coin prior to the restoration of the movable elements to their initial positions. To this end, another pawl 64 overlying the pawl 62 is pivoted to the plate 33, as at 65, at one end thereof and the opposite end of the pawl 64 is urged into engagement with the circumferences of the rings 46 and 53 by a suitably mounted springs 66. This pawl 64 carries a downwardly disposed detent 67 thereon (Figure 4) riding on the plate 33. Substantially simultaneously with the completion of the dispensing movement of the ring 46, the pawl 64 engages in the locking notch 52 of this ring and holds the ring against the restorative action of the spring 49. Consequently, when pressure upon the thumb lever 54 is released, the spring 57 immediately moves the ring 53 to its initial position, and since the ring 46 is held by the engagement of the pawl 64, the gripping action upon the coin 60 is released, and the coin drops upon the chute 36 from which it descends into the ultimate coin receptacle 15. The restorative action of the moving parts is shown in Figure 6 shortly after the releasing of the coin, and it will be seen that after the coin has been dropped, an upright stud 68 carried by the ring 54 engages with the cam surface 69 upon the pawl 64 and kicks this pawl out of engagement with the notch 52, leaving the escapement ring 46 free to snap into its initial position due to the action of the spring 49.

If more than one coin has been resting in the receptacle 30, the above described dispensing operations only utilize the bottom coin from the stack in this receptacle since the parts, as explained above, are so arranged that only the lowermost coin of the stack can be removed. The upper coins rest upon the engaging element 59 of the ring 53 during the dispensing operation, and immediately upon restoration to initial position, the lowermost coin in the receptacle 30 will rest upon the plate 31, whereby the dispensing action may be repeated and the proper number of articles is dispensed consistent with the number of coins previously deposited.

In Figures 4 and 12, I have shown one manner of mounting the dispenser. A wall plate 70 may be secured to a wall 71, or some other supporting element, in any desired manner, such as by screws 72. As seen better in Figure 12, the back of the housing 1 projects above the sides thereof, and this back is provided with a plurality of bayonet slots 73 through which studs 74 projecting from the plate 70 may be inserted and the dispenser hung from the shanks of the studs. To maintain the dispenser in hanging position, a hook 75, pivoted as at 76 to the back of the housing 1, may be engaged over the lowermost stud 74, this hook being accessible only from the interior of the housing 1.

The simple and effective operation of the present invention is believed to be sufficiently apparent from the foregoing, so that little further explanation need be given herein. In the event no coin is deposited, no article can be dispensed from the machine, even though the thumb lever 54 be actuated, because the plate 53 will move relatively to the escapement plate 46 and the latter will not move at all. Upon the deposition of a coin which will pass through the chute 29 striking the edge of the adjacent element 59 and laying flatly upon the plate 31, a movement of the lever 54 slides the coin along the plate 31 into engagement with the coin engaging element 51 on the escapement ring 46. With the reaction of the spring 49 on the escapement ring, the coin will be grippingly held between the engaging elements 51 and 59. Accordingly, the escapement ring 46 will be actuated through the coin, and the pawl 62 and ratchet 61 effectively prevent releasement of the coin until a complete dispensing movement has been made.

As the escapement plate 46 is urged around in a counter-clockwise direction as viewed in the drawings, the escapement members 40 will be rotated sufficiently to dispense a cup from the stack in the dispenser. When the thumb lever 54 is released, the ring 53 immediately returns to initial position and the ring 46 is temporarily retained by the pawl 64 sufficiently to release the coin, the stud 68 kicking the pawl out of engagement with the ring 46 and permitting the spring 49 to return that ring to initial position. The pawl 62 together with the ratchet 61 are so arranged as to prevent a reversal of movement before a complete movement has been made in either direction, thereby assuring the dispensing of an article for each coin deposited. If more than one coin is deposited at a time, only one will be kicked out of the receptacle 30 by the coin engagement element 59, and the coin next above will immediately fall into operative position upon the restoration of the parts.

To replace articles in the container 17, it is a simple expedient to remove the door 13 together with the coin collection box 15 upon proper manipulation of the locking means 16, whereupon from the interior of the container the lever 24 may be operated to release the dog 23 from its engagement with the base ring 19 of the container. The container may then be readily removed, refilled and replaced into engagement with the bayonet slots 21 in the container supporting ring 7, the dog 23 automatically assuming locking position. It will be noted that even though the container 17 may be broken, the only thing accessible to the breaker is the contents of the container, it being impossible to reach the coin collection box 15 from the dispensing passageway.

From the foregoing, it will be apparent that I have provided a vending machine or dispenser wherein the relative parts of the apparatus are easy to assemble and dismantle and access to the salient parts of the construction is only available through a locked housing. In addition, it will be noted that the construction, while simple in operation and easily assembled, embodies relatively few parts of agreeable character which are not likely to become out of order through wear of bearing surfaces. Further, the present invention is simple to install and operate and may be economically manufactured.

I claim as my invention:

1. In a dispenser, a plurality of apparatus units assembled one upon the other in interlocked relationship, one of said units carrying complete dispensing mechanism for said dispenser, one of said units carrying a housing around said mechanism, another unit including a container for articles to be dispensed seatable in position on one of the first said units from outside said housing, and locking means accessible from within said housing and automatically operable upon the seating of said container to lock the same in position.

2. In a dispenser of the character described, a plurality of apparatus units assembled one upon the other in interlocked relationship effected by complementally formed shoulders on adjacent units and by means of a projection on a unit engaged in a notch on the next adjacent unit, one of said units including dispensing mechanism, and another being arranged for engagement with a container for articles to be dispensed, a housing around said units, a container seatable on the respective said unit from without said housing, and locking mechanism accessible from within said housing and automatically operable upon the seating of the container to lock the container in position.

RUDOLPH BARES.