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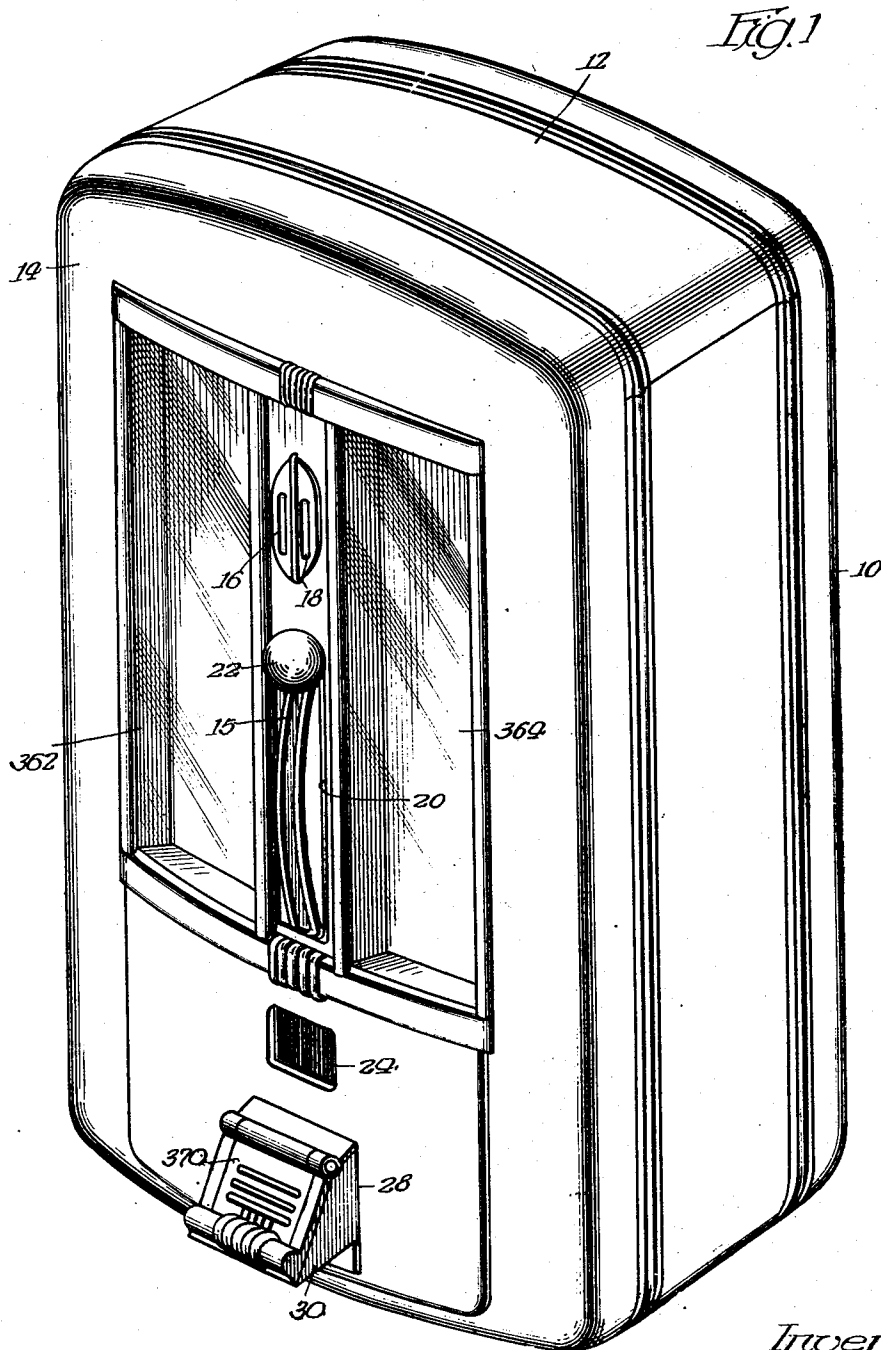
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2,365,165

VENDING MACHINE

Filed June 15, 1940

7 Sheets-Sheet 1



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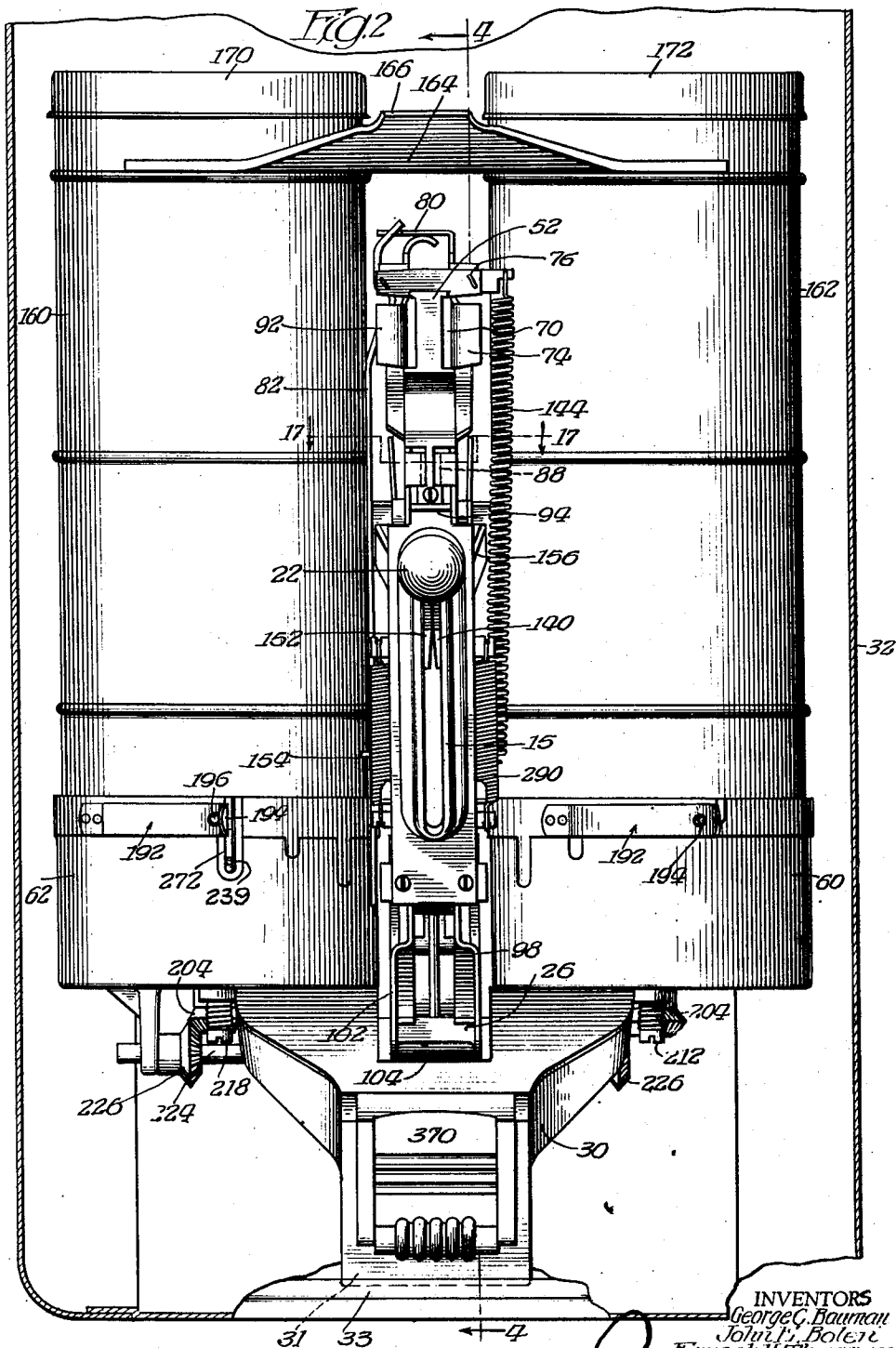
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VENDING MACHINE

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7 Sheets-Sheet 2



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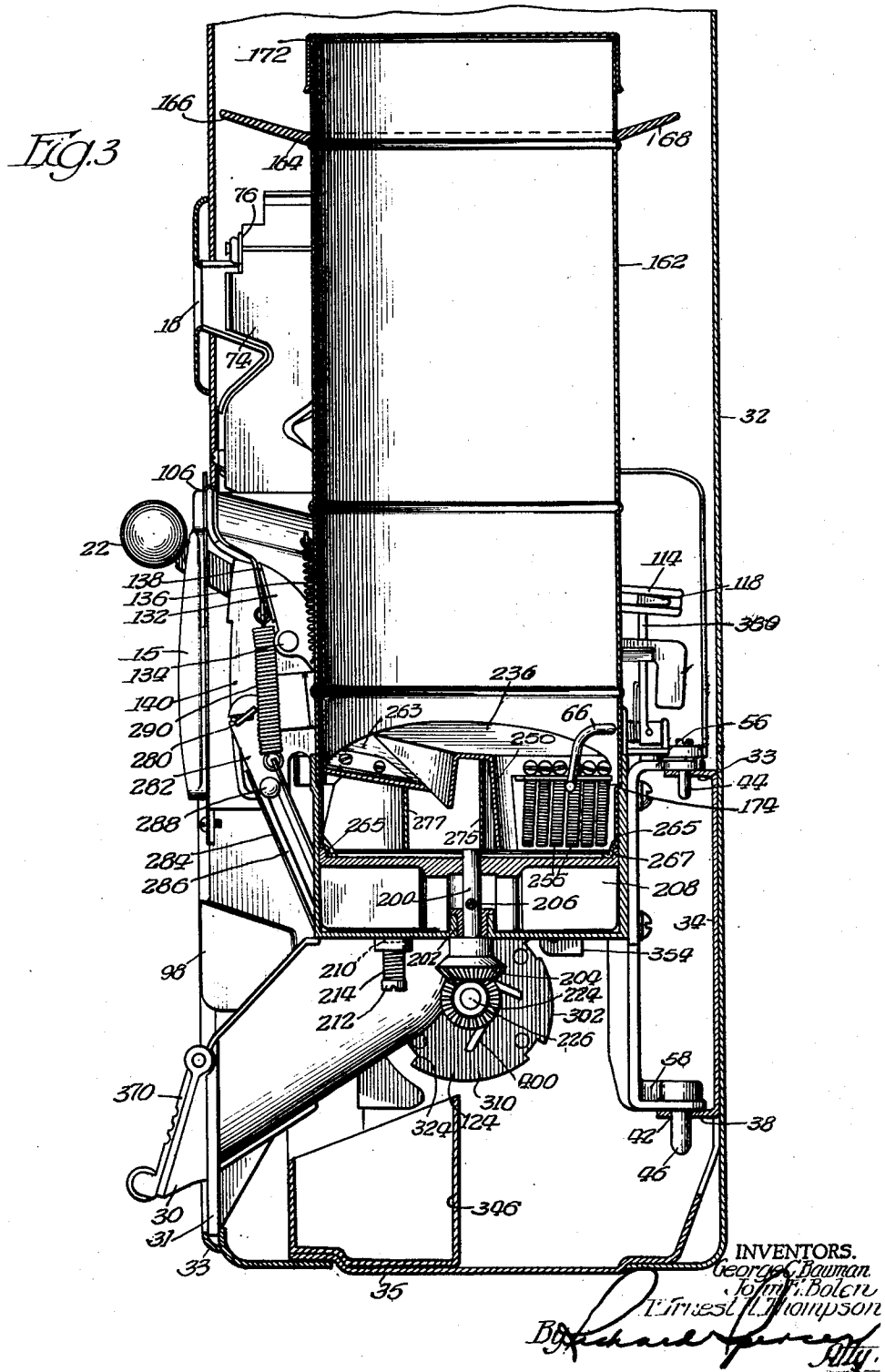
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VENDING MACHINE

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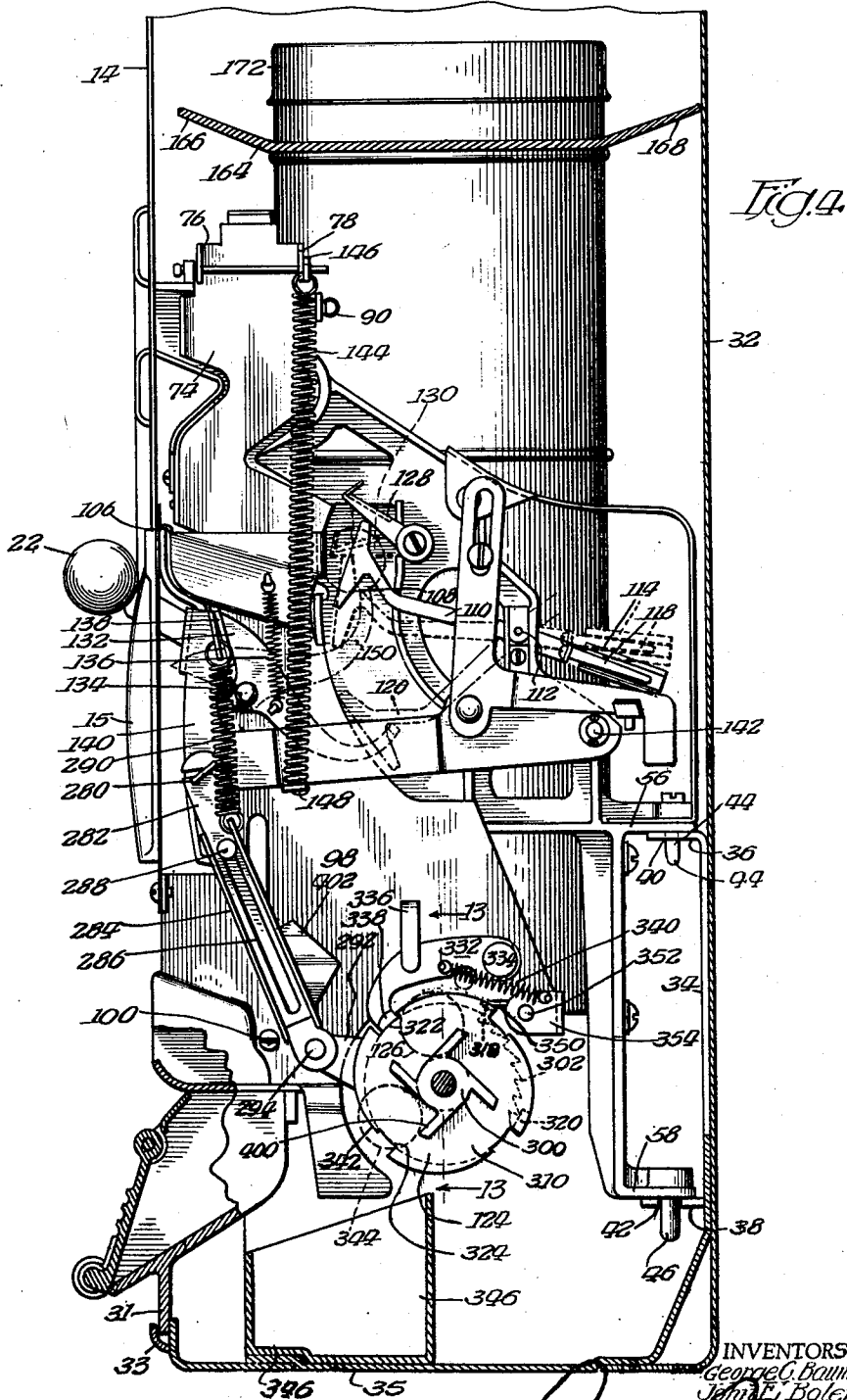
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VENDING MACHINE

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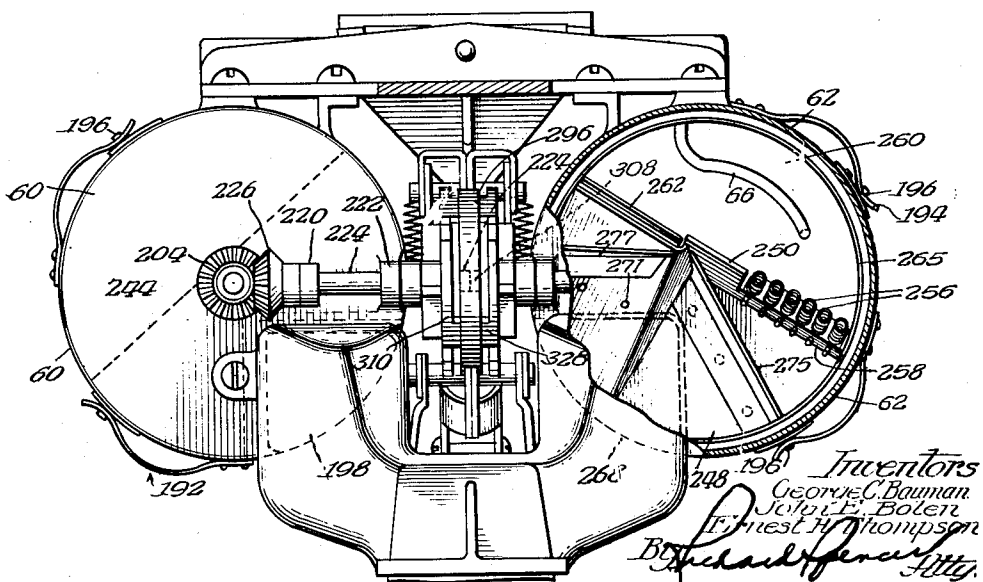
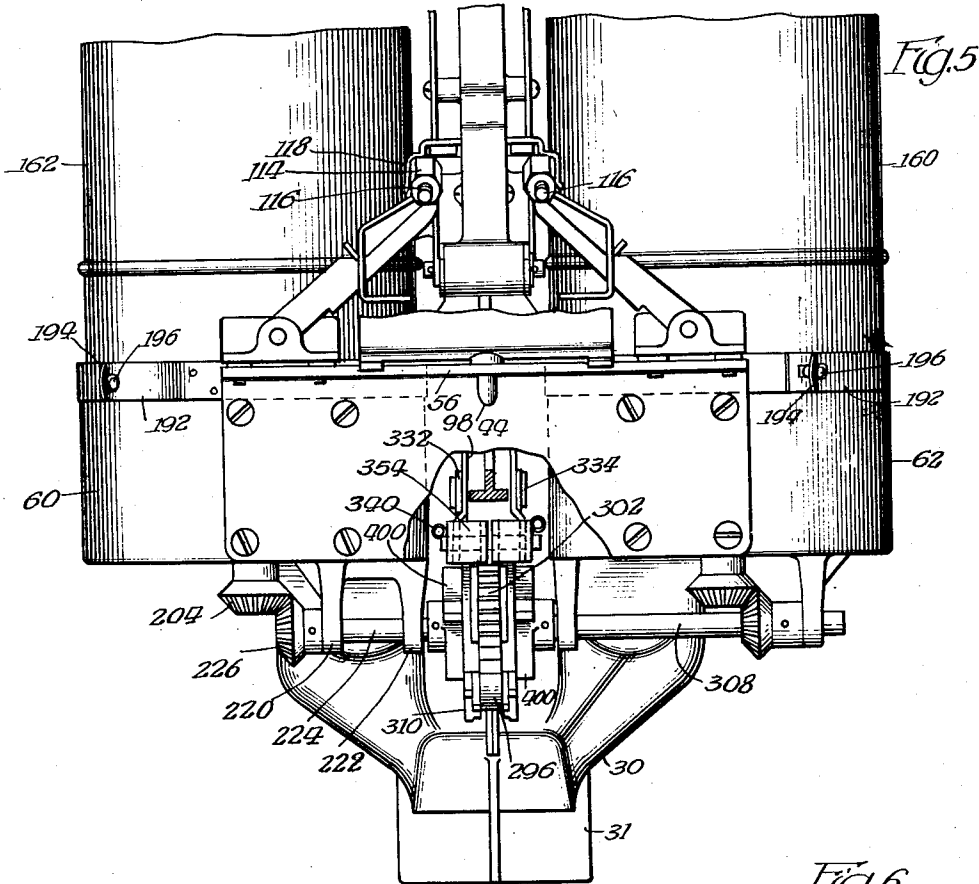
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VENDING MACHINE

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7 Sheets-Sheet 5



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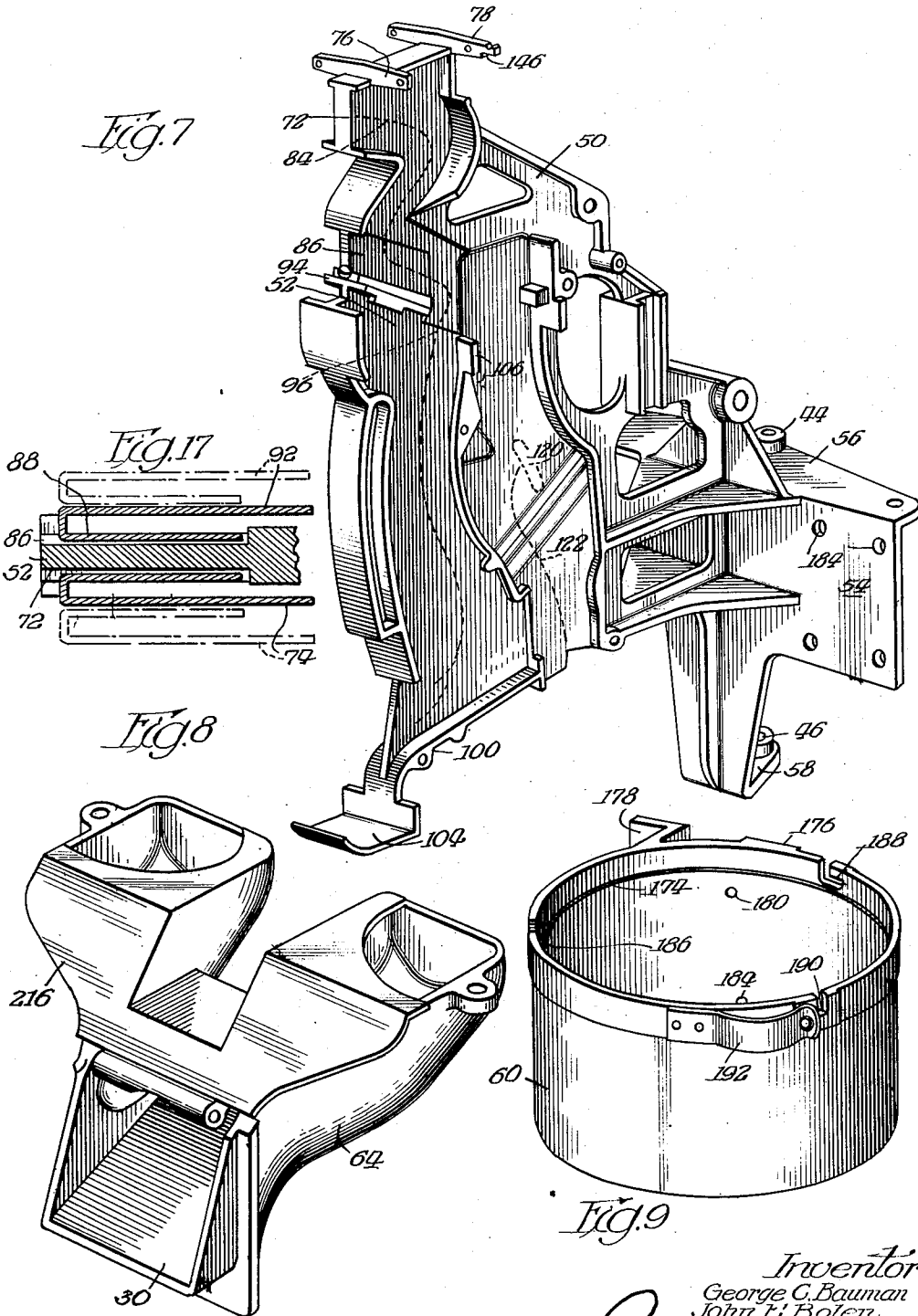
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VENDING MACHINE

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7 Sheets-Sheet 6



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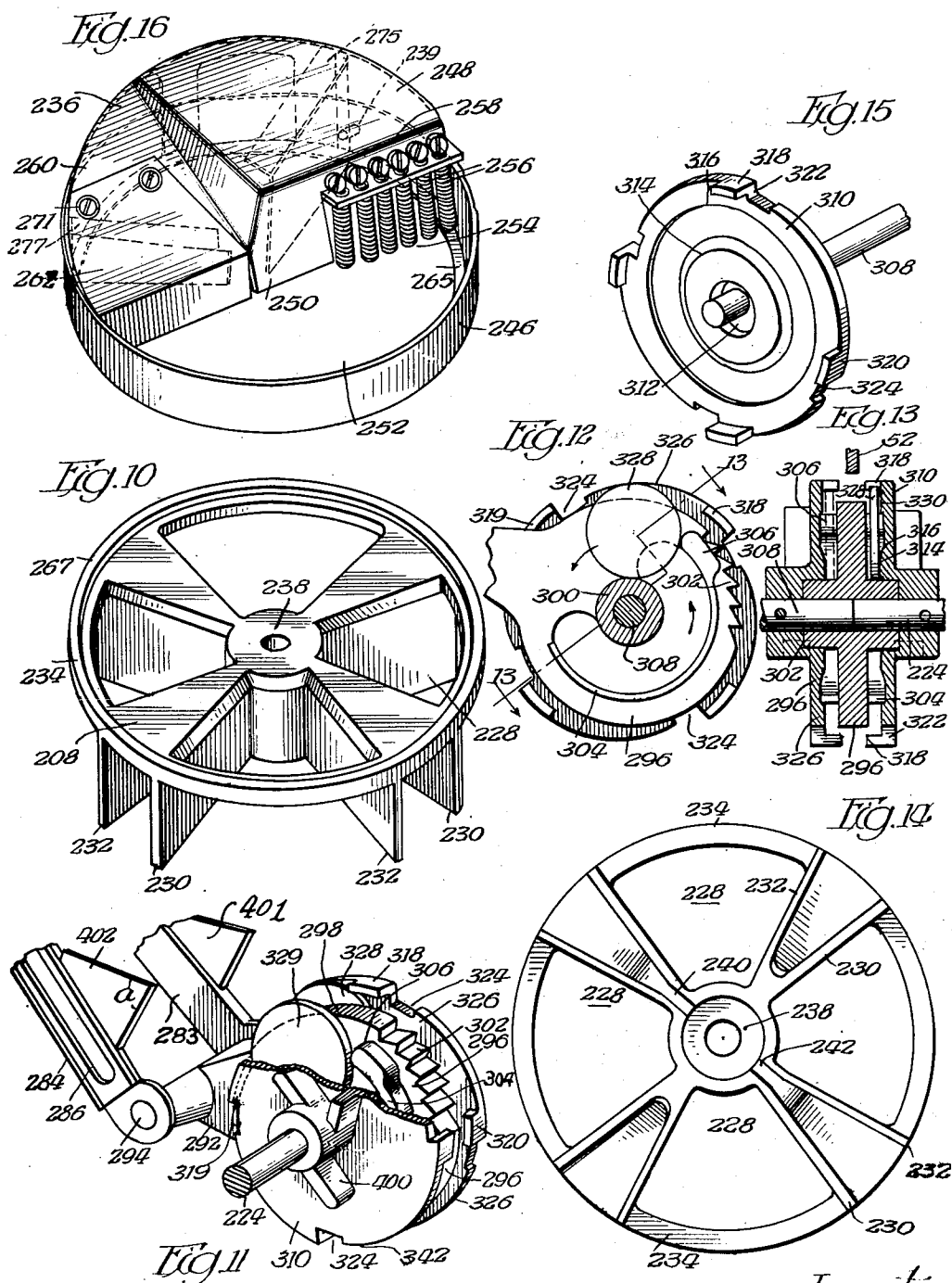
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VENDING MACHINE

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7 Sheets-Sheet 7



UNITED STATES PATENT OFFICE

2,365,165

VENDING MACHINE

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ware.

Application June 15, 1940, Serial No. 340,668

3 Claims. (Cl. 194—85)

This invention relates to improvements in vending machines for bulk material and as illustrated herein has to do with the provision of a coin controlled, selective machine for vending peanuts or the like.

One of the objects of this invention is to provide a means for permitting the quick assembly of the operating elements of a vending machine in a cabinet. A feature contributing toward the attainment of this object in the present invention is a die casting having a principal wall with tracks, shoulders and the like on opposite sides thereof to receive plate members and scavengers for the purpose of forming two complete coin mechanisms, one on each side of the wall, and having other extending portions to which may be fastened all of the other operable elements of a bulk vending machine such as an external control and driving trains, storage bins or magazines, dispensing means for each magazine and empty locks. This central casting preferably carries downwardly directed stud members which may be positioned in seats such as holes formed in the inner wall of the vending machine cabinet so that the entire vending mechanism may be removed from the cabinet by the simple expedient of lifting the central casting out of such seats and holes. The use of a central casting around which the entire vending mechanism is built greatly facilitates the ease of repairing any breakdowns which may occur. It will be appreciated that since coin controlled vending machines are compact and the clearance between the mechanism and the inside walls of the cabinet is small, most repair work is feasible only by removing the mechanism from the cabinet.

Another object of this invention is to provide a new and improved means for keying a single external control into driving engagement with the dispensing means of any selected magazine. The selective vending machine disclosed in this invention is of the type which has a single external control and a plurality of coin slots, one for each storage magazine. The customer performs the act of selection by dropping a coin into a slot indicated on the front of the machine as being in association with the magazine containing the particular merchandise which the customer wants delivered. Thus, by way of example, in the vending machine shown in the drawings, there are two magazines and hence two coin slots. A feature of the invention contributing to the attainment of this object is the provision of a driving disk actuated by the single external control on the machine and having on each side

thereof in operable relationship a driven disk mounted on a shaft which through gearing drives a dispensing means on an associated magazine. The driving disk and the driven disks possess peripheral lugs and are so spaced from one another that a coin such as a penny may be dropped between the driving disk and one of the driven disks so that rotation of the driving disk will by means of the penny and the lugs rotate one of the driven disks. This assembly of the disks and driven shafts is positioned directly beneath the central wall of the die casting heretofore mentioned so that the two coin mechanisms which are disposed in side by side relationship will drop acceptable coins, one between the driving disk and the right hand driven disk and other between the driving disk and the left hand driven disk. By this simple arrangement, it is possible for the machine to deliver a selected kind of merchandise whenever the customer drops a coin into a selected coin slot and actuates a single external control.

Another object of this invention is to provide a new and improved baffle for feeding bulk material, such as peanuts, into a portioning wheel for measuring and delivering selected quantities of the bulk material into a delivery chute. The term "portioning wheel" when used herein refers to a wheel divided into segmental compartments by partitioning walls and usually pivoted along a vertical axis. This wheel is mounted at the bottom of a storage bin or magazine with a baffle disposed thereabove in such a way that the segmental compartments of the portioning wheel will pass under the baffle as they move over an opening into a delivery chute. This baffle prevents a flow of bulk material from a storage bin through the chute. One of the features of this invention is a sloped baffle of semi-circular configuration having a plurality of resilient helixes terminating immediately above the plane of the top of the portioning wheel whereby bulk material above each portioning compartment will be blocked from movement over a delivery orifice with the result that the volume of each portioning compartment will measure the quantity of bulk material which is dispensed on each actuation of the dispensing means. The problem encountered here is that caused by the tendency of the bulk material to jamb at critical points due to the weight of the material above. The sloped baffle directs the bulk material from the storage magazine above into selected compartments of the portioning wheel and the resilient helixes are positioned on the baffle at the point where the forwardly advancing upper edge of the compart-

ment of the portioning wheel passes beneath the lower edge of the baffle. This is the point where jamming of bulk material is most likely to occur.

A further object of this invention is to prevent a customer's jumping bulk material out of a filled compartment in a portioning wheel into the orifice of the delivery chute whereby bulk material may be obtained without the deposit of a coin in the coin mechanism. It is essential that neither shaking nor tipping a vending machine cause the machine to deliver merchandise. One of the features of this invention is the provision of flexible walls which may be described as secondary baffles positioned underneath the main baffle in such a manner as to register with the partitions of the portioning wheel when the latter is in normal position. The result of this arrangement is that no amount of juggling can throw material in a loaded compartment of the portioning wheel over the partitioning wall of that compartment into the orifice of the delivery chute. These secondary baffles assure complete delivery of bulk material in the compartment positioned over the delivery chute and prevent the escape of any material from an adjoining loaded compartment of the portioning wheel regardless of the position of the vending machine.

A further object of this invention is to provide a check upon the movement of the portioning wheel so that rapid actuation of the external control will not cause that wheel to spin, thereby causing more than one compartment of the portioning wheel to pass over the delivery orifice on a single actuation of the machine. A feature of this invention contributing to the accomplishment of this object is the provision of radial arms on the outward faces of the previously mentioned driven disks which arms are formed integral with the disks and are at approximately right angles to each other. During the actuation of the driving disk, a blocking member, which is actuated by the external control, moves in between two of these radial arms with the result that the driven disk can not be spun, either forwardly or backwardly.

Another object of this invention is to assure complete actuation of the external control upon each stroke so as to make it necessary for the customer, in order to obtain his merchandise, to advance the external control to a point where springs will return it to normal position. Toward this end, a plurality of full stroke pawls are provided for use in conjunction with a row of teeth disposed on the driving disk.

Another object of this invention is to provide a means for enabling a customer to return the external control to normal position even though the external control is held in partially actuated position by a full stroke pawl. A full stroke pawl exists for the purpose of holding an external control in partially actuated position so as to indicate visually to a customer that a stroke has not been completed. On the other hand, a customer who is trying to abuse the machine, instead of further pressing the external control downwardly, may try to pull the control upwardly, and, if the external control does not yield, the customer might be able to break one of the moving parts, such as the full stroke pawl. A feature of this invention is the employment of a spring between two lever arms in the driving mechanism. This spring holds the arms in normal relationship but will permit the arms to separate in the event that a return movement of the external control is attempted when the driv-

ing mechanism is held against such movement by a full stroke pawl. By this arrangement a customer can force upwardly the external control to normal position without in any way affecting the position of the driving mechanism.

The empty lock disclosed in this invention is the subject of an application by its sole inventor, Ernest H. Thompson, Serial No. 329,436, filed April 13, 1940.

These and such other objects as may herein-after appear are attained in the embodiment of the invention, shown in the accompanying drawings, wherein:

Figure 1 is a perspective view of the cabinet with the door closed;

Figure 2 is a front view in elevation of the mechanism within the cabinet;

Figure 3 is a side view in elevation of the mechanism with the base of one of the peanut storage magazines partially cut away;

Figure 4 is a view of the coin mechanism taken on the line 4—4 of Figure 2;

Figure 5 is a rear view of the mechanism with the lower supporting arm partly cut away to disclose part of the driving mechanism;

Figure 6 is a bottom view of the mechanism;

Figure 7 is a view of the main casting;

Figure 8 is a view of the merchandise chutes;

Figure 9 is a view of the dispensing means

housing;

Figure 10 is a perspective view of the portioning wheel;

Figure 11 is a perspective view of the driving disk and both of the driven disks with a penny therebetween;

Figure 12 is a side view in elevation showing a coin resting on the hub of the driving disk;

Figure 13 is a view in section of the driving assembly taken on the line 13—13 of Figure 12;

Figure 14 is a bottom plan view of the portioning wheel;

Figure 15 is a view of a driven disk showing the face positioned next to the driving disk;

Figure 16 is a perspective view of the baffle member; and

Figure 17 is a view in section taken on the line 17—17 of Figure 2.

Continuing to refer to the drawings, the numeral 10 identifies a cabinet having a hinged lid 12 and a front door 14. The door 14 overlaps the hinged lid 12 when the latter is in closed position so that a locking means for securing the door 14 in closed position on the cabinet 10 will also serve to maintain the hinged lid 12 in closed position. The front of the cabinet is slotted at 16 and 18 to permit the passage of coins into the receiving slots of a coin mechanism, described hereinafter. Similarly, the slot 20 permits the vertical actuation of an external control 22. A hole 24 registers with a return coin cup 26, see Figure 2, and the hole 28 registers with the delivery chute 30, see Figure 2.

Referring to Figure 4, the back wall of the cabinet is indicated by the numeral 32. To this back wall 32 is fastened by an appropriate means a reinforcing plate 34 having brackets 36 and 38. Holes 40 and 42 in said bracket are positioned to receive the supporting stud members 44 and 46 respectively and, as will appear more clearly hereinafter, by simply raising the entire operable mechanism so that the studs 44 and 46 clear the holes 40 and 42, the operable mechanism may be lifted out of the cabinet. It will be observed in Figure 4 that in the actual construction in the cabinet 10, the reinforcing plate 34 is

part of the bottom 35 of the cabinet. Because the studs 44 and 46 are in vertical alignment, the mechanism can swing appreciably when the door 14 is open. When the door 14 is closed, a guide-member 15 mounted on the principal casting which supports the mechanism, see Figures 1 and 3, rests in the opening 20 of the door 14 and in conjunction with a steadying effect obtained by the depending wall 31 of the chute 30 seating in channel 33, see Figure 3, formed in the lower forward edge of the cabinet 10, prevents lateral movement of the mechanism.

The central casting

One of the features of this invention is the provision of a casting which will serve as the central framework for the entire operable mechanism. Such a casting may be seen in Figure 7 of the drawings where it is identified by the numeral 50. Viewed broadly, it consists of a wall member generally identified by the numeral 52 which, as may be seen in Figure 2, is disposed at right angles to the front of the machine so that a coin mechanism utilizing this wall member 52 may be mounted on each side thereof in operable relationship with a driving mechanism responsive to the external control 22. Returning to Figure 7, a heavily reinforced bracket 54, formed integral with the wall member 52 and at right angles thereto, carries the brackets 56 and 58. In these brackets, 56 and 58, are the stud members, heretofore mentioned, 44 and 46 which may best be seen in Figure 4.

The casting 50 is designed to support two cylindrical housings 60 and 62 for dispensing mechanisms, see Figure 2, one on each side of the wall member 52, a twin delivery chute assembly 64, see Figure 8, an empty lock assembly generally identified by the numeral 66, see Figure 3, the external control 22 together with the driving mechanism actuated thereby and two coin mechanisms one on each side of the wall member 52. It will be appreciated that the casting 50 is particularly designed for use with two coin mechanisms and two storage magazines, but the principle of utilizing a central frame for providing a wall for many coin mechanisms and bulk magazines is evident. Moreover, the opposite sides of the wall member 52 are identical because it is intended in this particular vending machine that both coin mechanisms shall check pennies, but it is evident that the casting could be modified so as to permit the assembly of a nickel coin mechanism on one side of the casting and a penny coin mechanism on the other.

The casting forms a common wall for two adjoining coin mechanisms

The two coin mechanisms utilized in this machine are identical and hence it will only be necessary to describe one of them. It will be appreciated, however, that in vending machines employing this central casting for different types of coin mechanisms, as one for passing nickels and one for passing pennies, the common wall of the casting could be modified to meet needs. In such a case the opposite sides of the wall member 52 would be quite different because a coin mechanism for checking nickels or dimes is not like one for testing pennies, which is the one actually shown and to be described.

Referring now principally to Figure 7, but also to Figures 4 and 2, it will be observed that a coin slot 70, see Figure 2, is formed between the walls of the casting at 72, see Figure 7, and a

scavenger plate 74, see Figure 2, pivoted on the arms 76 and 78, which are formed integral with the casting 50, said scavenger plate 74 having an arm extension 80, see Figure 2, which is coupled to a link 82, which, as will be described hereinafter, is drawn downwardly by the external control 22 in the lowermost portion of its stroke. The scavenger plate 74, see Figure 4, extends downwardly to form with the wall member 52 the side walls of a coin track, identified by the dotted line 84. The wall member 52 carries a recess 86 having a configuration of a parallelogram, although this configuration is not important, into which recess is seated a bracket member 88, see Figure 17, turned inwardly on the scavenger 74 and held within the recess by a spring 90, see Figure 4, connecting the scavenger 74 on one side of the wall member 52 to the scavenger 92 on the other side thereof at a point below the pivotal points of the two, whereby the two scavenger plates 74 and 92 are drawn tightly against the wall member 52 so that the brackets, such as 88, seat in the recesses, such as 86. A coin inserted in the slot 70 follows the dotted coin track 84 until it strikes a combined anvil and testing magnet 94 where, if it lacks a predetermined resiliency or if it possesses magnetic properties, its speed will be sufficiently retarded to cause it to follow a dotted line 96 which identifies a return coin track formed between the wall member 52 and a plate 98 attached to the casting 50 at points, such as 100. This plate 98 with a corresponding plate 102, see Figure 2, forms with the projection 104, see Figures 7 and 2, a coin return cup which will register with the opening 24, see Figure 1, when the door 14 of the cabinet is closed.

If, however, the coin possesses the requisite resiliency, and is non-magnetic it will have sufficient momentum to pass over the gap indicated by the numeral 96, formed by the return coin track and the wall projection 106 with the result that the coin will lodge in a holding member 108, see Figure 4. This holding member 108 forms one end of a scale 110 pivoted at 112 and having a weight 114 in threaded engagement with a stud 116, see Figure 5, and held in a set position by the spring member 118. When an acceptable coin, such as a genuine penny, reaches the coin holding member 108, the weight 114 is overcome and the scale swings downwardly to position 120, and referring to Figure 7, the penny drops out of the holding member and descends along the dotted line 122 where it leaves the coin mechanism and drops into a portion of the driving mechanism, identified in Figure 4 by the numeral 124. A coin in operable position within this part of the coin delivery mechanism is indicated by the numeral 126. The driving mechanism will be described hereafter.

Continuing to refer to Figure 4, during the time required by the holding member 108 on the scale 110 to drop into position 120, a scavenger 128 has dropped into the dotted position 130 where it will cause any coin descending the coin track 84, see Figure 7, during this interval to follow the return coin track 96 to the return coin cup generally identified by the numeral 26.

If the coin descending the track 84 has sufficient resiliency to reach the holding member 108 of the scale 110 but lacks sufficient weight to overcome the weight 114, it becomes necessary to remove the coin from the holding member 108 if the machine is not to be placed out of service. This is effected by means of the scavenger 132,

see Figure 4, which is pivoted at 134 on the plate 98 and urged upwardly by the spring 136, but held in the position shown in Figure 4 by means of the bracket 138 engaging an associated bracket on the L-shaped lever 140 which is pivoted at 142 and to which is affixed the external control 22. This lever 140 is held in normal position by the strong spring 144 which is anchored to the bracket 78, see Figure 4 of the casting 50 at 146 and to the lever arm 140 at 148, see Figure 4. If a customer has dropped a coin of a nature which will reach the holding member 108 of the scale 110 but which will not cause the scale to assume position 120, the customer not knowing this will press down on the external control 22, whereupon the lever arm 140 will descend so as to permit the scavenger 132 to move upwardly under the impulse of the spring 136 into the dotted position 150 where it will cause the coin to be thrown back over the partition 106, see Figure 7, whereupon the unacceptable coin or token will descend the return coin track 96 to the return coin cup 26.

The coin mechanism on the opposite side of the wall member 52 of the casting 50 is identical with that coin mechanism just described, although it will be observed in Figure 2 that for conveniences of construction the lever arm 140, which is joined to the corresponding lever arm 152 so that the two lever arms of the two coin mechanisms are operated as a unit by the external control 22, is held in its normal unactuated position by a single spring 144. A link 82 on the side of the common wall member 42 opposite to the spring 144 carries a slot, not shown, which rides on a stud 154, see Figure 2, affixed to the lever arm 152 in such a way that the stud 154 reaches the lower end of the slot in the link 82 and directs it downwardly to spread the two scavenger plates 74 and 92 when the external control knob 22 has almost finished its stroke. The purpose of this action of the scavenger is to move any slug which has come to rest between the scavenger wall and the bracket 88, see Figure 2, adjacent to the recess 86, from the coin mechanism and this is accomplished, in the case of the scavenger 74, see Figure 2, by moving it outwardly away from the common wall member 52 so that the bracket 88 will push the slug over the edge of the anvil and magnet 94 and permit it to drop downwardly to follow the return coin track 96. It will be observed in Figure 2 that the plate 98 is flared outwardly at 156 to permit this movement of the scavenger plate 74 and to make certain that the slug drops downwardly along the return coin track 96.

It will be appreciated that the benefits obtained by the use of a central casting 50 to form a wall of one or more coin mechanisms is in no way dependent upon the employment of two like coin mechanisms. While it is simpler to provide appropriate connections between the external control, such as 22, and the driving mechanism on the one hand with like coin mechanisms on the other, this could be worked out without difficulty for vending machines calling for a penny coin mechanism on the one side and a nickel or dime coin mechanism on the other.

The storage bins and dispensing mechanisms

As may be seen in Figure 2, this vending machine has two cylindrical storage bins 160 and 162 which are supported by the two cylindrical housings 60 and 62. The magazines 160 and 162 are held in spaced relationship at their upper portions by a plate 164 having its forward and

rearward edges 166 and 168, see Figure 3, curved upwardly to assist in preventing nuts, salt and the like from falling upon the mechanism during the filling of the magazines. Each magazine is provided with a lid 170 and 172.

Referring to Figure 9, the cylindrical housing 60 is a die casting of circular cross section having an inward shoulder 174 upon which rests the bottom of the cylindrical magazine 162 and projections 176 and 178, whereby the housing 60 may be assembled with the projecting portion 54 of the casting, see Figure 7, by means of holes such as 180 and 184. Bayonet slots 186, 188 and 190 and the locking spring member 192, see Figure 9, serve to receive properly spaced lugs, such as 194 and 196, see Figures 2 and 6, which are rigidly secured to the lower wall of the magazine 162 and function in the conventional manner.

In order to permit descent of the bulk material such as peanuts from the housing 60, a hole which is shown in dotted outline in Figure 6 and is identified by the numeral 198 is provided.

Centrally of the bottom of the cylindrical housing 60 is journaled a shaft 200, see Figure 3, passing through a reinforcing shoulder 202 formed in the casting of the housing. A beveled gear 204 is disposed on the lower end of the shaft 200 beneath the bottom of the housing and a cross pin 206 passed through a hole in the shaft within the housing performs the two functions of maintaining the shaft in position and of driving a portioning wheel 208 which is shown in Figures 10 and 14.

Cast into the bottom of the housing 60 is the shoulder 210 through which is drilled a threaded hole to receive the screw 212 and the spring 214. Referring to Figure 8, the delivery chute 64, heretofore identified, consists of a cover plate 216 having means for supporting a hinged weighted door therefrom. In assembled relationship this double delivery chute is supported from the bottoms, referring to Figure 2, of the two cylindrical housings 60 and 62 by means of the screws 212 and 218.

Referring now to Figures 5 and 6, two brackets 220 and 222 depend from the bottom of the cylindrical housing 60, which in Figure 5 is viewed from the rear. These brackets support a shaft 224 which carries on the outer end a beveled gear 226 in mesh with the beveled gear 204. It will be understood, therefore, that the power for operating the portioning wheel, such as 208, within the cylindrical housing 60 is derived from the shaft 224 acting through the beveled gears 226 and 204.

The portioning wheel is shown in Figures 10 and 14 and comprises a die casting divided into four compartments 228 by double wall members 230 and 232, there being an upper rim 234 extending around the portioning wheel for the joint purpose of providing strength and a seating surface for a baffle 236, see Figures 16 and 3, shortly to be described. As viewed in Figure 10 the portioning wheel is designed to move in a counterclockwise direction and inasmuch as the wall 230 and those walls corresponding thereto will be obliged to move bulk material along the floor of the cylindrical housing 60 when the portioning wheel is rotated, this wall is made heavier than the following wall 232. Figure 14 is a bottom view of the portioning wheel showing how the hub ring 238 is cut at 240 and 242 in order to receive the ends of the pin 206 by means of which the shaft 200 imparts rota-

tional movement to the portioning wheel 208, see Figure 3.

For the purpose of properly filling the compartments of the portioning wheel 208 there is provided in the bottom of each magazine a baffle member, generally identified by the numeral 236. This baffle member 236 is shown positioned on the portioning wheel 208 in Figures 3 and 6 and is shown in perspective in Figure 16. Generally speaking, it comprises a circular band 246 and a sloping floor portion 248 which terminates at an edge 258 which is approximately a radius of the circle forming the ring member 246 at which edge it drops off abruptly to form the surface 250. The surface 250 is cut away to receive a plurality of helixes 256. A sloping surface 260 forms another portion of the baffle member 236 but it slopes at a greater angle than the surface 248. A secondary baffle 262 forms the lower portion of this sloping surface 260, for a purpose hereinafter explained.

The baffle member 236 is positioned in a magazine by resting a downwardly turned groove 265, see Figures 16 and 3, into a circular channel formed in the upper circumference of the portioning wheel 208 by a raised edge 267 of the ring 234, see Figure 3. In order to prevent the baffle member 236 turning with the portioning wheel upon actuation thereof, a lug 239, which may be seen in dotted outline in Figure 16, is disposed in the outer wall of the circular band 246. The lug may be dropped into the slot 186 of the housing 60, see Figure 9, or the slot 272 of the housing 62, see Figure 2. Continuing to refer to Figure 2, the slot 272 is a downward extension of one of the slots which holds a magazine in assembly with the housing 62. In the case of the housing 62, the deep slot 272 is positioned on the forward side thereof, whereas the deep slot is positioned adjacent the coin mechanism in the housing 60, see Figure 9, because it is desirable that a single baffle member 236 be usable interchangeably for either of the magazines. Referring to Figure 6, inasmuch as the holes in the bottom of the housings 60 and 62 are adjacent to each other, the baffle members 236 are positioned in opposed relationship to each other so that their delivery edges will occupy the positions indicated by the dotted line 244 in the housing 60 and fully shown in the housing 62, see Figure 6.

The baffle member 236 has two functions in addition to that of preventing flow of bulk material through the opening in the bottom of the housings. It must skim off the bulk material from the top of each compartment as it passes beneath the baffle in order to prevent a compartment having bulk material heaped thereabove from passing into delivery position, and secondly, it must avoid jamming of bulk material at critical points. In order to prevent any heaping of the bulk material in a compartment as it moves toward delivery position, the baffle member 236 having a downwardly directed wall portion 250, see Figure 16, is positioned immediately above the portioning wheel 208, see Figure 3, whereby the lower edge of the wall 250 is flush with the plane of the upper edge of the portioning wheel 208. By this arrangement the baffle member will permit only bulk material lying entirely below the upper edge of the compartments of the portioning wheel to advance to the delivery orifice.

Jamming may occur between the lower edge of the baffle and an advancing partitioning wall of

the compartments of the portioning wheel 208 and this jamming might interfere with the proper functioning of the machine. To avoid this, a substantial portion of the wall 250 is cut away and a yielding wall which in this embodiment are helixes 256 is inserted. These helixes will yield with pressure to permit the passage of wedged bulk material, but they will spring back into normal position so as to continue to perform their function of skimming off the bulk material from the top of the compartments.

It will be appreciated that the resilient wall is always positioned with reference to the portioning wheel so that the portioning wheel advances against and not away from it. This relative positioning is assured by the action of the lug 239 and the elongated slots 272 and 186, heretofore mentioned.

A feature of this invention is the provision of secondary baffles for the purpose of preventing a customer jumping nuts in a compartment of the portioning wheel which has passed underneath the wall of helixes 256 over the edge of the compartment and out the delivery orifice. The size of the compartments of the portioning wheel with relation to the baffle is such that in order to get a compartment completely under the outlet orifice so as to assure full delivery of the contents of the compartment, a portion of the next following compartment passes underneath the wall of helixes. Under such circumstances, a customer could by jolting the machine cause bulk material in a loaded compartment to jump over the partition into the delivery orifice. Moreover, if it were possible to pick up the machine, a customer might by rocking it completely empty a magazine. In order to avoid this possibility, two secondary baffles, which are indicated in dotted outline by the numerals 275 and 277, are provided, see Figures 16 and 6.

These baffles extend downwardly and terminate at the plane of the bottom of the baffle member 236 which is approximately the plane of the top of the portioning wheel when the two are assembled together. These two secondary baffles, 275 and 277, are at approximately right angles to each other, and, referring to Figure 10 register with any two adjacent partitioning walls of the compartment. The secondary baffle 275 will prevent any bulk material in a compartment which has partially passed beneath the wall of helixes 256, which is the condition of the portioning wheel just before a normal cycle of the machine commences, from passing over into the delivery orifice.

The same is true of the secondary baffle 277. The compartment of the portioning wheel at that side of the baffle member 236 has partially passed beneath the flexible secondary baffle 262 so that the bulk material is dropping into this compartment. Were it not for the secondary baffle 277 it would be possible to cause bulk material to pass over the rear wall of the compartment into the delivery orifice. The secondary baffle 277 prevents this.

The secondary baffle 262 may be bent upwardly so as to permit the passage of nuts thereunder, under that comparatively rare circumstance where the portioning wheel has been backed up a little bit and nuts have accumulated beneath this secondary baffle 262.

The foregoing sets forth the means for storing the bulk material and for dispensing it in response to the driving mechanism, now to be described.

The driving mechanism

As indicated heretofore in this selective vending machine, a single external control 22 is used for the purpose of actuating the dispensing mechanism associated with either magazine while the customer selects the magazine to be actuated by depositing his coin in one or the other of two coin mechanisms. It is evident, therefore, that a machine of this type must provide means for coupling the single external control to either one of the dispensing means. Broadly speaking, the means for effecting this coupling of the external control to one of the dispensing means is the penny itself dropped in one of the coin slots. The means for enabling the penny to perform this function will now be described.

Referring to Figure 4, the lever arm 140 has a projecting portion 280 over which is hooked a link 282 which slides in the channel member 284. The link 282 has therein an elongated slot 286 along which a capped stud 288 fastened to the channel member 284 may ride. The function of this telescoping arrangement of the channel member 284 and the link 282 in conjunction with the function of a spring 290 will be described hereafter. For present purposes it is sufficient to say that under normal operation of the machine, downward movement of the lever arm 140 will cause downward movement of the channel member 284 and upward movement of the lever arm 140 will cause upward movement of the channel member 284.

The channel member 284 is pivotally coupled to an arm 292 at 294, and referring now to Figure 11, the arm 292 is seen to be a circumferential projection on a driving disk 296 having a smooth rim facing 298, a hub 300, a series of teeth 302, a semi-circular raised portion 304 and a lug 306. This driving disk 296 is centrally positioned as may be seen in Figures 5 and 6 beneath the wall member 52 of the casting 50 and is held in position by means of the two shafts 224 and 308, shown in Figure 6 in dotted axial alignment. As heretofore described, the shaft 224 is mounted beneath the cylindrical housing 60 and the shaft 308 is mounted beneath the cylindrical housing 62. In assembling, the shaft 224 on the housing 60 is secured to the casting 50. The driving disk 296 is slipped over the shaft 224 and the shaft 308 and housing 62 are next positioned. The driven disk 310, therefore, is journaled upon the abutting ends of the stub shafts 224 and 308.

On the inner end of each of these shafts 224 and 308 is a driven disk as 310; both sides of which may be seen in Figures 15 and 11. The inner wall of the disk 310 has an annular channel 312 for seating the hub 300 of the driving disk 296, see Figure 15. Additionally, it has an annular recess 314, the outer edge of which 316 will just clear the outer edge of the projection 306 on the driving disk 296, see Figure 11, and the inner edge of which will clear the raised semi-circular portion 304 of the driving disk 296. Projecting inwardly from the rim of the disk 310 are four projections, as 318 and 320, see Figures 11 and 15, while immediately behind each of these projections in the circumferential edge of the disk are notches as 322 and 324. Referring to Figure 13, a disk 326 similar to the disk 310 is mounted on the inner end of the shaft 308.

When the driving disk 296 is in assembled relationship with the driven disk 326, the distance between the face, see Figure 11, of the driving disk 296 at the positions of pennies 328 and 329

and the inside face of the driven disk 310 is slightly in excess of the thickness of a penny. Moreover, the outside diameter of the driven disk 310 exceeds that of the outside diameter of the driving disk 296 by a distance sufficient to permit the projections such as 318 to move without interfering with any part of the driving disk, including the driving arm 292. The distance, referring now to Figure 12, between the outer edge of the hub 300 on the driving disk 296 and a projection such as 318 on the driven disk 326 is less than the diameter of a penny which is shown in position 328. Assuming that no penny is in the assembly, referring to Figure 13, the driving disk 296 may be moved freely without imparting any movement to either of the driven disks 310 or 326. On the other hand, with a penny in the position 329, see Figure 11, a counter-clockwise motion of the driving disk 296 will cause the lug 306 on the driving disk 296 to engage the penny and advance it counter-clockwise. In due course, the penny will advance past the notch 324 and engage the projection 319. When this occurs, the driven disk 326 is turned counter-clockwise, which movement is imparted to the shaft 308 and actuates the dispensing mechanism in the housing 62, see Figure 5.

In order to prevent rotation of the shafts 224 and 308 when they are not coupled by a coin to the driving disk 296, a detent 332, see Figure 4, is provided for cooperative action with the notches 322 which are ninety degrees apart in the circumferences of the two driven disks. The detent 332 is pivoted at 334 to the plate 98 and is limited to vertical movement only by an offset member 336 stamped from the plate 98. The detent 332 has a projection 338 disposed to slide along the surface of the driven disk 310. A spring 340 urges the detent against the surface of the driving and driven disk. This detent 332 is shown in position in Figure 4 where it engages the notch 322. This is normal position, i. e., the position at the beginning of a cycle of the machine, and when in this position, a coin may drop between the driving and driven disks because the detent is out of vertical alignment of the coin track.

By referring to Figure 5, it will be observed that two detents are provided, one for each driven disk. A single detent would not suffice, for the disengagement of the detent by a coin in one side of the driving assembly would release the other driven disk which would be free to rotate as by joggling and thereby discharge bulk material from the other bin.

The movement of the coin to perform its function is now fairly apparent. When a customer inserts a coin in the slot 18, see Figure 1, it descends the coin track indicated by the numbers 84 and 122 in Figure 7 and enters the opening and assumes the position indicated by 329 between the driving disk 296 and the driven disk 310, shown in Figures 11 and 13. The customer now advances the external control 22, see Figure 4, downwardly which through the lever arm 140, the link 282, the channel member 284 and the arm 292 causes a counter-clockwise movement of the driving disk 296, see Figures 4 and 12. Referring to Figure 12, the lug 306 moves the coin in a counter-clockwise direction, and referring to Figure 4, the coin cams the detent 332 out of the notch 322 so that it may ride along the flaring rim portion of the driven member 310. As the driven member 310 rotates, the detent 332 is cammed outwardly, referring to

Figure 12, so as to clear the following projection 318. Returning to Figure 12, as the coin continues its counter-clockwise movement, it encounters the projection 319 on the far side of the driven disk 310 and drives the driven disk 310 in a counter-clockwise direction. This movement causes actuation of the delivery mechanism whereby the portioning wheel is rotated ninety degrees and a filled compartment thereof passes over the delivery orifice so that the bulk material therein drops into chute 30 where it is held by a weighted door 370 until removed by the customer.

The length of the stroke of the driving disk 296 is somewhat in excess of ninety degrees and at the end of the stroke the detent 332, which has been sliding along the surface of the driven disk 310 drops into the next notch on the surface of the driven disk 310. At this point the coin is in the dotted position indicated in Figure 4 by the numeral 344 and is able to drop into a coin till 346 mounted therebelow. The customer now releases the external control 22 which is drawn upwardly by action of the spring 144 and in so doing, referring to Figure 12, the semi-circular raised portion 304 encounters the coin and pushes it outwardly so that it falls into the coin till 346. The driven disk 310 having been advanced ninety degrees, an opening similar to 329 is again presented to the bottom of the coin chute in the coin mechanism and the machine is ready to repeat its delivery cycle.

Three protective features incorporated into the driving mechanism of this vending machine have yet to be described. The first relates to a full stroke pawl. In manually operable bulk vending machines it is necessary to provide means for compelling a customer to actuate an external control to a point such that the external control will complete the cycle of the dispensing operation and return to normal position. Otherwise, the machine may be left in partially actuated position so that it is inoperative. In order to compel a customer to cause the external control to go through a full stroke, it is frequently the practice to provide what is called a full stroke pawl which compels a customer to fully actuate the external control before any merchandise is delivered. This pawl is novelly positioned in applicant's invention.

Referring to Figure 11, it will be recalled that on the driving disk 296 there is a series of teeth 302, and referring to Figure 4, a pawl 350 pivoted on the pin 352 supported by a U-shaped bracket 354 is mounted on the plate 98. This U-shaped bracket is urged in a counter-clockwise direction by the spring 340 with the result that the pawl 350 is pressed against the projection 318. When a penny reaches position 328 and the external control 22 is actuated, the projection 318 is advanced forwardly until it no longer supports the pawl 350 which under impulse of the spring 340 drops downwardly on the teeth 302 which are also moving forwardly. The pawl engages the teeth 302 and prevents a backward movement of the driving disk 296 or the driven disk 310 with the result that the external control 22 will not return to normal until it has moved downwardly sufficiently far to advance the next projection 320 on the driven disk 310 which cams the pawl 350 out of engagement with the teeth 302. This occurs at the time that the detent 332 has dropped into the next notch with the result that the freeing of the driving disk 296 for a return or reverse movement in response to

an upward movement of the external control 22 does not cause a like reversal of movement in the driven disk 310 for the detent 332 is holding the driven disk 310. As may be seen in Figures 5 and 6, there are two full stroke pawls, one for controlling each dispensing mechanism.

The second protective feature relates to the employment of the spring 290, see Figure 4, in conjunction with the telescoping arrangement of the link 282 and the channel member 284. It will be recalled that the full stroke pawl 350 will hold the entire driving mechanism in partially actuated position until a full stroke is completed. It follows that if a link of fixed length connected the lever arm 140 to the arm 292, it would be impossible for a customer to raise the external control 22 to normal position without breaking some connecting part. Unfortunately, vending machines are subjected to considerable abuse, due not only to malice but to impatience. Some customers who partially actuate an external control 22 and find it held in partially actuated position without dispensing merchandise by an unseen pawl, would force the lever upwards and damage the machine. For this reason it is desirable to permit a customer to raise the external control 22 toward normal position even though the driving mechanism commencing with the channel member 284 and the arm 292 are held in fixed position by the full stroke pawl 350. To effect this the spring 290 is anchored between the lever arm 140 and the channel member 284 and they are held in yieldable relationship subject to the limits of the slot 286 in the link 282. Normally, the channel member 284 and the lever arm 140 bear the relationship shown in Figure 4 throughout the entire stroke of the external control, but if the external control is stopped at some point short of a full stroke so that the pawl 350 holds the external control as well as the entire driving train in partially actuated position, it is possible to raise the external control by expanding the spring 290.

The third protective feature of this driving mechanism is provided for the purpose of preventing the spinning of a dispensing mechanism by rapid actuation of the external control 22. Referring to Figure 11, the outer face of the driven disk 310 possesses four radiating wales, as 400. Each wale is at approximately right angles to adjacent wales. On the channel member 284 is positioned a triangularly shaped blocking member 402. The member 283 and the blocking member 401 correspond respectively to the member 284 and the blocking member 402 except that they are on opposite sides of the driving mechanism. The angle α of the projection 402, identified in Figure 11, is an obtuse angle, but the exact configuration of the projection 402 is important only insofar as its two sides forming the angle α must engage two adjacent wales. In the event a penny reaches the position 329, as shown in Figure 11, the counterclockwise movement of the driving disk 296 imparts a similar movement to the driven disk 310 with the result that the blocking member 402 passes between two of the wales 400. By so doing, the driven disk 310 can not advance any more rapidly than the driving disk 296 because the latter is positively coupled to the driving channel member 284 which through the blocking member 402 controls the driven disk 310. Similarly, the driven disk 310 can not be reversed or backed up when the driving mechanism is in partly actuated position.

The empty lock

The empty lock shown in the drawings is the invention of only one of the co-inventors in this application and is the subject, therefore, of a separate application, bearing Serial No. 329,436, filed April 13, 1940. For the purpose of this application it is sufficient to say that, referring to Figure 3, the testing finger 66, which is pivoted at a point just outside of the magazine 162, is adapted to engage by means of an extending lever arm 360 the counterweight 114 on the scale 110, see Figure 4. If there is an absence of merchandise in the magazine 162 at the point where the testing finger 66 is positioned, the testing finger will drop so as to raise the counterweight 114, which in turn lowers the holding member 108. The scavenger 128 drops into dotted position 129 and prevents the vending machine from accepting coins.

Summary of operation of the machine

This vending machine is built around the casting 50 which can be mounted in or removed from the cabinet 10 by the simple method of opening the door of the cabinet and dropping the studs 44 and 46 of the casting 50 with the entire operable mechanism thereon into the holes 40 and 42 of the brackets 36 and 38 supported on the rear wall of the cabinet. For ordinary servicing purposes the coin till 346 is readily assembled and the top of the cabinet may be opened upwardly to permit pouring of bulk material, such as peanuts into the magazines.

With the mechanism in position and the magazines filled, a customer by inspecting the contents of two front panels 362 and 364 may make a selection between the two coin slots 16 and 18, see Figure 1. If he selects the coin slot 18 and deposits a coin, referring to Figure 7, the coin will pass down the coin track 84 where it will lodge, see Figure 4, in the holding element 108 of the scale 110. If the coin is acceptable it will overcome the counterweight 114 and after leaving the holding member 108, it will continue its course downwardly along the dotted coin track 122 until it reaches position 329 in the left hand or forward coin slot shown in Figure 11.

The customer will now move the external control lever 22 downwardly and in so doing, referring to Figure 4, will impart a counter-clockwise movement to the driving disk 296 which, through the penny, rotates the shaft 224, see Figure 5, in the same direction as that of the driving disk 296. By means of the beveled gears 204 and 226 this rotational movement of the shaft 224 is communicated to the shaft 200, see Figure 3, and by means of the pin 206 to the portioning wheel 208. Inasmuch as each full stroke of the external control 22 rotates the driving disk 296 through an arc of ninety degrees and inasmuch as the shaft 200 rotates through the same arc, it is apparent that on each full actuation of the external control 22 the portioning wheel 208 will be rotated by ninety degrees. The portioning wheel has four compartments and it follows that on each actuation of the external control, one compartment will be brought over the aperture 198, see Figure 6, whereby the contents of the particular compartment will drop, see Figure 8, into the right hand opening of the dispensing chute 64 and will be stopped by the heavily weighted door 370, see Figure 2. This door 370 is pivoted at its top and has sufficient weight to hold back the bulk material in the chute above

it. All the patron need do is to lift the door to release the bulk material.

The machine is so designed that it will not completely empty a compartment until the external control 22 has been fully actuated and the full stroke pawl 350 has been cammed out of operative position with respect to the driving disk 296.

It will, of course, be appreciated that many changes may be made in the apparatus described without departing from the spirit of the invention. For example, the use of studs on a central casting which supports the entire delivery mechanism is not limited to any particularly positioned studs. The stud receiving means might be mounted in the side of the cabinet and yet permit the insertion and withdrawal of the vending mechanism through the front door of the cabinet with ease. Similarly, the provision of driving and driven disks for cooperative action by means of a coin need not necessarily be positioned beneath adjoining coin mechanisms. The driving and driven disk positioned adjacent to one another and receiving a coin would fall within the spirit of this invention even though it were some distance away from another driving and driven disk. Similarly, numerous other equivalents could be devised without departing from the spirit of this invention.

Having thus described the invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. A driving assembly for coin operated vending machines comprising, a driving disk having teeth in its rim, driven disks in axial alignment on each side of said driving disk, a single external control operative to rotate said driving disk, means to couple said driving disk with said driven disk by means of a coin, full stroke pawls, one for each driven disk, disposed to engage said teeth, and lugs on the periphery of said driven disks and extending over a limited portion of the driving disk for holding the full stroke pawls out of engagement with said teeth when the driven disks have made a full operative movement, but releasing the associated full stroke pawl for engaging said teeth as a delivery stroke rotates a driven disk and one of such lugs.

2. In a vending machine comprising a cabinet, a casting within the cabinet having a wall, a single external control on the front of said wall, and a storage bin on each side of said wall, dispensing means at the base of each storage bin mounted on said casting and comprising a portioning wheel of similarly shaped segmental compartments, an aperture in the bottom of said storage bin beneath which said segmental compartments of the portioning wheel may be moved for delivery of bulk materials, a driven disk positively coupled to the portioning wheel and disposed to be coupled to the external control by means of a coin, notches equidistant around the driven disk of the same number and correspondingly positioned thereon to the partitioning walls of the portioning wheel, a detent engaging said notches having a projecting portion so disposed as to cause the detent to be cammed out of engagement with the notch by a coin during a delivery operation, whereby the detent will permit rotation of the portioning wheel sufficient to advance only one compartment beneath the delivering orifice, and a coin chute integrally formed on each side of said wall for delivering acceptable coins to said coupling mechanism.

3. In a vending machine comprising an actuat-

ing mechanism having a driving disk and a driven disk disposed in axial alignment means for delivering acceptable coins between the driving disk and the driven disk, lugs on said driven disk and a lug on said driving disk adapted to be coupled by a coin deposited therebetween to form a driving connection between the driving disk and the driven disk, a link connecting the driving disk to the external control, a blocking member on said link in alignment with the outer face of the 10

driven disk, and wales at approximately right angles to each other on the face of said driven disk so positioned that on an actuating stroke the blocking member will pass between two of such wales and prevent a backward or spinning movement of the driven disk.

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