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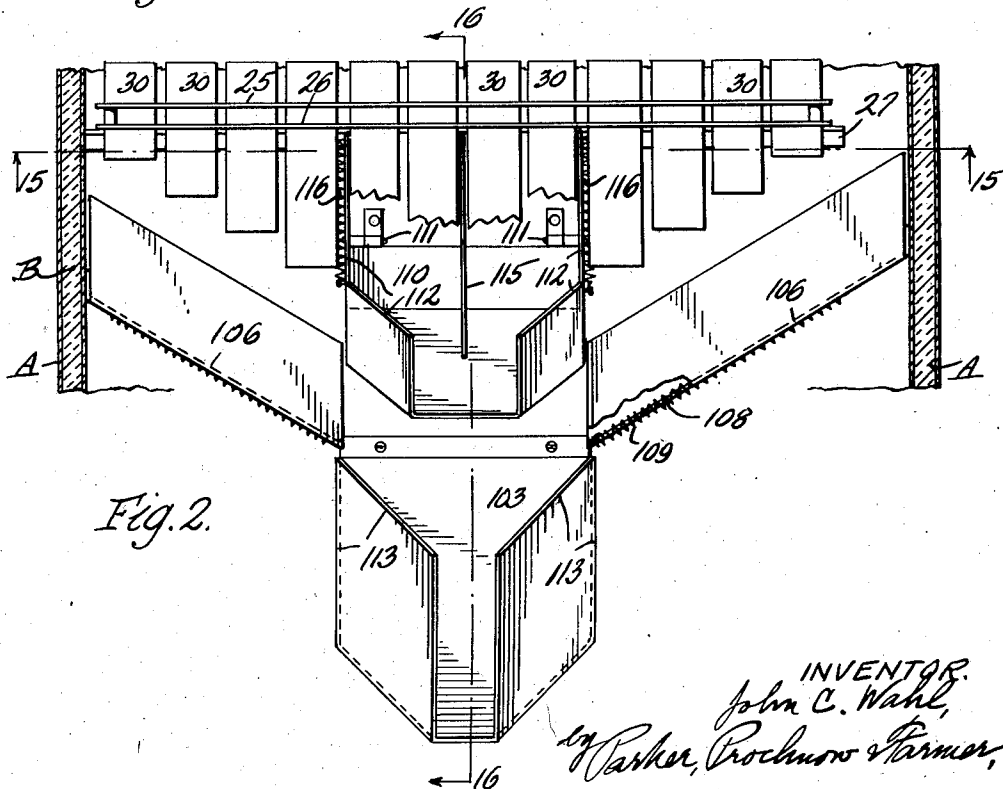
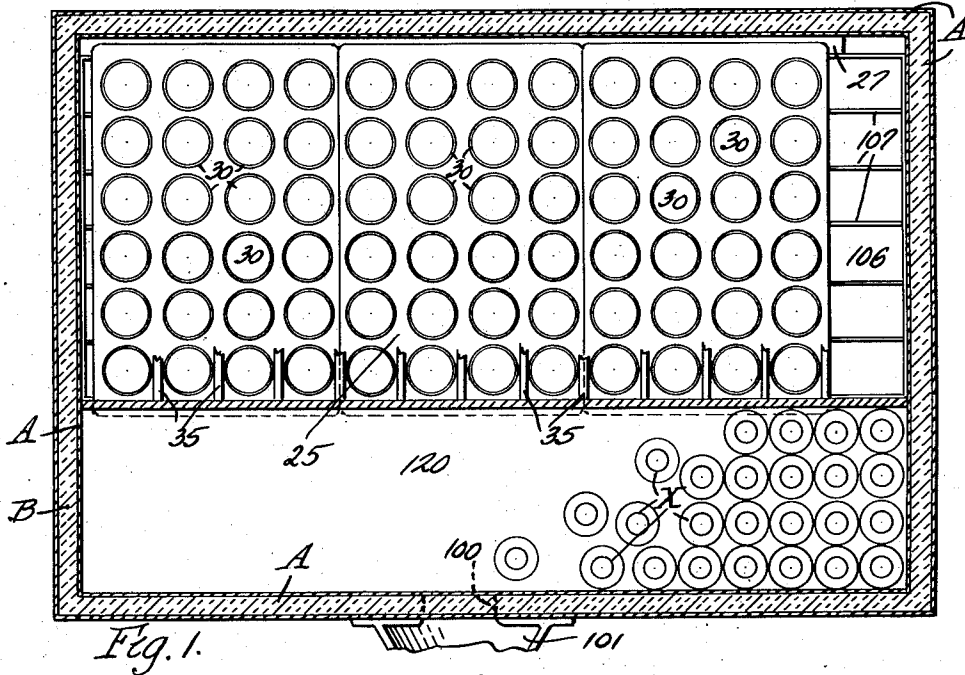
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2,273,479

ARTICLE DISPENSING OR VENDING MACHINE

Filed June 15, 1940

7 Sheets-Sheet 1



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2,273,479

ARTICLE DISPENSING OR VENDING MACHINE

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7 Sheets-Sheet 2

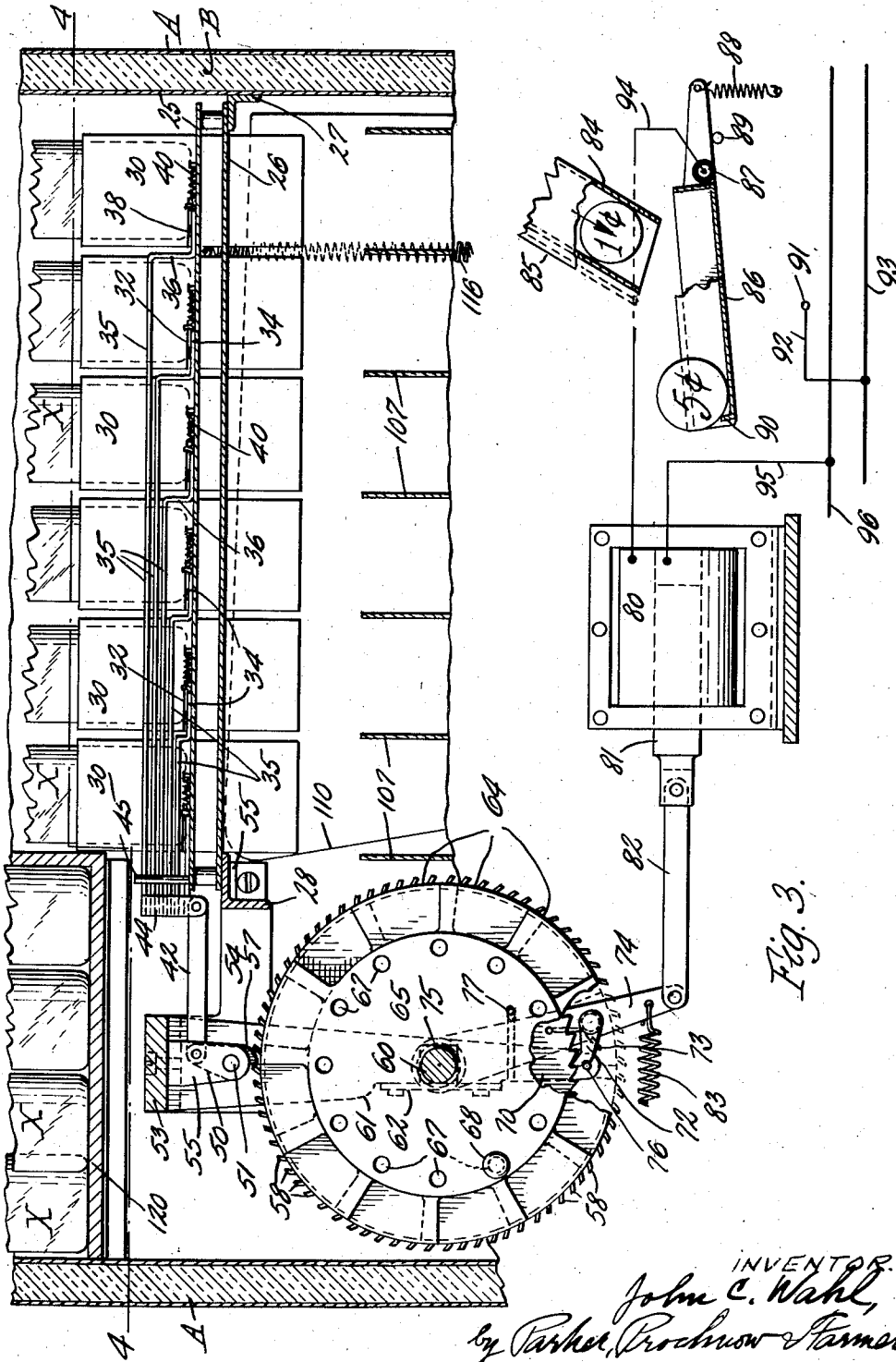


Fig. 3.

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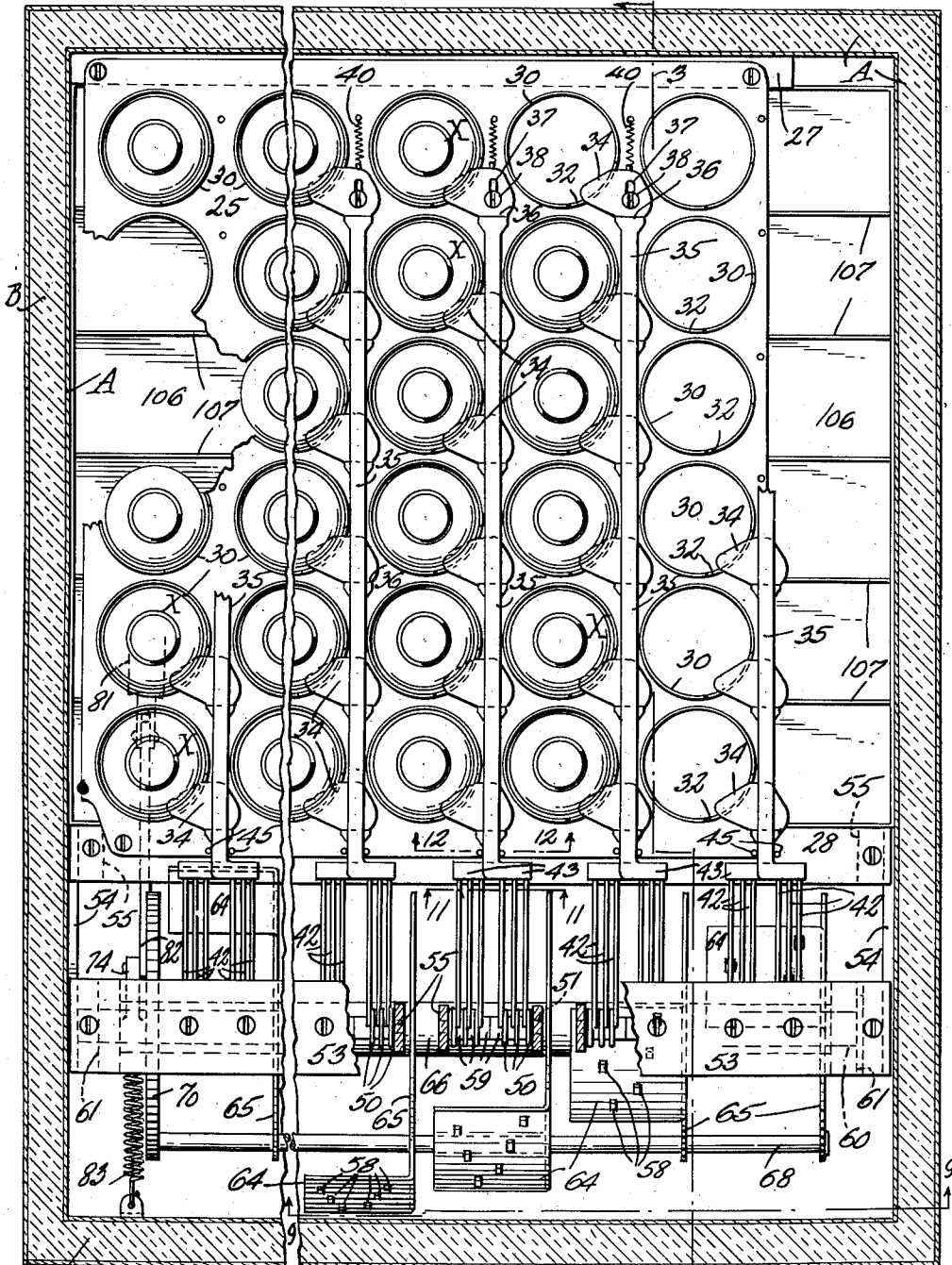
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ARTICLE DISPENSING OR VENDING MACHINE

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7 Sheets-Sheet 3



A Fig. 4.

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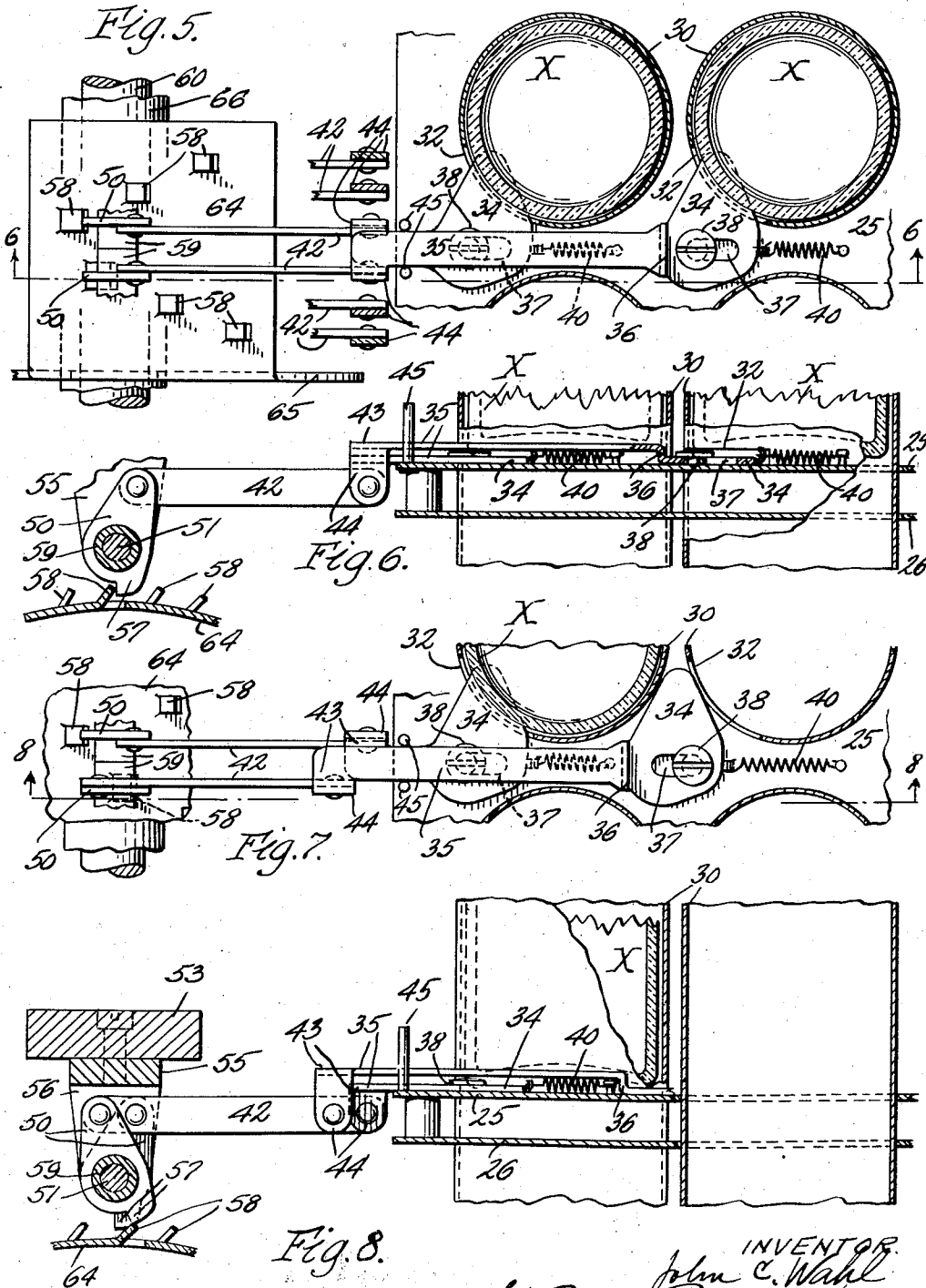
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ARTICLE DISPENSING OR VENDING MACHINE

Filed June 15, 1940

7 Sheets-Sheet 4



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ARTICLE DISPENSING OR VENDING MACHINE

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7 Sheets-Sheet 5

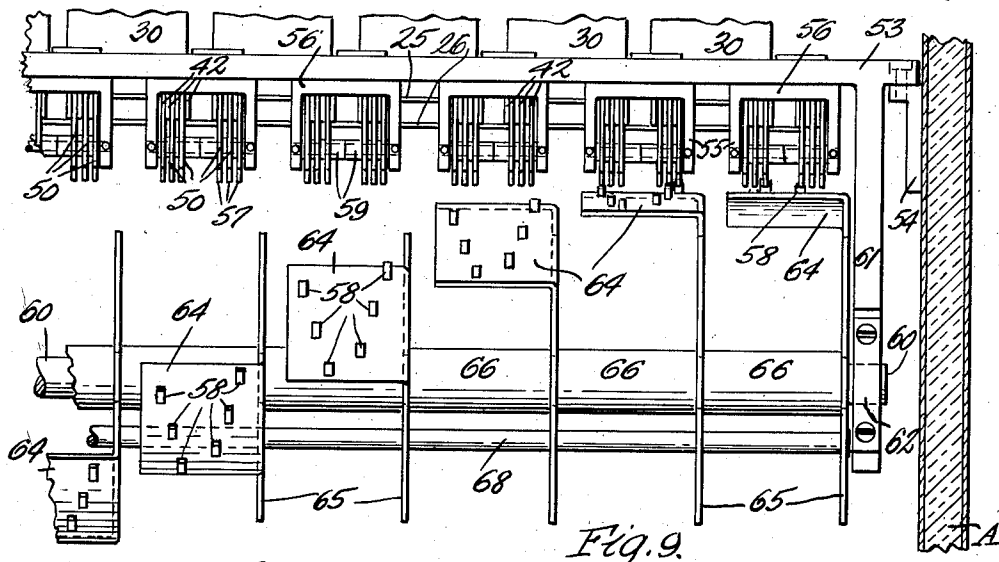


Fig. 9.

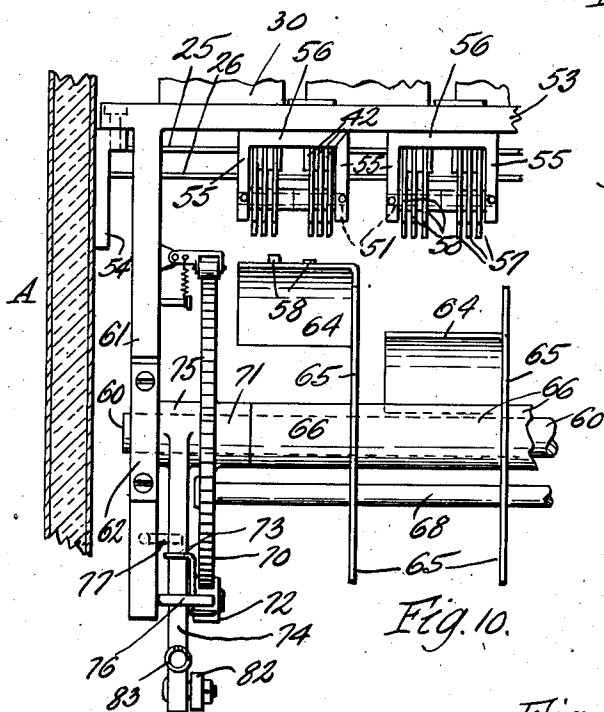


Fig. 10.

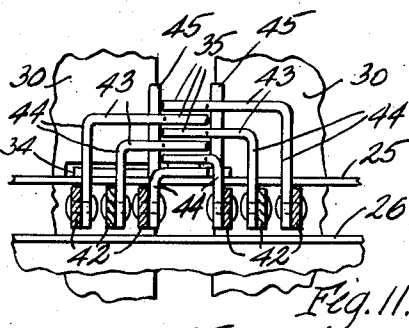


Fig. 11.

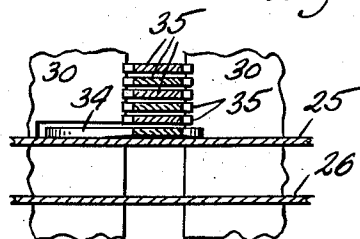


Fig. 12.

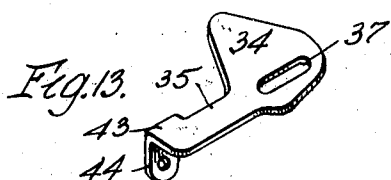


Fig. 13.

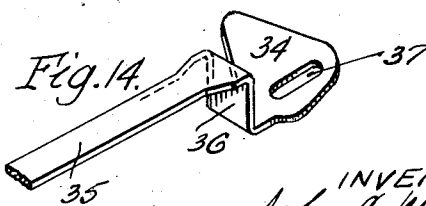


Fig. 14.

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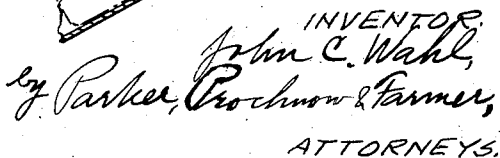
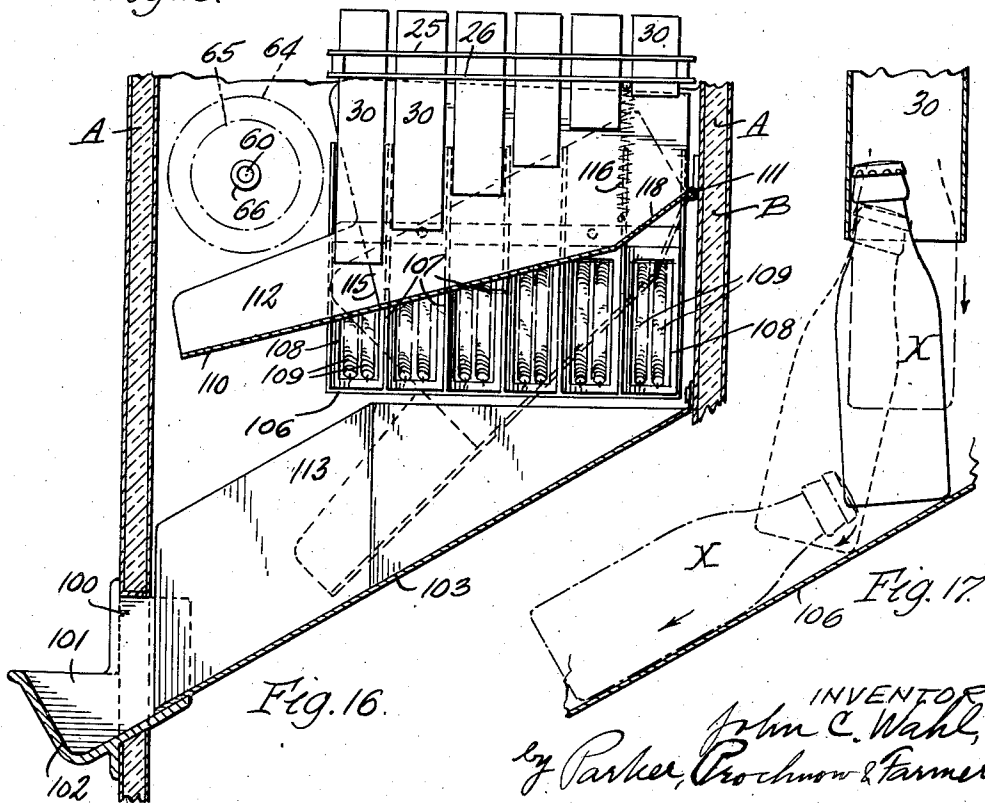
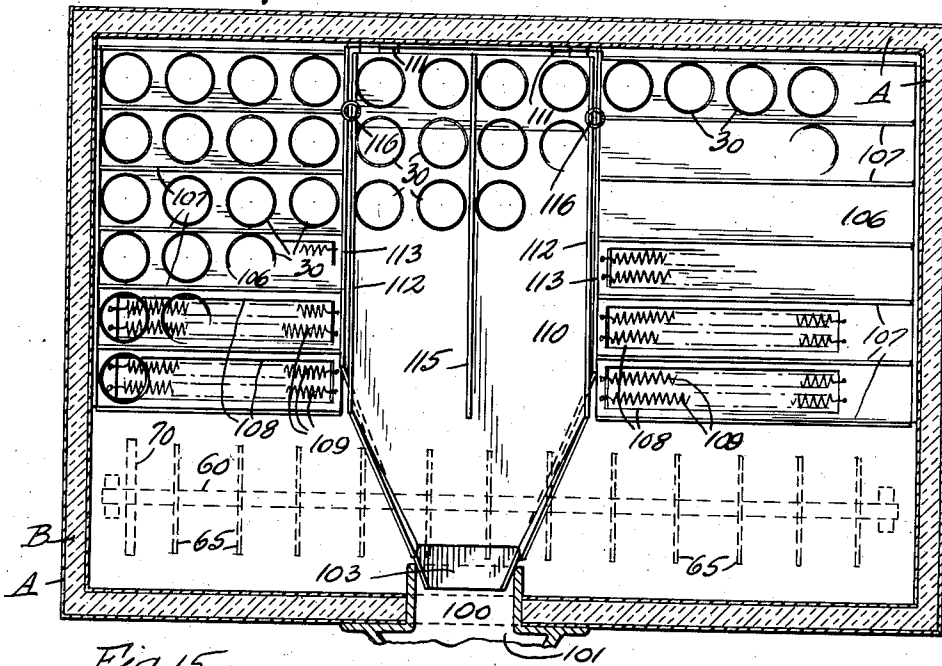
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ARTICLE DISPENSING OR VENDING MACHINE

Filed June 15, 1940

7 Sheets-Sheet 6



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ARTICLE DISPENSING OR VENDING MACHINE

Filed June 15, 1940

7 Sheets-Sheet 7

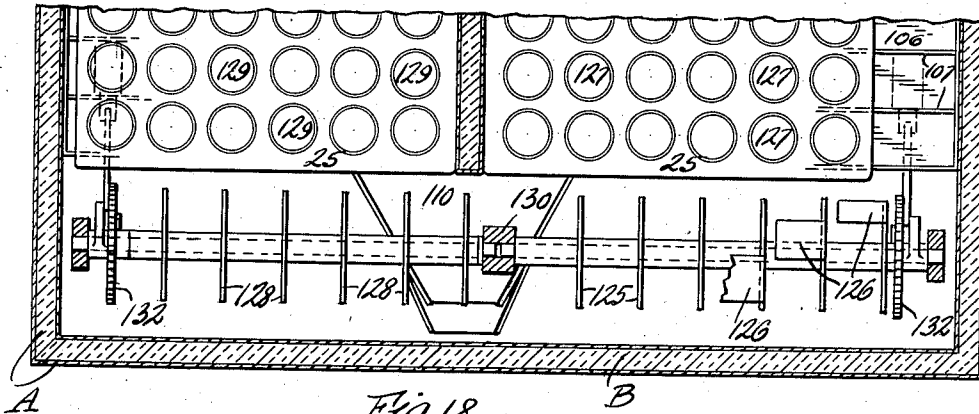


Fig. 18.

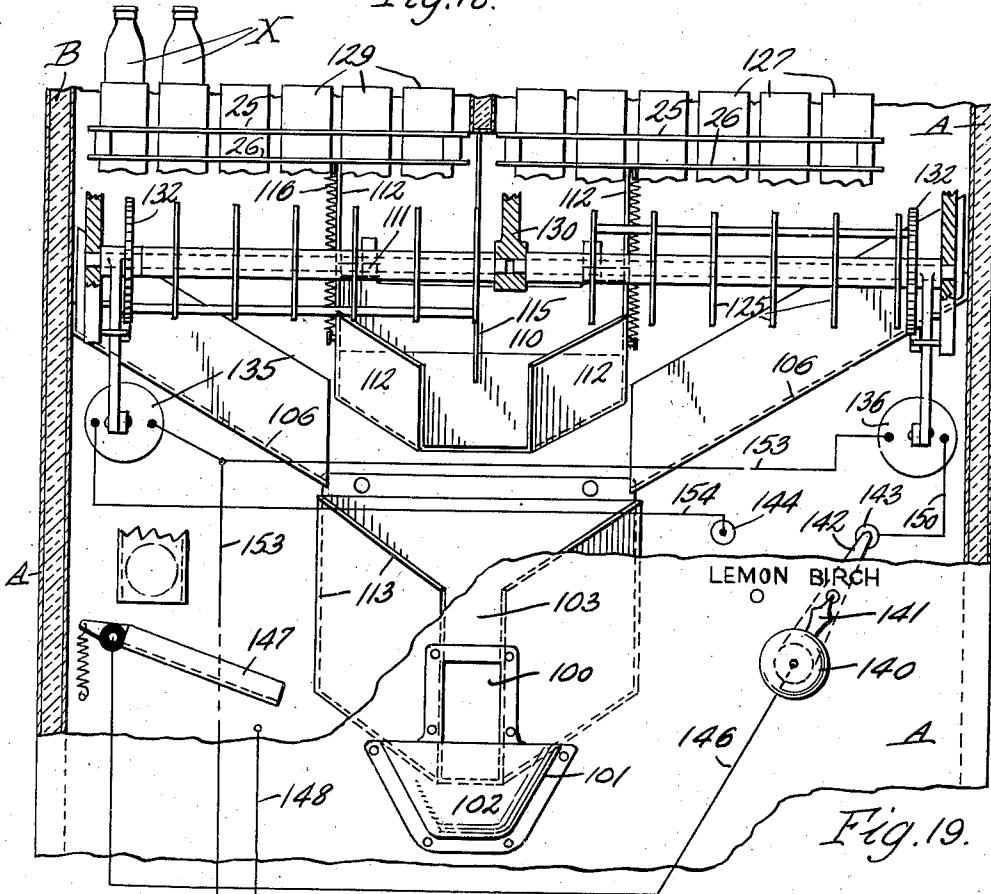


Fig. 19.

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UNITED STATES PATENT OFFICE

2,273,479

ARTICLE DISPENSING OR VENDING
MACHINE

John C. Wahl, Buffalo, N. Y.

Application June 15, 1940, Serial No. 340,747

18 Claims. (Cl. 312—88)

This invention relates to improvements in article dispensing or vending machines.

The invention is shown in the accompanying drawings as applied to a machine for dispensing or vending beverages in bottles, but it will be understood that it is not intended to limit the invention to use on bottles, since packages or articles of other types may be dispensed or sold by means of the machine embodying this invention.

One of the objects of this invention is to provide an improved apparatus for dispensing articles, one at a time from a stationary magazine containing the same, by means of which a large quantity of articles may be handled by means of a comparatively simple and easily operable mechanism. Another object is to provide a machine of this kind with an improved article releasing mechanism which, immediately upon release of an article, is automatically reset for receiving another article. A further object of the invention is to provide an article dispensing machine of large capacity in which each of the articles is held in its own receptacle until released, in which the receptacles are arranged in groups, and in which the releasing mechanism for each group is a duplicate of the releasing mechanism for another group, to facilitate the manufacture of my improved machine.

Another object of this invention is to provide an easily operable mechanism of improved construction for releasing articles one at a time for discharge from the machine. A further object is to provide an improved mechanism of this kind which is so constructed that it can be actuated through the medium of a solenoid. Another object is to provide an improved and simplified releasing mechanism of this type capable of operating upon a large number of articles to release them one at a time. Another object is to provide a mechanism of this kind which is operable to dispense articles of different kinds selectively according to the choice of the purchaser.

Another object of this invention is to provide guide passages of improved construction, by means of which articles from different parts of the apparatus are discharged by gravity to a common discharge outlet. A further object of the invention is to provide an arrangement of guide passages for the articles in which the articles will be discharged without inverting the same. Another object is to provide guide passages of this kind of improved construction for providing a gradual drop of the articles to the discharge of the machine. It is also an object

of this invention to provide guide passages which are particularly suited for use in dispensing bottles so that the bottles will be discharged bottom first through the inclined chutes, and in which all of the bottles will be delivered to the discharge of the machine without attaining excessive speed during their descent to the discharge opening of the machine. A further object is to provide an apparatus of this kind in which the bottles are supported in upright positions in stationary compartments before dispensing the same.

Another object of this invention is to provide a dispensing machine of improved construction in which the articles to be sold are arranged in a novel manner to facilitate the successive releasing of the articles and the delivery of the same from the machine without excessive drop on the part of any of the articles, regardless of where they are located with reference to the discharge of the machine.

Other objects of this invention will appear from the following description and claims.

In the accompanying drawings:

Fig. 1 is a sectional plan view of an article dispensing machine embodying this invention, showing the general arrangement of the individual article compartments and the precooling space.

Fig. 2 is a fragmentary transverse sectional elevation thereof, showing the relative disposition of the means for guiding the bottles to the discharge opening.

Fig. 3 is a fragmentary longitudinal sectional elevation thereof on a larger scale, taken approximately on the line 3—3, Fig. 4.

Fig. 4 is a fragmentary plan view thereof, taken approximately on the line 4—4, Fig. 3, and partly in section.

Fig. 5 is a fragmentary plan view thereof on a still larger scale, showing the means for releasing the articles from their compartments, the parts being shown in normal positions.

Fig. 6 is a fragmentary longitudinal sectional elevation thereof, taken approximately on the line 6—6, Fig. 5.

Fig. 7 is a fragmentary plan view thereof similar to Fig. 5, but showing some of the parts in different positions.

Fig. 8 is a fragmentary longitudinal sectional elevation thereof, taken approximately on the line 8—8, Fig. 7.

Fig. 9 is a fragmentary transverse sectional elevation thereof on line 9—9, Fig. 4, showing parts of the mechanism at the right-hand side of the machine.

Fig. 10 is a view similar to Fig. 9, but showing the parts of the mechanism at the left-hand side of the machine.

Fig. 11 is a fragmentary transverse sectional elevation, on an enlarged scale on line 11—11, Fig. 4.

Fig. 12 is a similar view, on line 12—12, Fig. 4.

Fig. 13 is a perspective view of one of the article supporting and releasing members.

Fig. 14 is a perspective view of the rear portion of another of these members.

Fig. 15 is a sectional plan view of the machine, taken approximately on line 15—15, Fig. 2.

Fig. 16 is a fragmentary longitudinal sectional elevation thereof, taken on line 16—16, Fig. 2.

Fig. 17 is a fragmentary sectional elevation indicating in full and in broken lines respectively various positions taken by an article during its movement from its compartment to the point of discharge.

Fig. 18 is a fragmentary plan view of a modified form of the machine in which articles of different kinds may be selectively dispensed.

Fig. 19 is a fragmentary view, partly in front elevation and partly in vertical section, of the machine shown in Fig. 18.

My improved apparatus may be arranged within any suitable or desired housing, that shown including a plurality of upright walls A, which may, if the articles to be sold are to be kept cold or hot, be provided with suitable heat insulation B. The top of the housing may be covered in any suitable manner (not shown), and at a suitable distance beneath the top, there is provided a magazine or support of any suitable construction for the articles to be dispensed. In the particular construction illustrated, this article support or magazine is formed by a plate 25, which may, if desired, be reinforced or supplemented by another plate 26. The two plates are spaced apart and supported from one of the upright walls of the housing by means of an angle-shaped bar 27 secured to the housing. The opposite or front edges of the supporting plates 25 and 26 are supported from a cross member or beam 28, the ends of which are suitably secured to two opposite walls of the housing.

In accordance with my invention, each article to be vended is supported in its own space or compartment. These compartments may be of any suitable or desired form, and in the construction illustrated, a plurality of tubes 30 of substantially cylindrical form are provided for supporting the articles X, which, by way of example, are in the form of bottles containing beverages. The plates 25 and 26 are provided with holes through which the tubes 30 extend so that upper portions of the tubes above the plates form compartments for the articles, and the lower portions of the tubes 30 below the plate 26 act as guides through which the articles drop when released from their supported positions in the upper portions of the tubes.

The tubes or compartments are preferably arranged in groups, such as rows, those shown extending both lengthwise and crosswise of the machine, but other arrangements for grouping the articles may be provided.

In order to support the bottles or other articles in the upper portions of the compartments 30, each compartment is provided with a slot or opening 32 extending about a relatively small portion of the periphery of the tube or compartment, and an article retainer 34 is arranged to extend through this slot or opening into the

compartment to a slight extent sufficient to support the article in the upper portion of the compartment, the retainer being movable through the slot out of supporting position to release the article so that the same may drop downwardly through the tube to be delivered at the discharge of the machine. One of these retainers is provided for each compartment and each retainer is secured to an arm 35, the arms being arranged adjacent to the compartments on the exterior thereof, and as clearly shown in Fig. 4, these arms are arranged in groups, a group being arranged at one side of each row of compartments and being supported by the top plate 25. Each arm extends to one edge of the plate, for example, to the front edge which is supported on the frame member 28. Since each compartment of a row is located at a different distance from the front edge of the plate 25, the arms for the various retainers of each row or group are all of different lengths so that they all terminate near the front edge of the plate 25. Since each arm of a row must be capable of moving independently of every other arm, all of the arms, except the last one, nearest to said edge of the plate 25, are provided adjacent to the retainers 34 with bends or offsets 36, and these bends are also of different lengths, so that the main portions of the arms 35 of a group are arranged one above the other and spaced apart from each other, as clearly shown in Figs. 3 and 12. Each arm and its retainer 34 are guided for movement in the direction of the length of the arm in any suitable manner, and in the construction shown, each of the retainers 34 is provided with a longitudinally extending slot 37 through which a screw or pin 38 extends, which is secured to the plate 25. The length of the slot 37 is sufficient to permit the retainer to move into and out of supporting position for the article.

I also provide means for moving the retainers in one direction and resilient means for moving the retainers in the opposite direction. In the particular construction illustrated by way of example, I have shown a spring 40 for each retainer, one end of the spring being secured to the retainer and the other end to the plate 25 or other stationary part.

By means of the construction described, it will be noted that the compartments and retainers are arranged in groups, each longitudinal row of compartments comprising a group, and the retainers and arms are also arranged in a group. This arrangement can be duplicated for each row, which may, of course, have as many compartments as may be desired. Other means for releasably retaining the articles in their compartments may, of course, be provided, if desired, and other arrangement of the articles into similar groups may be provided, if desired.

The front end of each arm 35 is connected to a link 42, and these links, in the construction illustrated, are spaced from each other in a horizontal direction while the arms are spaced from each other in a vertical direction. In order to connect each arm to its corresponding link, the front end of each arm is provided with a horizontally and laterally extending portion 43 terminating in a downwardly extending projection or lug 44, the lower end of which is connected with a link 42, see particularly Figs. 11 and 13. The parts 43 and 44 of each arm differ in length from corresponding parts of other arms of a row, as clearly indicated in Fig. 11. The front ends of the arms may be held in correct relation

one above the other, in any suitable manner, for example, by means of the outer peripheries of the tubes or compartments 30, or if desired, posts 45 may be provided at the front edge of the plate 25, which are spaced to receive between them the front ends of the arms 35.

The laterally extending parts 43 of adjacent arms 35 preferably extend in opposite directions, as shown in Fig. 11, to provide for ample spacing between adjacent links 42.

From the foregoing description, it will be obvious that if any link 42 is moved toward the front of the machine, the corresponding arm 35 and retainer 34 connected therewith will be moved forwardly thereby to release the article contained in the corresponding compartment or tube 30. Any suitable means may be provided for moving the arms 35 forwardly one at a time, for example, by means of a member having a plurality of spaced projections or parts capable of actuating the links 42 and which is movable through a small increment of movement at each actuation, the movement being sufficient to cause one projection to actuate one link at each increment of movement. By way of example, I have disclosed in the drawings, a rotary member which is turned through a small fraction of a revolution at each actuation of the machine, and which is provided with parts spaced thereon, in such a manner that at each partial turn of the rotary member, one arm 35 will be moved forwardly to release an article, the arm being again moved backwardly by its spring 40 into position to receive another article. This movement may either be imparted directly to an arm 35 or link 42, or, if desired, as shown in the drawings, through the medium of a plurality of levers 50, one being provided for each link 42 and having an arm thereof pivotally connected with a link. These levers are pivotally mounted to swing independently of each other about one or more shafts 51 and the other arms of the levers each have a tooth 57.

Any suitable means for mounting the shafts 51 may be provided. For example, I have shown a transverse beam or frame member 53 extending across the machine from side to side, the opposite ends of the beam being supported on inwardly extending flanges of supporting brackets 54 secured to the side walls A of the housing of the machine, see Figs. 9 and 10. The same brackets 54 also have inwardly extending flanges 55 to which the transverse frame members 28 may be secured, thus providing a fixed relationship between the frame member 28 which supports the front end of the plates 25 and 26 and the beam 53 on which the actuating mechanism for the retainer arms 35 is mounted.

As clearly shown in Figs. 3 and 8 to 10, the beam 53 supports a plurality of substantially U-shaped brackets having downwardly extending legs 55 and horizontally extending webs 56 which may be secured to the lower face of the beam 53 in any suitable or desired manner, for example, by means of screws, as in Figs. 3 and 8. One of these brackets is provided for each group or longitudinal row of articles and the lower ends of the downwardly depending legs 55 of each bracket is provided with a shaft 51 rigidly secured thereto, and on which the number of levers 50, corresponding to the number of articles in a longitudinal row or group, are pivoted. Suitable spacing hubs or collars 59 are shown to space the levers in correct relation to each other on a shaft 51 and these hubs may be formed

on or secured to the levers 50. Each of the levers is provided with one of the downwardly extending arms or teeth 57 which, as shown in Fig. 3, is adapted to cooperate with one tooth or projection 58 of a rotary member on which these teeth are arranged in staggered relation.

The rotary member carrying the teeth or projections 58 may be of any suitable or desired construction, and as shown in the drawings, this member comprises a shaft 60, the ends of which are suitably journaled in downwardly depending legs 61, the upper ends of which are secured to the supporting beam 53 in any suitable manner, for example, by being welded thereto, or by being formed in one piece therewith. A strap 62 serves to hold the shaft 60 in place on each of the depending legs 61.

On the shaft 60, I mount a plurality of segments 64 of a cylinder, on which segments the teeth or projections 58 are arranged. One of these segments is provided for each group or row of compartments 30 and, consequently, all of these segments may be identical. The cylinder segments 64 in the construction shown are made of sheet metal and the teeth 58 are stamped out of each segment, as clearly shown in Figs. 5 and 6. Each of these segments may also be formed integral with a disk 65 which may be suitably mounted to revolve with the shaft 60. In the construction shown, each disk 65 is rigidly secured to a hub portion 66 and the shaft 60 extends through all of the various hubs 66 on which the disks 65 are secured.

As shown in the several figures, each cylinder segment 64 is mounted in a different relation to the shaft 60, both lengthwise and circumferentially thereof. In order to facilitate the assembly of the segments in correct relation relatively to each other, I provide each disk 65 with a series of apertures corresponding in number to the number of segments to be used on a machine. For example, in the machine illustrated, twelve segments are shown, and consequently, twelve holes 67 are provided in each of the disks 65, these holes being all equally spaced from each other and located in identical relation to the cylinder segment of a disk. Consequently, when the disks and their hubs 66 are assembled on a shaft 60, a rod 68 is passed through one hole of each disk and the disks are so positioned relatively to each other that their cylindrical segments are all spaced in different positions about the axis of the shaft. By means of the rod or pin 68, which may be suitably secured in place on the disks, the several cylindrical segments can be easily assembled and retained in correct relation to each other. If desired, the hubs 66 of the disks may, in addition, be provided with pins or set screws for securing the same to the shaft 60 after they have been correctly positioned by means of the rod 68, or the hubs may be connected with each other to rotate about the shaft 60.

By means of the construction shown, it will be obvious that the teeth or projections 58 of the cylindrical segment 64 will all be spaced in different angular positions about the axis of the shaft 60 so that only one tooth at a time will actuate a lever 50, and when properly assembled, the teeth will be spaced from each other circumferentially as shown in Fig. 3. The teeth 58 will, of course, also be spaced lengthwise of the rotary member, so that each tooth will be positioned to engage one of the levers 50.

Considering particularly Figs. 6 and 8, if the

rotary member is turned through an increment of movement or a small fraction of a revolution corresponding to the circumferential distance between teeth, a tooth 58 will engage the arm or extension 57 of a lever 50 as shown in Fig. 6, and the continued movement will swing the lever 50 from the position shown in Fig. 6 to the position shown in Fig. 8, thus also moving the corresponding link 42 connected therewith and the retainer arm 35 connected with the link, to an extent sufficient to move the article retainer on the rear end of the arm 35 into a position to release an article, so that it drops downwardly through its compartment or tube 30.

Any suitable or desired means may be provided for imparting increments of motion to the rotary member, including the several cylindrical segments 64. In the construction shown for this purpose, I have provided a ratchet wheel or disk 70 which is suitably secured to the rotary member, that shown being provided with a hub 71 which may be secured to the adjacent hub 68 of a disk 65 or to the shaft 60. This ratchet wheel has ratchet teeth corresponding in number and in circumferential spacing to the teeth or projections 58 of the rotary member. I also provide a pawl 72 yieldingly pressed into engagement with the ratchet teeth of the wheel 70 by suitable means, such for example as a spring 73. The pawl is pivotally mounted on a pawl lever 74 having a hub 75 pivoted to oscillate freely on the shaft 60.

The pawl lever 74 is mounted to oscillate to a sufficient extent about the shaft 60 to move the pawl 72 through a distance sufficient to advance the ratchet wheel 70 through the distance of one tooth. Any suitable means may be employed for limiting the oscillation of this pawl lever, and in the construction illustrated, see particularly Figs. 3 and 10, I provide a stop pin or projection 76 on the lower end of the downwardly extending arm 61. This pin is so located as to engage the pawl 72 to limit the movement thereof in a direction to advance the rotary member. In order to limit the movement of the pawl lever 74 in the opposite direction, I provide a stop member 77 which is suitably secured at one end to the downwardly extending arm 61 and which is bent so that the other end may engage the pawl lever 74 when the same has moved to one limit of its movement. Consequently, one oscillation of the pawl lever 74 will move the ratchet wheel 70 and the rotary member through a distance sufficient to release one article. Any other means may, of course, be provided for providing a step by step movement of the rotary member.

The pawl lever 74 may be oscillated in any suitable or desired manner. If the dispensing machine is employed merely for delivering articles one at a time for sale by a clerk, the pawl 74 may be actuated by hand. If it is desired to utilize my improved machine for automatically vending articles, the actuation of the pawl lever 74 may be through the medium of a coin controlled mechanism. Preferably, I actuate the pawl lever 74 by means of a solenoid 80 having a core 81 connected by means of a link 82 to one end of the pawl lever 74. The solenoid imparts movement to the pawl lever in one direction only, and movement in the other direction may, consequently, be imparted by means of a spring, such as the coil spring 83 clearly shown in Figs. 3 and 10. When the coil of the solenoid is energized by means of electric current pass-

ing through the same, the core 81 will be drawn inwardly from the position shown in Fig. 3 against the action of the spring 83 and will thus move the pawl lever 74 to the right in Fig. 3 so that the pawl 72 is moved into engagement with another tooth. Upon interruption of the supply of current to the solenoid coil, the pull on the core 81 is interrupted and the spring 83 will yieldingly move the pawl lever 74 to the left in Fig. 3, thus moving the rotary member through the distance of one tooth.

The circuit including the solenoid coil may, of course, be actuated manually in case the machine is employed merely for dispensing articles. If the machine is employed for vending the articles, some suitable means are preferably employed for completing the circuit through the solenoid coil when a coin or token is deposited in the machine. Any suitable means may be provided for this purpose, and in the construction illustrated by way of example, I have shown more or less diagrammatically means for accomplishing this purpose. I have also shown in Fig. 3 a coin actuated mechanism which is arranged to be actuated by two coins, in case the price of the article necessitates the use of two coins, but it will be obvious that if a single coin is to be used to actuate the mechanism, certain of the parts shown may be omitted.

84 and 85 represent coin tubes or passages, which may be located side by side and for example, the tube 84 may be of a size to permit a one cent piece to drop through the same, while the tube 85 may be of larger size to receive a five cent piece. Upon leaving the tubes or passages 84 and 85, the coins or tokens will strike a movable coin receptacle 86 pivoted at 87 on a fixed part of the machine. The coin receptacle is normally held in the position shown in Fig. 3 by yielding means, such as a spring 88, against the stop 89. The movable coin receptacle has a pair of channels formed in the upper face thereof, one channel being located beneath each of the coin chutes 84 and 85 so that the coins will drop from the chutes into the two channels. In its upper position as shown in Fig. 3, the coin troughs or channels are arranged at a very slight inclination so that the coins will slowly roll in these troughs to the lower ends thereof, at which they are stopped by means of transverse abutments or stops 90. The movable coin receptacle 86 is so balanced by means of the spring 88 that the weight of one coin at the outer end thereof will not swing the coin receptacle about its pivot 87 but the weight of two coins will swing the movable coin receptacle downwardly into a circuit closing position, in which position a circuit will be closed, as diagrammatically indicated in Fig. 3, by having the coin receptacle engage a contact or terminal 91 connected by means of a conductor 92 to a current supply line 93. Any suitable means may be provided for completing the circuit to the solenoid 80 when the movable coin receptacle is swung into its lower position. For example, the movable coin receptacle 86 may be made of conducting material and connected to a conductor 94 leading to one terminal of the coil of the solenoid 80. The other terminal of the coil is connected by means of a conductor 95 to the other current supply line 96. After the coins have depressed the movable coin receptacle 86 and completed a circuit through the solenoid coil, they will be discharged from the receptacle by rolling over the stops or abutments 90 into

a suitable coin receptacle (not shown), so that the spring 88 will again return the movable coin receptacle 86 into the open circuit position shown in Fig. 3, in which the machine is ready for another operation. Any other means for supplying current to the solenoid coil to release an article from the machine may be employed, if desired, and if only one coin is required as the price of the article, one of the coin tubes 84 or 85 may be omitted and also one trough of the movable coin receptacle, in which case the spring 88 is of such strength that it will permit the movable receptacle 86 to be swung down by the weight of one coin only.

The articles are delivered from their compartments through a series of inclined chutes or slideways along which the articles move by gravity, the last chute terminating in a discharge opening 100 in the front wall of the machine, and preferably a trough-shaped receptacle 101 having an end or stop wall 102 is provided which extends outwardly beyond the opening 100. When the articles are delivered to the receptacle 101, they can easily be removed therefrom by hand. An inclined trough-shaped chute 103 extends from the rear wall of the housing to the delivery opening 100 and this chute 103 is arranged in the middle portion of the machine to receive articles from both sides thereof as well as articles discharged from compartments arranged immediately above the chute. In the particular construction shown, this chute is arranged underneath four longitudinal rows of compartments for the articles in order to insure the movement of the articles down this chute in a lengthwise direction.

The articles located at opposite sides of the chute 103 are discharged from their compartments upon inclined slideways 106 which may be in the form of substantially flat inclined plates secured at their upper ends to the side walls of the housing and having their lower edges terminating at the sides of the chute 103. In order to guide the articles in their movement along the inclined slideways 106, so that they will move lengthwise down these slideways, a series of partitions or upright walls 107 may be provided, arranged below the spaces between transversely extending rows of compartments.

With some types of articles, it is desirable to have the articles supported in their compartments and delivered through the opening in the machine with their tops uppermost. This is particularly desirable in connection with bottles containing milk or other drinks in which damage to the closure might result if the bottle is delivered with the upper end downward and strikes the stop wall 102. In order to prevent this from happening, I arrange the lower ends of the article compartments or tubes at approximately the same distances vertically above the inclined slideway 106, so that the lower portions of the tubes 30 will vary in length, as clearly shown, in Fig. 2, the tubes nearest to the sides of the housing and the upper ends of the inclined plates 106 being the shortest and those nearest to the chute 103 being the longest. The lower end of each tube 30 should be positioned above the portion of the slideway 106 which is immediately beneath it in such a manner that the distance from the slideway to the lower end of the tube is somewhat less than the height of the article. Consequently, if an article drops downwardly through the tube 30 and strikes the inclined slideway 106, the upper portion of the article

will still be within the lower end of the tube 30. The bottom of the article, upon striking the inclined slideway 106, will begin to slide down a slideway, while the top of the article is still within the tube 30 and consequently, the article will be inclined or tilted in such a manner that it will slide down the slideway bottom first.

Since some of the articles must drop through a considerable distance to the slideways, I prefer to provide cushioning means which the articles will strike. In the construction shown for this purpose, portions of the inclined plates 106 forming the slideways are cut out to form openings 108 and cushioning springs 109 are stretched lengthwise in these openings, the ends of the springs being secured to the plates 106 at the edges of the openings. These springs will yield when struck by an article and also will offer very little resistance to the movement of the articles along the slideways. These cushioning springs may be employed on some or all of the slideways, or if the articles are light, the cushioning means may be entirely omitted.

In the construction shown, the four middle rows of articles which are not arranged above the slideways 106, are located directly above the chute 103, and since some of these articles are supported at a considerable elevation above the chute 103, particularly those located nearest to the front of the machine, I provide additional means for delivering articles from these rows from the machine, such means including a device for breaking the fall of the articles from the tubes to the chute. This device, in the particular construction shown, is in the form of a yieldingly supported chute 110, which may, for example, be pivoted or hinged at 111 on the rear wall of the housing. This chute is slightly narrower than the chute 103, so that the sides 112 of this chute may pass between the sides 113 of the chute 103, and if desired, this pivoted chute may also be provided with a central partition wall 115. This hinged chute is yieldingly supported in the upper portion shown in Figs. 2 and 16 by any suitable means, such for example as coil springs 116, the springs being of such strength that the weight of an article on the pivoted chute 110 will cause the chute to swing downwardly into the position shown in broken lines in Fig. 16. Stop means are preferably provided for limiting the extent to which the hinged chute may swing upwardly, and if desired, the side walls of the chute may extend upwardly so as to abut against the lower frame plate 26 when in its upper position. The lower ends of those tubes 30 which are above the hinged chute 110 preferably are also arranged so that the vertical distance between the bottom 110 of the pivoted chute and the lower ends of the tubes 30 will be less than the height of the articles. Preferably, the portion 118 of the hinged chute nearest to the pivot 111 is inclined downwardly to a greater extent than the remaining portions of the chute, so that an article discharged from the rearmost tubes 30 will move forwardly on the pivoted chute immediately after striking the chute. In this manner, the weight of the article will act on the movable chute at a greater distance from the hinge or pivot 111 so that the weight of the article will promptly cause the front end of the pivoted chute 110 to swing downwardly. The relationship of the tubes to the inclined chute is such as explained in connection with Fig. 17 so that bottles or other

articles will move down the hinges chute bottom first.

It will be noted also that by pivoting the movable chute 110 as shown, this chute, when in its upper position, will be out of the way so as not to interfere with the discharge of articles from the sides of the machine, which articles can pass from the slideways 106 to the fixed chute 103 underneath the movable chute 110.

Any other means for checking the drop of the articles from their initial positions in the tubes may be provided. While I have shown a movable chute only above the discharge chute 103, it will be obvious that pivoted chutes could also be employed for discharging some or all of the articles from compartments or tubes arranged above the slideways 106.

It will be noted that the space at the front of the machine above the operating mechanism for the article retainers is not occupied by compartments for the articles and preferably a shelf 120 is provided in this space, on which a reserve supply of articles may be supported. If the upper part of the machine is to be cooled by any suitable means, such as a cooling coil of a refrigerating system (not shown), then the shelf 120 may serve to precool some of the bottles or articles supported thereon before they are positioned in the individual compartments 30. When the interior of the housing of the machine is cooled, a small trap door or curtain (not shown) may be provided at or near the discharge opening 100 to resist or retard the escape of cool air from the housing.

The machine as thus far described is constructed to operate only on one type of article. It will be understood, however, that my machine can easily be adapted to operate on two or more different articles, and in Figs. 18 and 19, I have shown a modified construction suitable for use in connection with two different articles or commodities, such for example as two different kinds of beverages. In such case, two different rotary members may be provided, one of which includes a plurality of disks 125 having cylindrical segments 126 adapted for cooperation in connection with compartments 127 for one type of beverage, while the other rotary member is provided with a series of disks 128 also having cylindrical segments (not shown) for cooperation with compartments 129 containing another kind of beverage. The inner ends of the two rotary members may be supported on a common bearing 130 mounted on a suitable part of the frame and each rotary member is provided with a ratchet wheel 132 which may be similar in construction to the ratchet wheel 70 heretofore described, and a similar ratchet mechanism may be employed. One ratchet mechanism may be actuated by means of a solenoid 135 and the other mechanism by means of a solenoid 136. The rotary members are only partly shown in Figs. 18 and 19, and the retainers and the actuating mechanism therefor are omitted for sake of clearness, and it will be understood that all of these parts may be identical with those shown in the preceding figures.

The purchaser may select the type of article which he desires by means of a suitable indicator arranged on the exterior of the housing, such for example as a knob 140 having a pointer 141, the knob being rotatable to move the pointer to either of two positions to indicate the type of article or beverage desired, see Fig. 19. The knob also has secured thereto a switch or con-

tact member 142 arranged in the interior of the housing and adapted to make contact with either of two terminals 143 or 144. The movable switch arm or contact member 142 is connected by means of a conductor 146 to a coin actuated circuit closing member 147, which may be similar to the member 86 hereinbefore described, or which may be of any other suitable construction, that shown being made to operate on a single coin or token. When this member is moved into circuit closing position by a coin, current may pass to it through a conductor 148 from an electric current supply line 149. The contact member 143 is connected to the solenoid 136 by means of a conductor 150 and the other terminal of the solenoid is connected to the other current supply line 152 by means of a conductor 153. The other terminal 144 is connected by means of a conductor 154 to a terminal of the other solenoid 135, the other terminal of which is also connected to the conductor 153 leading to the power line 152. By means of this arrangement, the same coin controlled circuit closing mechanism may be employed for any number of different types of articles to be dispensed and the knob 140, which is set by the purchaser, controls the flow of electric current to one or another solenoid to release the type of article desired. While I have shown in the drawings only two separate rotary members for dispensing two types of articles, yet it will be obvious that the construction shown in Figs. 18 and 19 may be used for dispensing any desired number of different types of articles.

The machine described has the advantage that it is capable of being built for a very large capacity in a limited space, and the mechanism for releasing the article is of such construction that it comprises many identical parts which can be easily and inexpensively produced, namely, from metal stampings, and which can be easily grouped and assembled to produce a machine which is comparatively inexpensive and very reliable and positive in its operation. The amount of power required to release an article is very small, so that no motor is required, but merely one or more solenoids. By means of my improved chutes and inclined slideways, articles can be discharged by gravity from any compartment in the machine. The machine requires no actuation by the operator other than to deposit the coin, unless the machine is of the type shown in Figs. 18 and 19, in which case, the operator may also adjust the knob or indicator to select the kind of article that he wants. When the various compartments of the machine are filled by an attendant, the article retainers are always in their operative positions, so that it is merely necessary for the operator to position articles in the individual compartments provided therefor.

I claim as my invention:

1. In a machine for dispensing articles, the combination of a plurality of compartments, each adapted to contain one article, a retainer for each compartment for supporting the article therein, when in retaining position and to permit the contents of the compartment to be discharged when out of retaining position, a rotary member having a plurality of projections corresponding in number to said compartments, each projection being spaced from other projections both lengthwise and circumferentially of said rotary member, and parts associated with said retainers and extending into the path of movement of said pro-

jections about the axis of said rotary member, said projections engaging said retainers successively during the rotation of said rotary member to move said retainers into article releasing positions.

2. In a machine for dispensing articles, the combination of a plurality of compartments, each adapted to contain an article, a retainer for each compartment for supporting an article therein, when in retaining position and being movable out of article retaining position to permit an article to drop by gravity out of a compartment into a position accessible to a purchaser, a rotary member having a plurality of projections, each projection being spaced from other projections both lengthwise and circumferentially of said rotary member, parts associated with said retainers and extending into the path of movement of said projections about the axis of said rotary member, said projections engaging said retainers successively during the rotation of said rotary member to move said retainers momentarily into article releasing positions, and means for yieldingly urging said retainers into article retaining positions.

3. In a machine for dispensing articles, the combination of a plurality of compartments, each adapted to contain an article, a retainer for each compartment upon which an article therein rests, said retainer being movable into and out of article supporting position, a member movable by increments of movement and having a plurality of projections thereon spaced apart, a lever connected with each retainer and having a portion thereof located in the path of movement of one of the projections of said movable member for swinging said lever into a position to move said retainer out of its article supporting position, and means for guiding articles released by said retainers into position accessible to a purchaser.

4. In a machine for dispensing articles, the combination of a plurality of compartments, each adapted to contain an article, a retainer for each compartment for supporting an article therein, said retainer being movable into and out of article supporting position, a member movable by increments of movement and having a plurality of projections thereon spaced apart, a lever connected with each retainer and having a portion thereof located in the path of movement of one of the projections of said movable member for swinging said lever into a position to move said retainer out of its article supporting position, means for yieldingly urging said retainer into its article supporting position and said lever into position to be again engaged by a projection on said movable member, and means for guiding articles released by said retainers into position accessible to a purchaser.

5. In a machine for dispensing articles, the combination of a magazine including a plurality of compartments, each compartment being adapted to contain an article to be dispensed, said compartments being arranged in groups, the compartments of each group occupying the same relative positions as those of other groups, a group of retainers for holding the articles in said compartments, the retainers of each group being movable independently of each other, and a movable member formed of a plurality of segments having projections arranged to successively move the retainers of a group into article releasing positions during movement of said member, said segments all being identical, and

means for mounting said segments on said movable member in different relations to each other with reference to the direction of movement of said member, whereby said segments are moved one at a time into positions to move the retainers of different groups into article discharging positions.

6. In a machine for dispensing articles, the combination of a plurality of compartments arranged in groups, the compartments of each group being positioned in identical arrangement relatively to each other, a plurality of retainers for holding the articles in said compartments, the retainers of each group being positioned adjacent to each other, a rotary member comprising a plurality of identical cylindrical segments having projections, each segment being arranged to cooperate with the retainers of one group and being adapted during the rotation of said member, to move said retainers one at a time into article releasing positions, said segments being arranged in spaced relation both lengthwise and circumferentially of said rotary member to cause said segments to move one at a time into position to actuate said retainers.

7. In an article dispensing machine, the combination of a plurality of retainers for holding articles in position to be dispensed, a member movable by increments and having projections thereon for cooperation with said retainers and arranged so that at each increment of movement one projection thereon moves one retainer into an article releasing position, said member comprising a plurality of equal parts each carrying a number of said projections and secured thereto in step-like arrangement to move successively into positions to have their projections impart movement to said retainers.

8. In an article dispensing machine, the combination of a plurality of retainers for holding articles in position to be dispensed, and a member rotatable by increments of movement and having a plurality of substantially cylindrical segments arranged thereon, at different distances from an end of said member and spaced circumferentially from each other, said segments having projections thereon arranged to impart movement one at a time to said retainers to move the same into positions to release the articles.

9. In an article dispensing machine, the combination of a plurality of retainers for holding articles in position to be dispensed, a member rotatable by increments of movement and having a plurality of radially extending parts having cylindrical segments secured to the outer portions thereof, said segments being arranged in stepped relation to each other about the periphery of said member, and having projections thereon arranged to impart movement to said retainers to release said articles and positioned so that at each increment of movement one of said articles is released.

10. In an article dispensing machine, the combination of a plurality of retainers for holding articles in position to be dispensed, a rotary member having projections thereon for imparting movement to said retainers one at a time to release articles held thereby, said rotary member including a plurality of equal parts each having a hub, a radially extending disk and a cylindrical segment carrying some of said projections, each disk having a series of holes therein corresponding in number to the number of segments on said rotary member, said holes being equally spaced from the center of said member and equal-

ly spaced from each other, and a rod arranged parallel to the axis of said member and extending through one hole of each disk, to space said segments from each other circumferentially of said member.

11. In an article dispensing machine, the combination of a plurality of retainers for holding articles in position to be dispensed, a member movable by increments and having projections thereon for cooperation with said retainers and arranged so that at each increment of movement one projection thereon moves a different retainer into an article releasing position, and an electric circuit including a solenoid having a reciprocatory core connected with said member for imparting increments of movement thereto.

12. In a container dispensing machine, the combination of means for stationarily supporting a plurality of containers in upright positions and each independently of the others, an inclined discharge chute below a portion of said supporting means, for discharging containers one at a time from the machine, and an inclined slideway having its lower portion terminating in said chute and extending to a side of said chute and on which containers discharged from the portion of said means located above said slideway slide into said chute.

13. In an article dispensing machine, the combination of means for supporting a plurality of articles each independently of the others, an inclined discharge chute below a portion of said means for discharging articles one at a time from the machine, a hinged chute yieldingly held in an upper position to receive articles and swung by the weight of said articles into a lower position to discharge articles therefrom to said first mentioned chute, and an inclined slideway extending laterally of said inclined chute for discharging articles to said inclined chute below said hinged chute.

14. In an article dispensing machine, the combination of means for releasably supporting a plurality of articles with their tops uppermost, an inclined slideway below said supporting means on which said articles are dropped when released and on which the articles slide to discharge them from the machine, and substantially tubular members through which the articles, when released, drop to said slideway, the lower ends of said tubular members terminating above said slideway at a distance slightly less than the height of said articles, to cause the articles to slide on said slideway with their tops uppermost.

15. In an article dispensing machine, the combination of means for releasably supporting a plurality of articles arranged in rows extending transversely of the machine, an inclined slideway arranged below a plurality of said rows of

articles and upon which said articles are dropped when released, said slideway being provided with partitions arranged below the spaces between said rows to cause articles to slide lengthwise in said slideways transversely of the machine, and an inclined chute arranged below the lower portion of said slideway and into which articles pass from said slideway for discharge from the machine.

16. In an article dispensing machine, the combination of means for releasably supporting a plurality of articles each independently of the others, an inclined slideway arranged below said supporting means and upon which articles, when released, are dropped, and a plurality of coil springs stretched lengthwise of said slideway and upon which articles may drop and along which they may slide to be discharged from the machine.

17. In a machine for dispensing bottles, the combination of a plurality of compartments for supporting bottles in upright positions and arranged in a series of substantially parallel rows, each row having one end thereof terminating substantially in alinement with one of the ends of each of the other rows, a bottle retainer for each compartment upon which a bottle rests when in its compartment, said retainers having arms extending between said rows of compartments and terminating adjacent to said ends of said rows, the retainers and arms of one row being identical with the retainers and arms of the other rows and said arms extending beyond said aligned ends of said rows, each retainer and arm being movable independently of other arms and retainers into and out of position to move said retainers out of bottle supporting positions, a rotary member having its axis extending transversely of said rows beyond said ends thereof, projecting parts on said rotary member arranged about the axis of said member to move said arms and retainers one at a time into article releasing positions.

18. The combination of a plurality of retainers for holding articles in position to be released, a rotary member movable by increments and having projections thereon for cooperation with said retainers and arranged so that at each increment of movement one projection thereon moves a different retainer into an article releasing position, a ratchet wheel on said rotary member and having teeth thereon spaced apart at distances corresponding to said increments of movement, a pawl cooperating with said ratchet wheel and reciprocable to move said ratchet wheel through the distance of one tooth at each reciprocation of said pawl, and means including a solenoid having a plunger connected with said pawl for effecting reciprocation of the same.

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