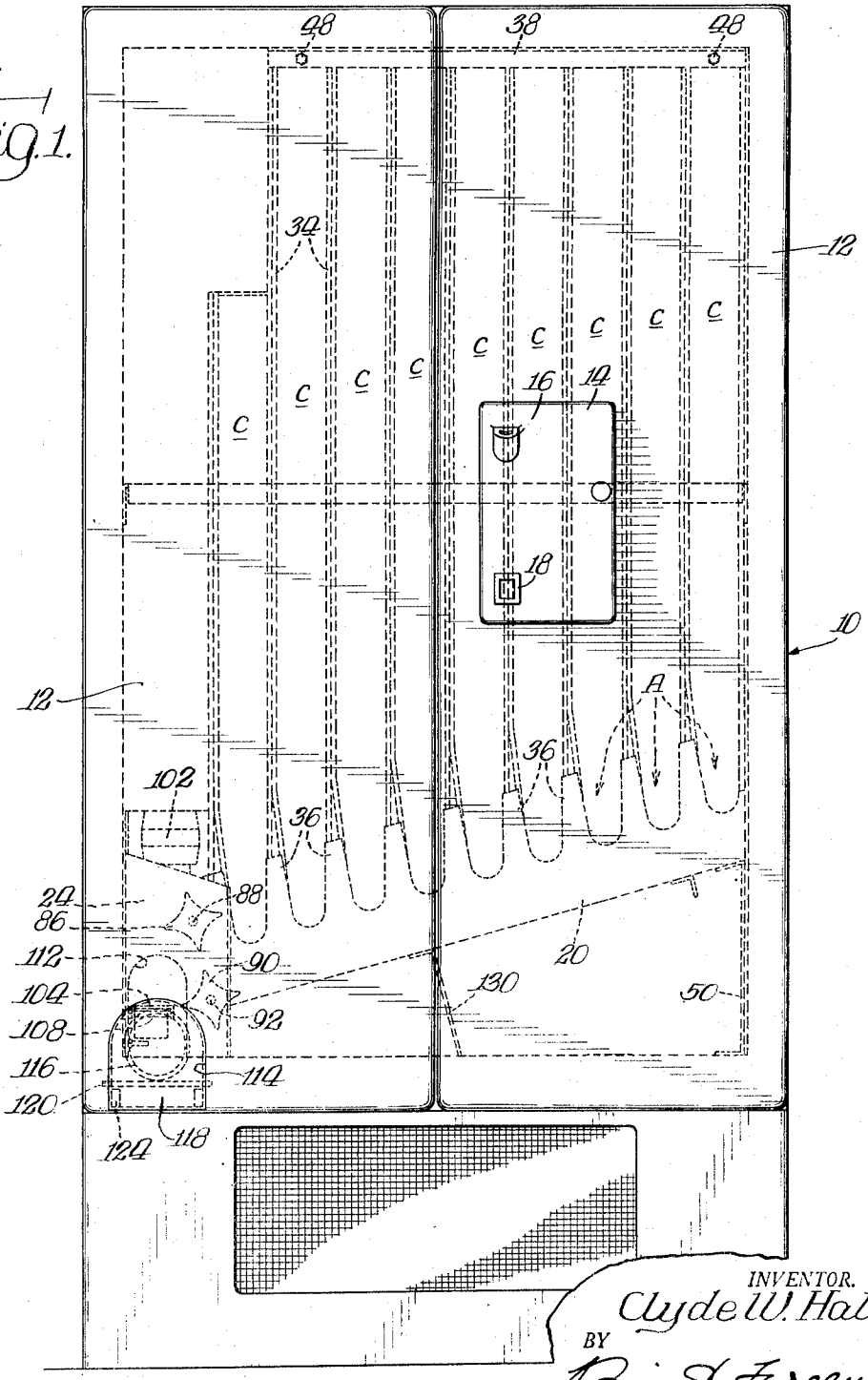
April 17, 1951 C. W. HALL 2,549,082

VENDING MACHINE

Filed June 24, 1948 5 Sheets-Sheet 1

Fig. 1.



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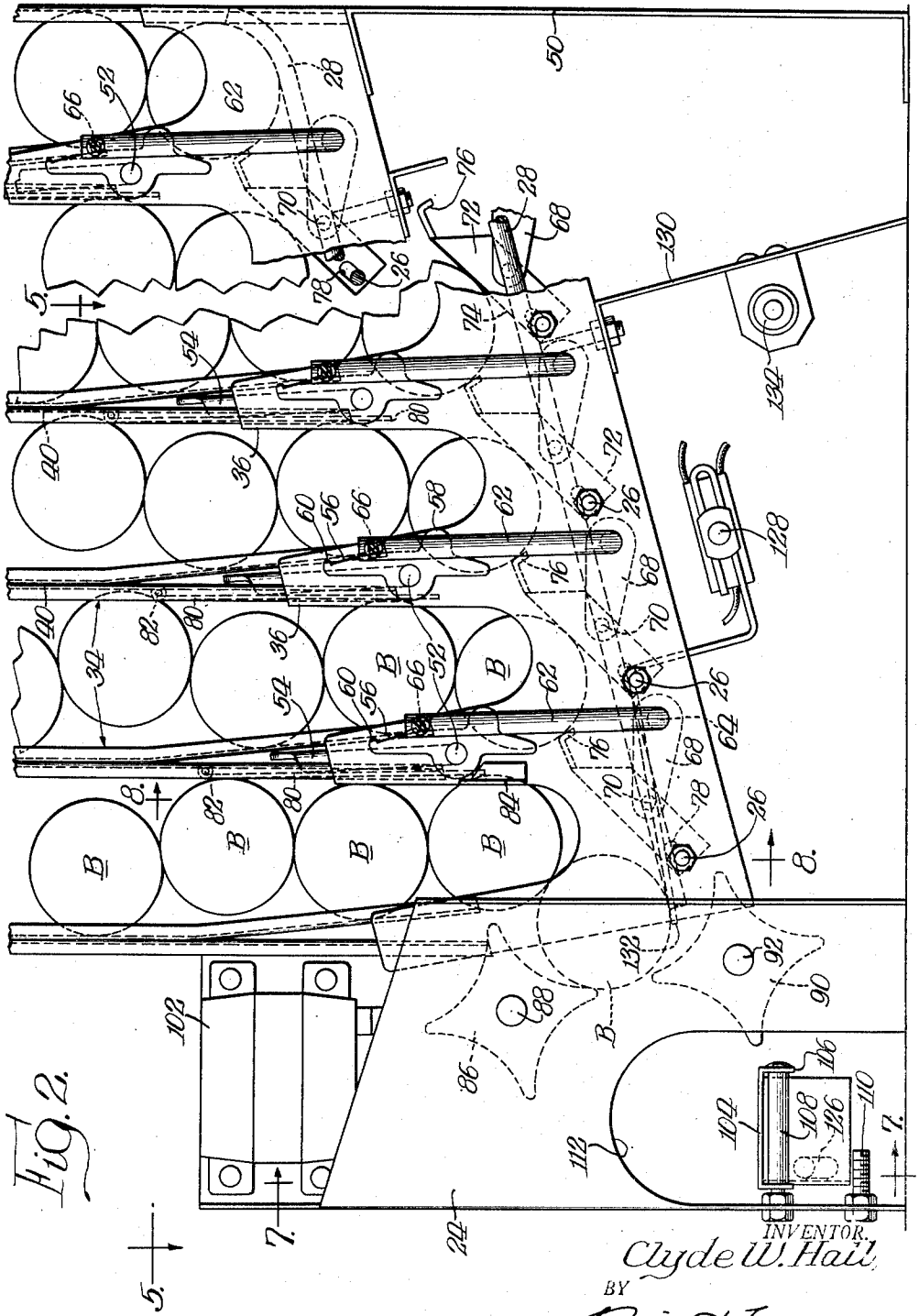


Fig. 2.

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VENDING MACHINE

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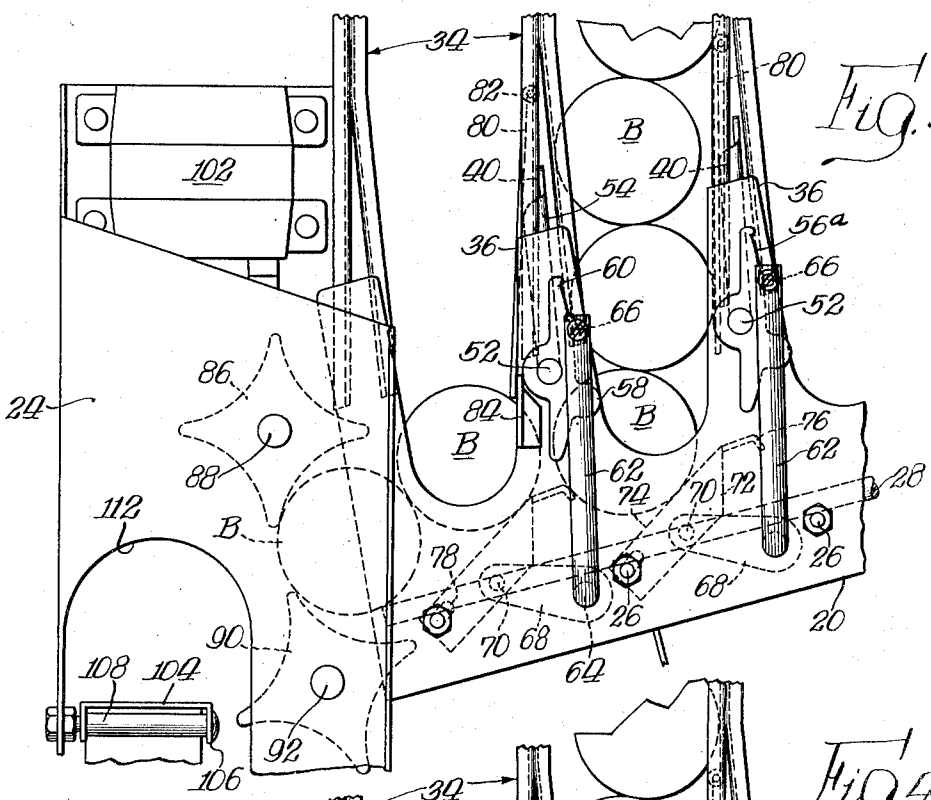


Fig. 3.

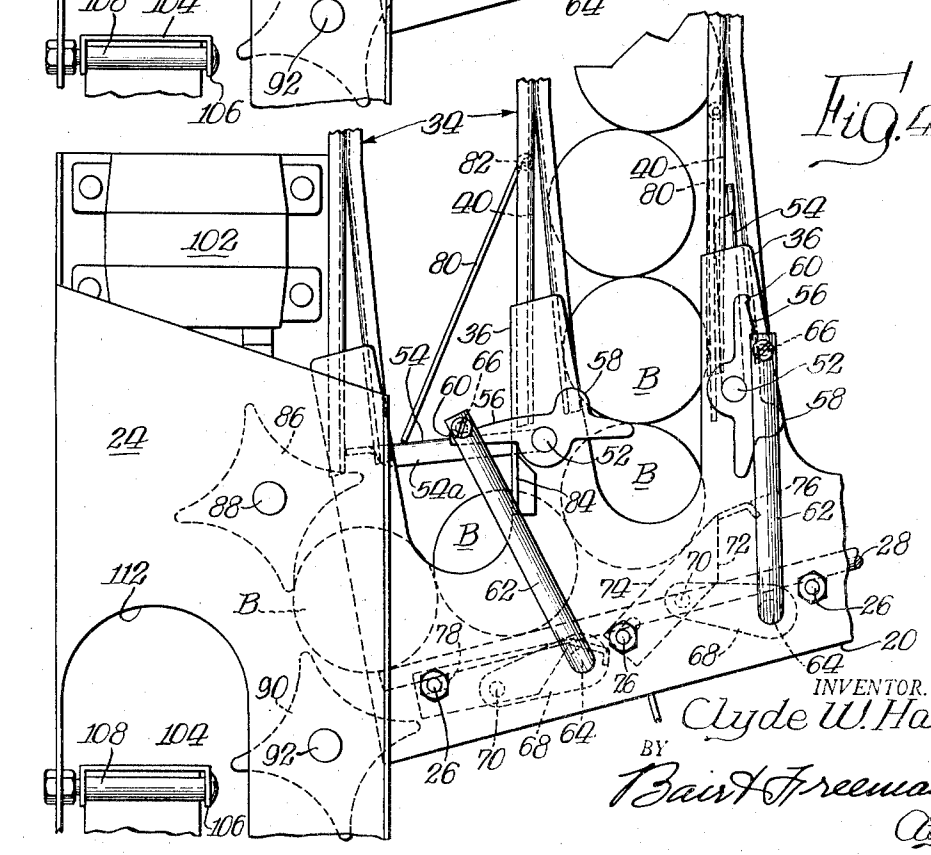


Fig. 4.

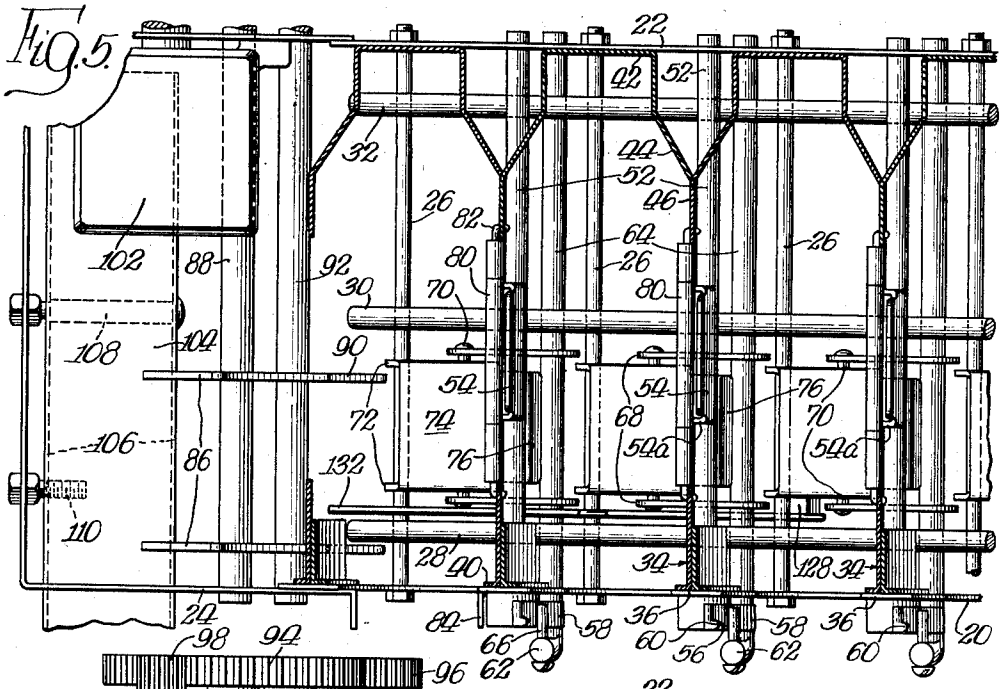
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April 17, 1951 C. W. HALL 2,549,082

VENDING MACHINE

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Fig. 5.



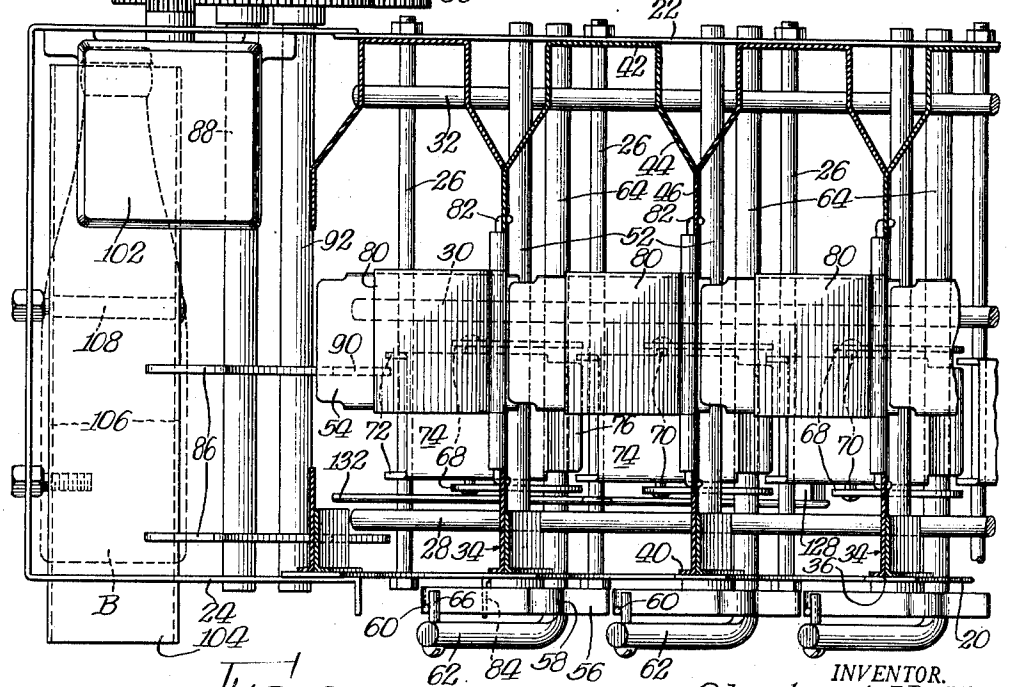


Fig. 6.

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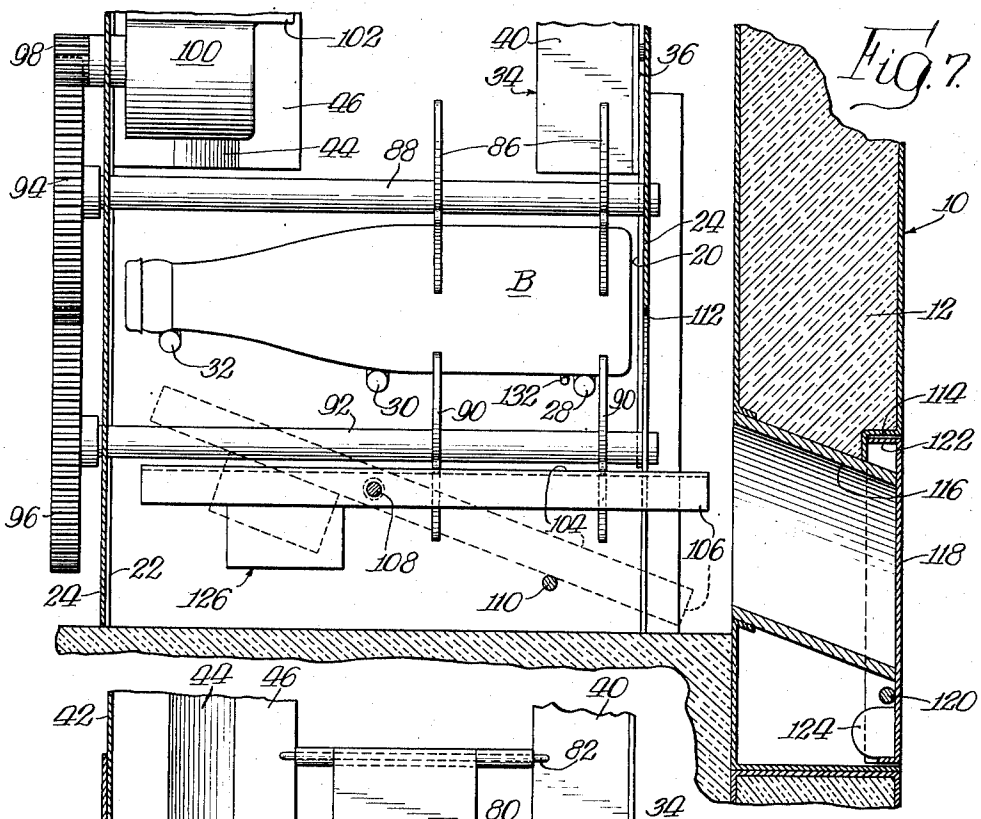


Fig. 7.

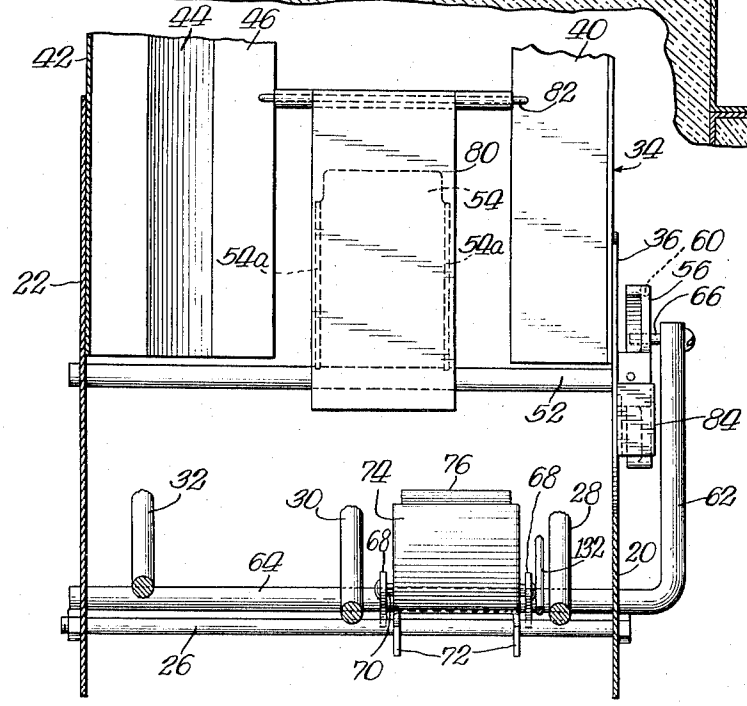


Fig. 8.

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Patented Apr. 17, 1951

2,549,082

UNITED STATES PATENT OFFICE

2,549,082

VENDING MACHINE

Clyde W. Hall, Chicago Heights, Ill., assignor to Highway Steel Products Company, Chicago Heights, Ill., a corporation of Illinois

Application June 24, 1948, Serial No. 34,915

5 Claims. (Cl. 312—48)

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The present invention relates to vending machines of the type for dispensing, directly to the customer, a unit number of articles incident to each operation of the machine. The machine herein disclosed is particularly adapted for dispensing bottled merchandise, either refrigerated or unrefrigerated, such as various types of beverages. While the machine is herein shown and described as being constructed and arranged for dispensing of bottled merchandise, it will be apparent that it is also applicable for dispensing of various other types of articles or packaged merchandise.

More particularly, the present invention is directed to vending machines of the gravity feed type, provided with suitable coin controlled mechanism for operating the machine and effecting dispensing of a unit number of articles of merchandise upon each actuation of the coin controlled mechanism, incident to insertion of the proper denomination of coin therein.

A vending machine of the above indicated type is disclosed and claimed in my copending application, Serial No. 644,473, filed January 31, 1946, and entitled "Vertical Vending Machine." This vending machine comprises a series of upwardly extending magazines adapted to contain stocks of superimposed articles and an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under the influence of gravity. The hopper has a discharge end adjacent the lower end thereof toward which articles in the hopper move under the influence of gravity. Delivery means are mounted in registration with the discharge end of the hopper in a position normally to hold the articles in the hopper in opposition to the gravity pressure exerted by said articles. Power driven means control the operation of the delivery means in response to each actuation of a coin controlled mechanism to permit a dispensing of a unit number of articles from the hopper by the gravity pressure exerted by the articles in the hopper. Separate means associated with the bottom of each magazine in the hopper are adapted normally to block the feeding movement down the hopper of articles from a next adjacent magazine and are adapted to be conditioned, incident to the feeding of the last article from the magazine, for permitting feeding down the hopper of articles from the next adjacent magazine.

One of the objects of the present invention is to provide an improved vending machine of the type indicated in the preceding paragraph having delivery means operative to handle articles, such as bottles, of different widths.

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Another object of the present invention is to provide an improved vending machine of the type indicated having separate means associated with the bottom of each magazine in the hopper that, incident to feeding of the last article from the magazine, are conditioned by snap action for permitting feeding down the hopper of articles from the next adjacent magazine, and that not only insure easy, positive and continuous movement of the articles but are also reset for reloading with a minimum number of manipulations.

Other and further objects, features and advantages of this invention will be apparent from the following description and appended claims, taken in connection with the accompanying drawings, in which:

Figure 1 is a front elevational view of a vending machine embodying the present invention, with the vending machine represented in dotted lines, wihin a refrigerated cabinet;

Figure 2 is an enlarged fragmentary view, with parts broken away, of the lower portion of the vending mechanism with the various magazines of the mechanism completely loaded with bottles, and with the mechanism in condition for dispensing;

Figure 3 is a fragmentary view showing the first magazine with the last bottle therein ready for feeding into the hopper and before actuation of the bottle holding means associated with the first magazine for permitting the feeding into the inclined hopper of the bottles from the next adjacent magazine of the series;

Figure 4 is a view similar to Figure 3, showing the position of the blocking means associated with the first magazine in its final releasing position after emptying of the first magazine for permitting proper feeding of the bottles into the hopper from the next adjacent magazine;

Figure 5 is a fragmentary cross-sectional view taken along the line 5—5 of Figure 2 showing the vending mechanism empty and in a position ready for reloading;

Figure 6 is a view similar to Figure 5, showing the machine completely emptied except for the last bottle which is ready for dispensing;

Figure 7 is a transverse vertical cross-sectional view taken along the line 7—7 of Figure 2; and

Figure 8 is a fragmentary vertical transverse cross sectional view taken along the line 8—8 of Figure 2.

The vending mechanism is completely enclosed within an insulated cabinet 10, which, it may be understood, is provided with suitable refrigerating apparatus (not shown). The front

of the cabinet is provided with a pair of hinged doors 12, which, when moved to open position, afford convenient access to the vending mechanism therein. It is to be understood that the cabinet may be provided with a suitable lock controlled latching structure, not shown, for maintaining the doors 12 in a closed position to preclude unauthorized access to the interior of the cabinet.

Mounted on one of the doors is a suitable coin controlled mechanism 14, of conventional construction, now commercially available, having a coin slot 16, and a return coin chute 18. The coin controlled mechanism is of the electrically operated type, and is set into operation upon the insertion of a proper denomination of coin in the slot 16, which serves to energize an electric motor which in turn controls the actual dispensing of merchandise from the machine. The control mechanism includes apparatus by virtue of which the motor circuit is maintained completed for a predetermined period of time until a bottle is dispensed by the mechanism, at which time the motor circuit is then broken and the control mechanism reset for another operation. Since the control mechanism per se does not constitute a part of the present invention, it is believed unnecessary to make any further disclosure thereof, especially in view of the fact that it is commercially available as a complete assembly.

The vending mechanism mounted within the refrigerated chamber of the cabinet 10 is a unitary structure which may be quickly and easily inserted in, or removed from the chamber of the cabinet so as to make it convenient for repair or replacement of a total unit. The vending mechanism includes side plates 20 and 22 at the lower end thereof, which extend in an upwardly inclined direction. The forward or lower ends of these side plates are rigidly attached to a sheet metal frame 24, of generally U-shaped formation, as clearly seen in Figure 6 of the drawings. The side plates are rigidly tied together by a plurality of longitudinally spaced apart, transversely extending tie rods 26. Welded on said tie rods are three, transversely spaced apart, longitudinally extending rods 28, 30 and 32, which are upwardly inclined in the right hand direction and extend the full length of the side plates 20, as clearly seen in Figure 2 of the drawings. The two rods 28 and 30 are closely spaced apart and are adapted to support the main body portion of the bottle. The guide rod 32 is disposed at a slightly higher inclined plane than the rods 28 and 30, in a position to be engaged by and to support the neck portion of the bottles, as will hereinafter be described. The lower portion of the machine, as defined by the side plates 20 and 22 and by the rods 28, 30 and 32, may, for convenience, be considered as an inclined hopper, designated generally at A, down which the bottles, as indicated at B, are adapted to move under influence of gravity. The rods 28, 30 and 32 constitute a guide and support for the bottles as they feed down the inclined hopper for dispensing. Thus the bottles are permitted to freely roll or slide down the rods of the hopper with minimum frictional resistance.

Extending upwardly from the side plate 20, at the inner side of the mechanism, adjacent the doors, are structural framing members 34. Said framing members are rigidly attached at their lower ends to spaced tongues 36 projecting upwardly from the side member 20, and the upper ends of said members are rigidly connected, as by welding, to a horizontally extending tie angle member 38. The members 34 are spaced apart in sets, in the longitudinal direction of the hopper, so as to define a series of vertically disposed magazines C, for storing the bottles B. The members 34 are provided with laterally extending flanges 40, and the pair of members which define each magazine have their respective flanges extending toward each other, and thus constitute guides for the bases of the bottles in the magazine.

Extending vertically, and secured at their lower ends to the side plate 22, as by welding, are guideways 42 for each of the magazines of the series. Each of the guideways is of generally U-shaped formation in cross section, as seen in Figure 5 of the drawings, and includes a pair of converging walls 44, every other one of which projects further inwardly, as shown at 46. Each of the guideways is located substantially in central alignment with the vertical median plane of the magazines, viewed in endwise relation, as seen in Figures 5 and 6 of the drawings. The upper ends of the guideways 42 are connected, as by welding, to a horizontally extending tie angle member (not shown) and the tie angle members at opposite sides of the upper ends of the magazines are connected together by tie rods 48. Connected to the elevated end of the side plates 20 and 22, as seen in Figure 1, is an angle iron 50 which, with the frame member 24, serves to support the entire mechanism in upright position.

The distance between the inner face of the flanges 40, at the front ends of the magazines and the flat central portions of the guideways 42, at the opposite end of the magazines, defines the length of each magazine, and the magazines serve to accommodate therein a multiplicity of bottles B, disposed in superimposed relation, with their axes extending approximately horizontally.

The distance between the adjacent framing members 34 of each magazine is such as to provide a magazine of such width as to permit stacking of bottles in the magazines in superimposed relation, as clearly seen in Figure 2 of the drawings, with one bottle disposed in laterally staggered relation to the next bottle in the magazine and with their axes laterally offset from each other, to insure that the base of each bottle is guided by one of the flanges 40 of the magazine frame elements 34. It will thus be apparent that it will not be possible to stack two bottles in vertical alignment, one upon the other in a magazine, and because of the off-center relationship of the axis of one bottle, the next superimposed bottle will be caused to assume a position at the opposite side of the magazine, as seen in Figure 2.

It is well known that the majority of bottles containing beverages adapted to be dispensed are produced with a slight longitudinal draft or taper reducing in the direction from the base of the body of the bottle, so that the body adjacent the shoulder or neck portion is slightly smaller in diameter than the diameter of the body at the base end. Upon insertion of a bottle into a magazine, the outer end of the neck portion of the bottle is caused to engage one of the converging surfaces 44 of the guideway 42, in a manner tending to cause the bottle to assume a substantially horizontal position in the magazine, and thus tending to compensate for the taper of the body of the bottle.

By virtue of the dimensional relationship of the

guide flanges 40 of the magazine for guiding the base ends of the bottles, and the converging walls 44 at the opposite end of the magazine, a bottle is caused to assume a laterally offset position with respect to the next lower bottle in the magazine. The neck of the bottle, by reason of its engagement wtih one of the converging walls 44, causes the bottle to move in a horizontal plane, so that the axis of the bottle, at the neck end, is closer to the axis of the next lower bottle, at the neck end, then are the axes of the two bottles at their base ends, when considered with respect to a horizontal plane. Thus the shoulder portion of a bottle contacts the shoulder portion of the next lower bottle at a higher vertical plane than the areas of contact of the base portions of said two bottles, and thus compensates for said taper or draft of the body of the bottles. By this arrangement, the bottles in a magazine are caused to assume a position with their axes extending in approximately horizontal planes. In the absence of such a construction, as above described, a plurality of superimposed bottles in a vertical magazine would cause successive bottles to increase in their angle of tilt, with respect to the lower bottles in the magazine, so that the uppermost bottles in the magazine would have their neck ends disposed below the lowermost portion of the base of the respective bottles. It is this difficulty which the foregoing construction is intended to obviate, as well as insuring elimination of the substantial noise and possible wedging of bottles as they are fed from the magazine into the dispensing hopper A.

As may be observed in the drawings, the lower end of each magazine is in open communication with the inclined hopper A. Suitable means is provided for controlling the feeding of the bottles from the magazines into the hopper in a manner so that all bottles must first be fed out of one magazine into the hopper, before the bottles from the next adjacent magazine are permitted to feed into the hopper. For this purpose, I provide separate blocking means, associated with each magazine except the first magazine of the series, for controlling the feeding of the bottles into the hopper. The blocking means for one magazine will now be described, and it may be understood that corersponding elements constitute the blocking means for each of the other magazines as above referred to.

Journaled in the tongue 36 at the front side, and in the side plate 22 at the opposite side of the hopper, is a rock shaft 52, to which is welded a bottle follower plate 54 having depending lateral flanges 54*a* extending short of the far end of the plate. The end of the rock shaft, at the front side of the machine, has rigidly attached thereto a control lever 56 disposed on the outside of the tongues 36. This lever is formed with an upstanding lug or ear 58 on its right hand side adjacent the fulcrum point on the lever and with an upstanding lug 60 at its left hand end. Cooperating with the cam lever is a control arm 62, mounted on a rock shaft 64, journaled in the lower portion of the tongue 36, to the right of the shaft 52, at one end, and the opposite end being journaled in the opposite side member 22 of the hopper. The upper end of the arm 62 is provided with an inturned stiff wire 66, which is adapted to cooperate with the cam surface 56*a* of the cam 56, for controlling the position of the bottle follower plate 54, in a certain position, and said cam serves to control movement of the arm 62 incident to the weight of the bottles in the magazine as hereinafter described. Rigidly attached to the rock shaft 64, in transversely spaced apart relation, are two separate levers 68, which are pivoted at 70, at their outer ends, to separate depending lateral flanges 72 of a blocking tongue 74 intermediate their length. As may be seen in Figures 5 and 6 of the drawings, the blocking tongue 74 is disposed between the rods 28 and 30, in the hopper, in a position so as to engage the body portion of the bottle as it is fed down the inclined hopper. One end of said flanges 72 is slotted as indicated at 78, and surrounds an adjacent tie rod 26 to permit longitudinal movement of the dog. The opposite end of the tongue 74 terminates in a downwardly bent nose 76, which normally extends a substantial distance above the bottle supporting rods 28 and 30, as seen in Figure 2, in a position to be encountered by the body of a bottle tending to move down into the inclined hopper A, under influence of gravity. In such position said tongue serves to block movement of said bottle. It thus will be apparent that the bottle follower 54, through its cam 56*a*, moves under control of the arm 62, due to the relationship of the wire 66 of said arm co-acting with the cam surface 56*a* of the lever 56.

A pad or plate 80 is hingedly suspended above the arm 54 on a rod 82, the ends of which are attached to opposed edges of the frame members 34 and the outermost wall portions 46 of the guideway 42.

When the machine is to be conditioned for loading the magazines with bottles B, the respective blocking mechanisms are adjusted to the position seen in Figures 2 and 6 of the drawings. It will be noted that the control arms 62 are in erect position, as are also the levers 56, with the end of each arm 62 to the right of the lever 56 with which the arm cooperates. Each follower arm or plate 54 is likewise erect, and the plates or pads 80 hang straight downwardly immediately to the left of the corresponding arms or plates 54. Finally, the blocking tongues 74 are lifted up so as to bring their free ends 76 into position for retaining the bottles B in the magazines C. With the parts in these positions, the machine can be loaded with bottles, starting with the magazine to the extreme left and proceeding to the right, each magazine receiving successively at least two bottles. Figure 2 shows the machine in loaded condition. There, the weight of the bottles in each magazine (except the first magazine on the extreme left) is supported from below by the free ends 76 of the blocking tongues 74. The resulting thrust tends to depress the levers 68 and to rock the shafts 64 counterclockwise, to move the arms 62 to the left, and to snap the levers 56 counterclockwise into approximately horizontal position. The levers 56 in turn tend to rock the shafts 52 counterclockwise and thereby to snap the plates 54 over to the left. But the plates 54, in such leftward snapping movement, encounter the depending arms or plates 80 which cannot swing over to the left, being held against swinging movement by the bottles B in the magazine to the left. The one magazine C to the extreme left is not provided with blocking means at its bottom, as shown in Figures 2 to 4. Hence, as the dispensing mechanism is operated (as described hereinbelow), bottles are fed from this magazine until but one bottle B remains therein, as shown in Figure 3. This last bottle still prevents leftward swinging movement of the arm or pad 80 and thus serves to keep the blocking tongue 74 in the next magazine to the right in an ele-

vated position preventing the feeding of bottles from the next magazine into the hopper. But when the last bottle has been fed from the magazine on the extreme left into the hopper A, the pad or arm 80 is permitted to swing to the left, so that the weight of the bottles in the second magazine from the left, acting on the free end 76 of the blocking tongue 74, will depress the levers 68, rotate the shaft 64 counterclockwise, swing the arms 62 to the left against the cam surface 56a of the lever 56 which is thereby swung into an approximately horizontal position while the shaft 52 is rocked counterclockwise to pivot the arm or plate 54 counterclockwise into a position generally parallel with the plane of the hopper A. Further movement of the plate 54 is prevented, in the case of the extreme left end magazine, by stop member 84 on the outside of the next to the last left hand tongue 36 which stop serves to arrest further counterclockwise movement of the left arm of the lever 56. The lugs 60 on the levers 56 serve to prevent the wires 66 on the arms 62 from slipping off the cam surface 56a. Thus, as shown in Figure 4, the bottles from the next to the last left hand magazine C are permitted to enter the hopper A. The other magazines are still blocked off but when the second magazine from the left has been emptied, the remaining magazines may be discharged, one by one, into the hopper A, in the manner described hereinabove, except that excessive counterclockwise movement of the plates or arms 54 is prevented by the seating of the free ends of the arms 54 on the shaft 52 to the left thereof. Further, in this position, the wires 66 lock the levers 56, the shafts 52 and the plates 54 against clockwise movement, for instance, under the influence of the gravity of bottles in the hopper A and in a magazine further to the right being emptied.

When the machine has been completely emptied, it can be reset for reloading by simply swinging the arms 62 into upright position. Then the blocking tongues 74 are again raised and the impact of the wires 66 against the lugs or ears 58 on the levers 56 causes the latter to assume an upright position, along with the plates 54, the pads 80 being momentarily swung upwardly by the plate 54. The levers 56 retain an upright position, for their right arms are weighted by the ears 58, and the weight of the pads 80 likewise restrains counterclockwise movement of the arms or plates 54.

One of the important features of the present invention is the provision of a single delivery or feeding means for dispensing bottles of various widths fed into the inclined hopper from all of the magazines. Mounted adjacent and in registration with the lower end of the hopper A is a feeding mechanism comprising an upper pair of feeding elements 86 rigidly mounted on a horizontal shaft 88 journaled in the legs of the U-shaped frame member 24 together with a lower pair of feeding elements 90 rigidly mounted on a horizontal shaft 92 also journaled in the legs of the U-shaped frame member 24. The feeding elements 86 and 90 are in the form of four-pointed stars, with the surface intermediate the respective points being of arcuate formation corresponding approximately to the curved contour of the body portion of the widest bottles to be dispensed. Each feeding element of each pair of feeding elements is spaced from the other member of the same pair transversely and located at a position within the ends of the body portion of the bottles. The two pairs of feeding elements are spaced from each other so that the arcuate portions thereof can accommodate therebetween the body portions of the widest bottles to be dispensed while the points thereof will not permit passage therebetween of the body portion of the narrowest bottles to be dispensed. It should be understood, in this connection, that the feeding elements of the two pairs are so adjusted peripherally that on rotation thereof the points of one pair will be aligned with the points of the other pair. As shown, the shaft 92 may be disposed below the discharge ends of the rods 28 and 30 and the shaft 88 may be disposed above the discharge ends of these two rods.

Mounted on the rear end of the shaft 88 beyond the U-shaped frame 24 is a gear wheel or pinion 94 meshing with a similarly disposed gear wheel or pinion 96 on the shaft 90. The gear wheel 94 may be driven, through a driving gear 98, by a worm gear speed reducing mechanism 100. Said mechanism 100 is connected to and driven by an electric motor 102 mounted on the back leg of the frame 24. The motor is caused to be driven each time a coin of the proper denomination is inserted into the control mechanism 14, by virtue of which the feeder elements 86 and 90 are caused to rotate a predetermined amount and feed a bottle forwardly from the position shown in Figures 3 and 4 of the drawings, for discharging the same onto a tiltable delivery tray 104. As seen in Figure 6 of the drawings, a bottle is shown in the process of being dispensed. The tiltable delivery tray 104 has a pair of lateral depending flanges 106 journaled on a pin 108 secured in the closed end portion of the U-shaped frame 24. The tiltable tray 104 is biased to a horizontal position by means disclosed hereinbelow. When a bottle is discharged onto the delivery tray, due to the major portion of the weight of the bottle being to the right of the pivot pin, as shown in Figure 7 of the drawings, in broken lines, the delivery tray tilts to an inclined position and abuts against a stop member 110 projecting from the closed side of the U-shaped frame 24. When the delivery tray is in the inclined position, it constitutes a chute and the bottle slides down the inclined surface of the tray through a dispensing door 112 in the U-shaped frame 24 and through another dispensing door 114 in one of the doors 12 of the cabinet. The opening through the cabinet is defined by a tubular sleeve 116 and the outer end of said door 114 is provided with a closure element 118 pivotally mounted at 120 adjacent its lower end, as seen in Figure 7, so that the base end of the bottle being discharged from the tiltable tray abuts the closure element 118 and moves it to an outwardly and downwardly inclined position. The closure 118 in this position constitutes an extension of the tray in tilted position. The upper end of the closure element is of curved constructed and its marginal edge is inturned to form a flange 122 which constitutes a stop against which the base or bottom of the bottle abuts, to arrest the bottle in a convenient position for access to the purchaser. Mounted on the inner face of the closure 118, below the pivot 120, are counterweights 124 which, when the bottle is removed from the closure in its inclined position, causes the closure to return to an upright position, closing the dispensing opening 114 through the door 12, thereby reducing to a minimum the amount of external air that may enter the refrigerated chamber of the cabinet. As a bottle slides off the tiltable tray, the

latter, being biased to a normally horizontal position, again assumes this position, shown in Figure 7 in full lines.

Mounted on the underside of the tiltable tray at its rearward end is a mercury tube switch 126 which may form the biasing means for normally holding the tiltable tray 104 in horizontal position. This switch is connected in the electrical circuit of the control mechanism 14, and when the tiltable tray moves to the tilted position shown in Figure 7 in broken lines, this switch opens the control circuit which in turn breaks the circuit to the motor 102. Another mercury switch 128 is connected in the electrical control circuit. This second switch is actuated by an arm 132, the free end of which is depressed by a bottle at the lower end of the hopper A to keep the switch in closed position. Suitable spring means or the like are provided operative to lift the arm 132 so as to open switch 128 when the last bottle has been dispensed from the machine. A third manually operated switch 134 is mounted on a depending plate 130 for use in adjusting the machine, for instance, to allow the machine to dispense two or more bottles to insure that the first remaining bottle is properly placed against the dispensing wheels 86 and 90 and on the arm 132.

It will be understood that each time the coin controlled mechanism is actuated, upon the insertion of a coin of the proper denomination, the feeder wheels 86 and 90 rotate one-quarter revolution. As one set of points on the feeder wheels move forwardly to effect dispensing of the first bottle at the lower end of the hopper, the next set of points on the feeder elements move to a position to engage the next bottle being fed down the hopper, thereby serving to hold said bottle and all the others therebehind in place in the hopper or magazine, under control of movement of the feeding elements. Thus there is always a tendency for the force of gravity, acting on the bottles in the hopper or in the magazines, to cause the first bottle at the lower end of the hopper to exert a substantial force on the feeding elements tending to rotate the same. By virtue of the control of the feeding elements, consisting of the motor 102 and worm gear speed reducing mechanism 100, said feeding elements are accurately controlled so that they may rotate only when the motor 102 is energized and cannot be overdriven beyond the speed of the motor because of the reactive force transmitted by the worm gearing driven by the motor. Thus the motor and worm gearing in effect do not constitute a power drive for effecting a dispensing of the bottles under the forces of gravity acting on the bottles in the hopper and magazines. It may be said that the motor and gear drive function as a brake; i. e., when the motor circuit is broken, the worm gearing prevents rotation of the feeder elements 86 and 90 by the forces of gravity acting on the bottles in the hopper and magazines. Hence, when the motor is energized, the worm gear drive controls the speed of movement of the feeder elements upon which the gravity forces of the bottles operate and tend to rotate them for effecting dispensing of the bottles. Thus the motor control, including the worm gearing, makes it possible to employ the same dispensing mechanism in connection with vending machines for the dispensing of various size bottles and other articles. Since the motor and drive mechanism merely function as a control, and not as a positive feeding device, it is possible to utilize an extremely small powered motor.

Although I have shown and described a preferred embodiment of my invention, manifestly it is capable of substantial modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise embodiment herein disclosed, except as I may be so limited by the appended claims.

I claim as my invention:

1. In combination with a series of upwardly extending laterally intercommunicating magazines adapted to contain stacks of superimposed articles, an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under influence of gravity, means for releasing articles from said hopper, means for successively discharging the contents of said magazines into said hopper starting with the magazine closest to the discharge end of said hopper, said discharge means comprising vertically movable means in the bottom of said hopper for each magazine except the first magazine capable in raised position of receiving the gravity thrust of the contents of said magazine and to block feeding movement down into said hopper but movable under the influence of the weight of said magazine contents into lowered position permitting such feeding movement into said hopper, a release member for each magazine except the first magazine swingable into the next preceding magazine only when the latter magazine is empty, a shaft rigidly connected to said blocking means for rocking thereby on movement of said blocking means from raised position into lowered position, and lever means for translating the rocking force transmitted to said shaft into pressure on said release member to keep said blocking member from moving from raised position into lowered position until the next preceding magazine has been emptied.

2. In combination with a series of upwardly extending laterally intercommunicating magazines adapted to contain stacks of superimposed articles, an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under influence of gravity, means for releasing articles from said hopper, means for successively discharging the contents of said magazines into said hopper starting with the magazine closest to the discharge end of said hopper, said discharge means comprising vertically movable means in the bottom of said hopper for each magazine except the first magazine capable in raised position of receiving the gravity thrust of the contents of said magazine and to block feeding movement down into said hopper but movable under the influence of the weight of said magazine contents into lowered position permitting such feeding movement into said hopper, a release member for each magazine except the first magazine swingable into the next preceding magazine only when the latter magazine is empty, a shaft rigidly connected to said blocking means for rocking thereby on movement of said blocking means from raised position into lowered position, an arm rigidly connected to said shaft, and a rigid member movable by said arm against said release member under the influence of the weight of said magazine contents as translated by said blocking means, said shaft and said arm, so as to urge said release member to swinging movement into the next preceding magazine whereby movement of said blocking member from raised position into lowered posi-

tion is prevented until the next preceding magazine has been emptied.

3. In a gravity feed article vending machine for dispensing a unit number of articles incident to actuation of coin controlled mechanism under insertion of a coin, the combination of a series of upwardly extending laterally intercommunicating magazines adapted to contain stacks of superimposed articles, an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under influence of gravity, said hopper having a discharge end adjacent the lower end thereof, toward which articles in the hopper move under influence of gravity, delivery means mounted in registration with the discharge end of the hopper in a position to normally hold the articles in the hopper in opposition to the gravity pressure exerted by said articles, power driven means for controlling the delivery means in response to actuation of the coin controlled mechanism, whereby said delivery means effects a dispensing of a unit number of articles from the hopper upon each actuation, and means for successively discharging the contents of said magazines into said hopper starting with the magazine closest to the discharge end of said hopper, said discharge means comprising means for each magazine except the first magazine capable in a first position of receiving the gravity thrust of the contents of said magazine and to block feeding movement down into said hopper but movable under the influence of the weight of said magazine contents into a second position permitting such feeding movement into said hopper, a release member for each magazine except the first magazine swingable into the next preceding magazine only when the latter magazine is empty, a shaft rigidly connected to said blocking means for rocking thereby on movement of said blocking means from said first position into said second position, an arm rigidly connected to said shaft, a second shaft having a lever connected thereto in a position such that said arm can actuate said lever to rock said second shaft, and a member rigidly connected to said second shaft movable thereby against said release member under the influence of the weight of said magazine contents as translated by said blocking means, said first shaft, said arm, said second shaft and said lever so as to urge said release member to swinging movement into the next preceding magazine whereby movement of said blocking member from said first position into said second position is prevented until the next preceding magazine has been emptied.

4. In a gravity feed article vending machine for dispensing a unit number of articles incident to actuation of coin controlled mechanism upon insertion of a coin, the combination of a series of upwardly extending laterally intercommunicating magazines adapted to contain stacks of superimposed articles, an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under influence of gravity, said hopper having a discharge end adjacent the lower end thereof, toward which articles in the hopper move under influence of gravity, delivery means mounted in registration with the discharge end of the hopper in a position to normally hold the articles in the hopper in opposition to the gravity pressure exerted by said articles, power driven means for controlling the delivery means in response to actuation of the coin controlled mechanism, whereby said delivery means effects a dispensing of a unit number of articles from the hopper upon each actuation, and means for successively discharging the contents of said magazines into said hopper starting with the magazine closest to the discharge end of said hopper, said discharge means comprising a pivotable blocking member for each magazine except the first magazine, capable when pivoted to an elevated position of receiving the gravity thrust of the contents of said magazine and of blocking feeding from said magazine down into said hopper and when pivoted to a lowered position permitting such feeding movement, a first rock shaft, lever means rigidly connected to said rock shaft capable of elevating said blocking means, an arm on said rock shaft, a second rock shaft, a lever on said second rock shaft capable of being acted upon by said arm to rock said second shaft, a projecting member on said second rock shaft within said magazine capable of swinging movement into the next preceding magazine, a suspended release member capable of swinging movement into the next preceding magazine ahead of said projecting member but only when the next preceding magazine is empty, said projecting member being capable of urging said release member into such swinging movement, and stop means for limiting swinging movement of said projecting member into the next preceding magazine so that said projecting member after such swinging movement will block upward feeding from said hopper into the next preceding magazine, said second rock shafts functioning as such stop means except in the first magazine.

5. In combination with a series of upwardly extending laterally intercommunicating magazines adapted to contain stacks of superimposed articles and an inclined hopper in open communication with the bottom of each magazine for receiving articles therefrom under the influence of gravity, means for releasing articles from said hopper, means for successively discharging the contents of said magazines into said hopper starting with the magazine at the lowest end of said hopper, said discharge means comprising vertically movable means in the bottom of said hopper for each magazine except the first magazine capable in raised position of receiving the gravity thrust of the contents of said magazine and to block feeding movement down into said hopper but movable under the influence of the weight of said magazine contents into lowered position permitting such feeding movement into said hopper, a release member for each magazine except the first magazine swingable into the next preceding magazine only when the latter magazine is empty, and separate means for transmitting the gravity thrust from each blocking means to said release member to keep said blocking member from moving from raised position into lowered position until the next preceding magazine has been emptied.

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