Nov. 28, 1950 C. W. HALL 2,532,062

VENDING MACHINE

Filed April 10, 1945 4 Sheets-Sheet 1

Fig. 1.

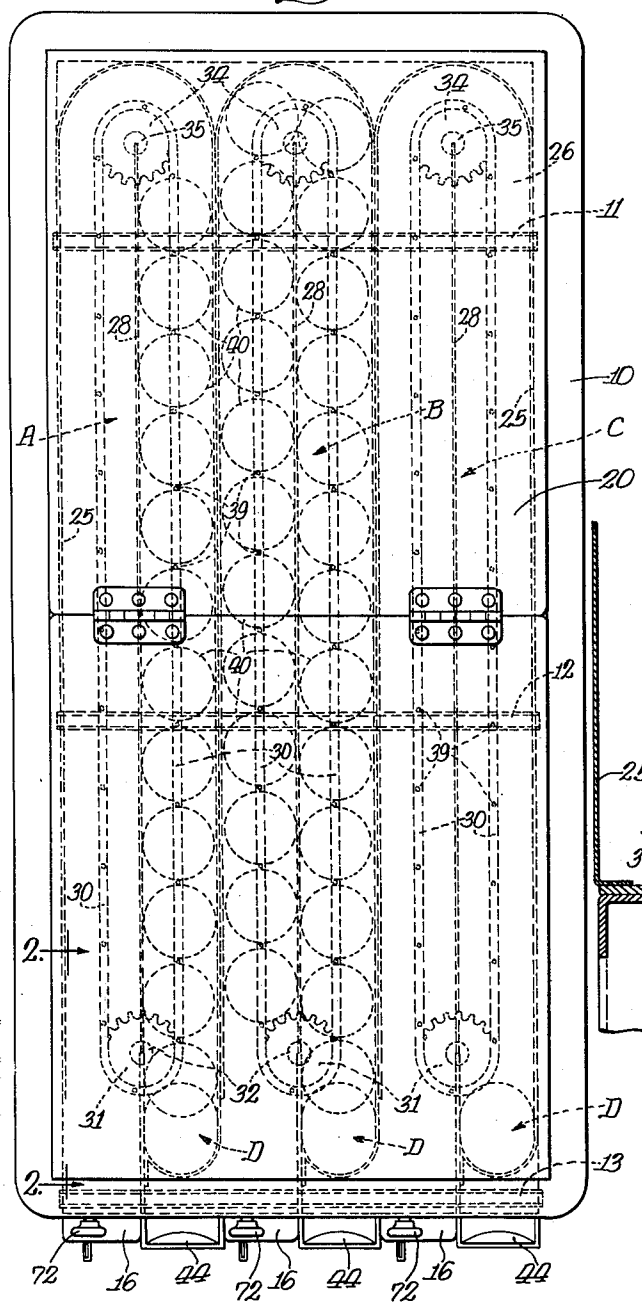
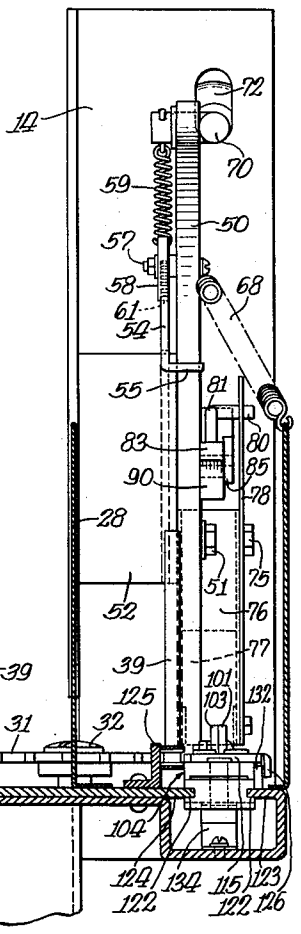


Fig. 7.



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Fig. 2.

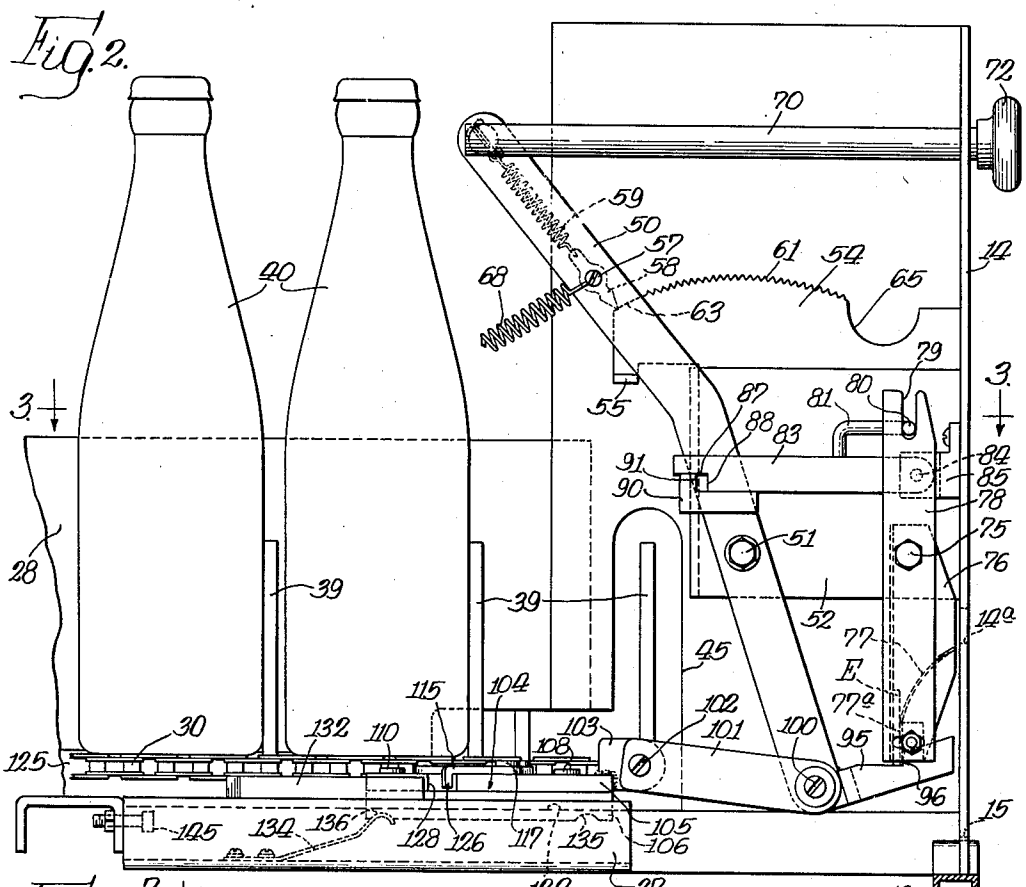
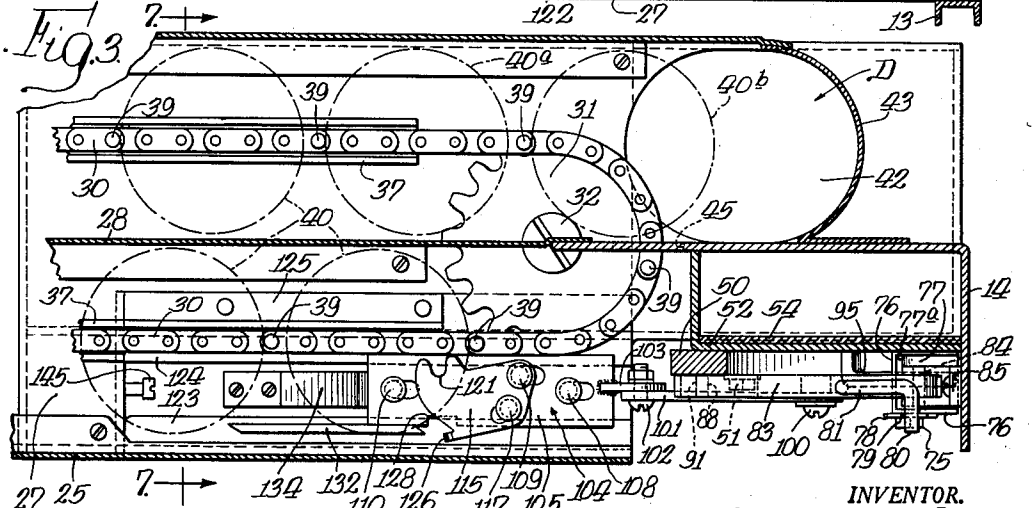


Fig. 3.



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Fig. 4.

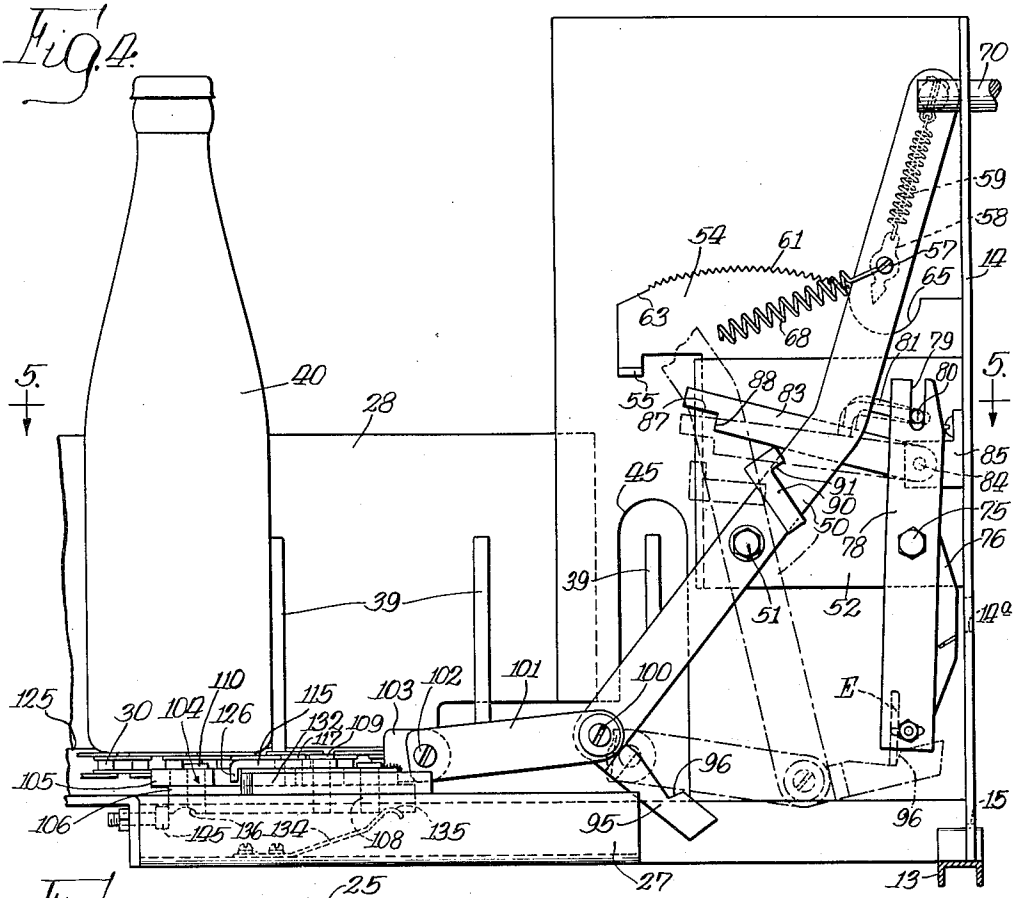


Fig. 5.

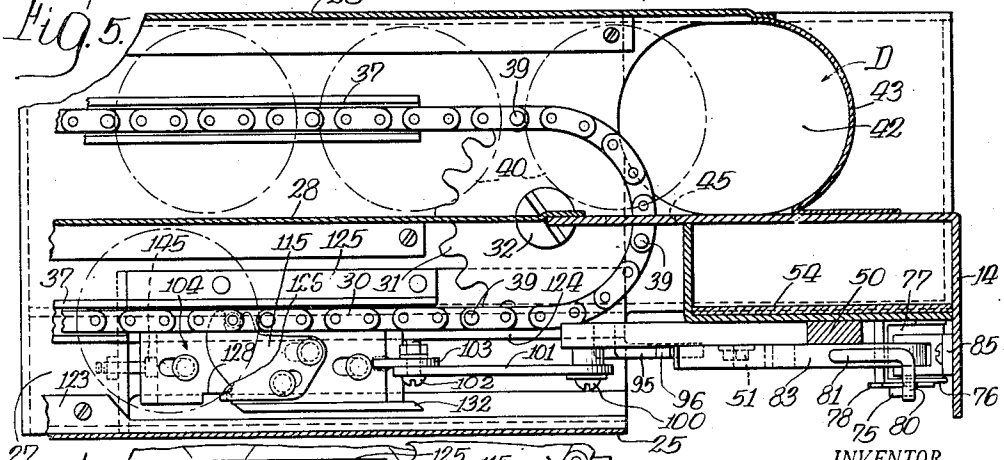
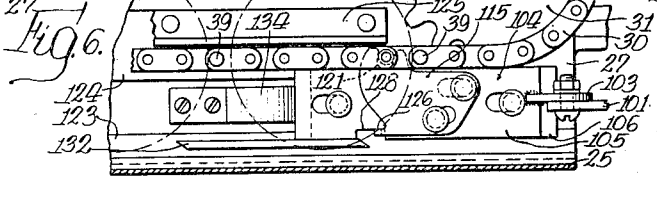


Fig. 6.



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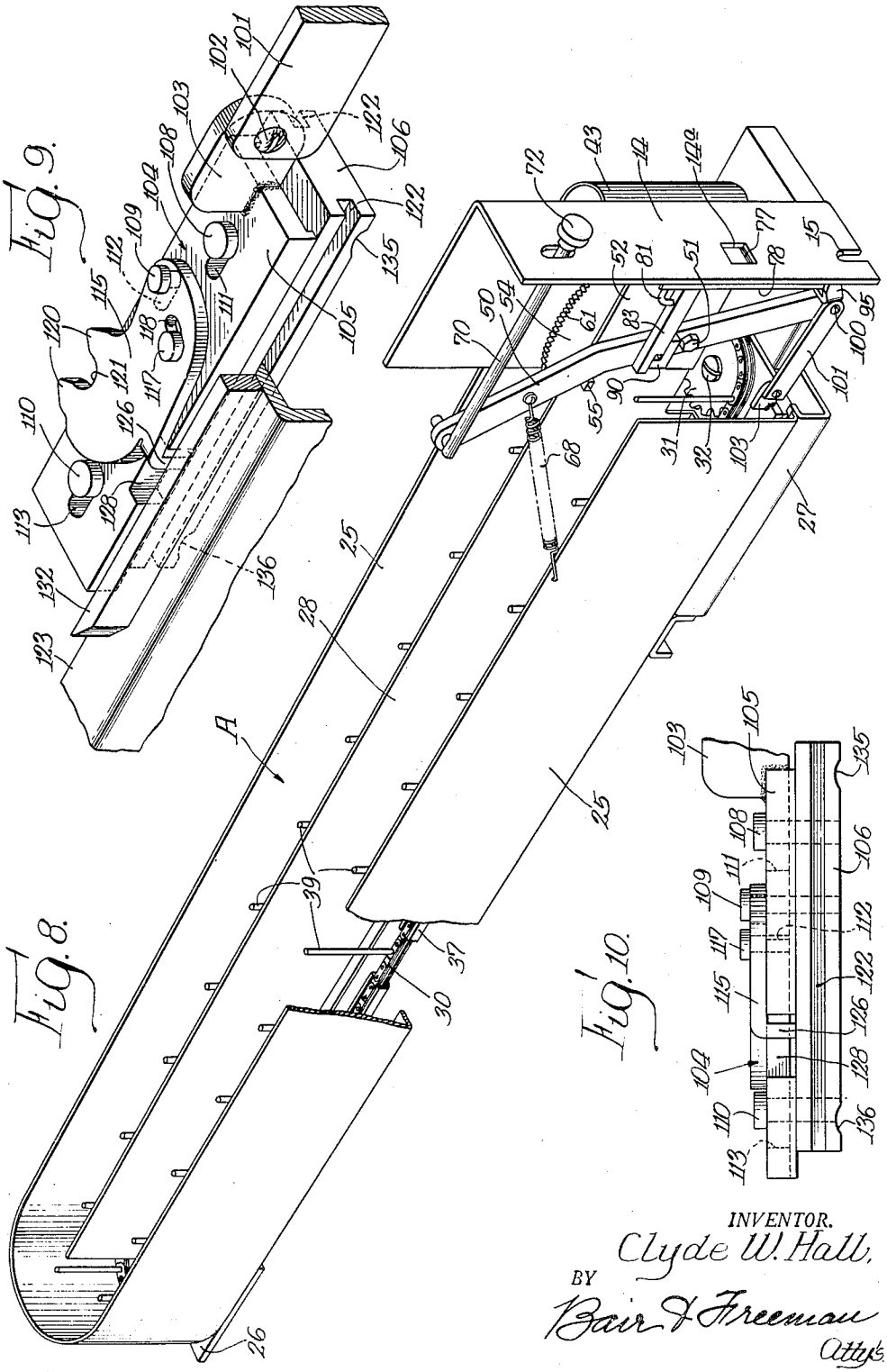


Fig. 9.

Fig. 8.

Fig. 10.

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Patented Nov. 28, 1950 2,532,062

UNITED STATES PATENT OFFICE

2,532,062

VENDING MACHINE

Clyde W. Hall, Chicago, Ill., assignor, by mesne assignments, to F. H. Knowles

Application April 10, 1945, Serial No. 587,574

8 Claims. (Cl. 312—97)

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This invention relates to an article vending machine of the manually actuated, coin controlled type, for delivering, in response to each operation, a unit number of articles, usually one, such as by way of illustration and not limitation, a bottle of beverage. The present invention is adapted to machines of the general type having an endless conveyor, provided with a plurality of uniformly spaced apart article engaging elements for impelling articles to a discharge station disposed along the path of travel of the conveyor, and wherein the machine may be arranged for vending a single kind of article, or may be constructed for selectively vending a plurality of different kinds or character of articles, such as several different flavors of bottled beverage.

One of the objects of this invention is to provide a novel and improved manually actuated mechanism for coin controlled article vending machines of the character indicated, and wherein said mechanism is constructed and arranged to maintain an exact indexed relation to the conveyor for dispensing a unit number of articles incident to each operation.

Another object is to provide an improved actuating mechanism for coin controlled vending machines of the character indicated, wherein said mechanism is constructed and arranged to preclude creeping of the conveyor due to manipulation of the manual operating lever when no coin has been inserted into the machine.

A further object is to provide an improved actuating mechanism for a vending machine of the character indicated, comprising means adapted to be moved into driving relation with the chain of the conveyor incident to movement of a manually operated member through an initial portion of an operating stroke, and adapted to move the conveyor chain an amount equivalent to the spacing of the article engaging elements upon completion of the operating stroke, and adapted to be disengaged from the conveyor chain immediately upon commencement of the return stroke of the operating member.

Still another object is to provide a unitary, self-contained assembly adapted to be removably mounted in a vending machine casing and comprising a frame structure, a conveyor and coin controlled manually actuated mechanism for moving the conveyor a stepped amount to dispense an article or unit number of articles each time said mechanism is operated incident to the insertion of a coin.

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Still another object is to provide an improved vending machine characterized by the provision of a casing and a plurality of independent, unitary, self-contained, individually operated assemblies adapted to be removably mounted in the casing so as to permit quick and easy removal for repair or replacement of an assembly without interfering with the operation of the other unitary assemblies.

A still further object is to provide a novel and improved coin controlled mechanism for a vending machine of the character indicated which is simple in construction, durable in use and which is relatively inexpensive to manufacture.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying darwings, in which:

Figure 1 is a top view of a vending machine provided with a plurality of independent, unitary assemblies embodying the present invention;

Figure 2 is an enlarged, vertical, sectional view at the forward end of one of the unitary assemblies and showing my novel coin controlled mechanism, and taken substantially as indicated at line 2—2 on Figure 1;

Figure 3 is an enlarged, horizontal sectional view taken substantially as indicated at line 3—3 on Figure 2;

Figure 4 is an enlarged view similar to Figure 2 and showing the coin controlled mechanism in a condition of adjustment after completion of the operating stroke for effecting dispensing of an article from the conveyor;

Figure 5 is a horizontal, sectional view somewhat similar to Figure 3 showing the parts of the mechanism in a position of adjustment corresponding to Figure 4, and taken substantially as indicated at line 5—5 on Figure 4;

Figure 6 is a fragmentary plan view of a portion of the conveyor chain and indexing and driving means, corresponding to a position assumed when the manually operated lever has been moved through an initial portion of its operating stroke;

Figure 7 is a vertical, sectional view through the forward end of the unitary assembly, and taken substantially as indicated at line 7—7 on Figure 3;

Figure 8 is a perspective view of a unitary assembly including a frame, a conveyor and coin

controlled mechanism and embodying the present invention;

Figure 9 is a perspective view of the conveyor chain indexing and driving means, including a carrier and movable pawl assembly; and

Figure 10 is a side elevational view of the carrier and pawl assembly.

The vending machine represented in the drawings is constructed to operate in a manner which may be termed semi-automatic, and depends partly upon manual operation by the purchaser to cause delivery of the article purchased from the conveyor to a discharge station, and the completion of the delivery being dependent upon the action of gravity.

As represented in the drawings, the machine includes a housing or casing 10, which, dependent upon the nature of the articles to be dispensed, may or may not include insulated walls. If the commodity being vended requires storage in a refrigerated condition, the cabinet obviously is provided with insulated walls and suitable refrigerating apparatus would be associated therewith. As may be seen in Figure 1 of the drawings, the casing is dimensioned and arranged for accommodating therein three separate self-contained, unitary assemblies as indicated at A, B and C, respectively, and it is to be understood that these unitary assemblies are identical in size, construction and operation. Said assemblies are adapted to be individually and removably mounted in the cabinet 10, preferably in side by side relation for compactness of arrangement. Said assemblies are adapted to be supported upon transversely extending members 11, 12 and 13 in said casing 10, to which said assemblies may be secured, such as by means of bolts or screws. The forward portion of each of the assmblies includes an upright frame member 14, the lower end of which is provided with a notch 15 for seating upon a suitably formed member located on the inner surface of the front wall of the casing 10 for properly positioning each of said assemblies with respect to separate coin operated mechanisms indicated generally at 16, mounted on the front wall of the casing, in alignment with the respective unitary assemblies. It is to be understood that the coin mechanisms 16 which do not constitute a direct part of the present invention, are of conventional form, not shown herein in detail, constructed and arranged with usual means for selecting coins of a proper denomination from other coins and from slugs.

The casing 10 is provided with a top 20, which serves as a closure for the upper end of the casing and covers all three of the unitary assemblies. It is to be understood that suitable latch means, preferably lock controlled, is associated with the cover and the casing to preclude unauthorized access to the articles in the respective unitary assemblies.

Each of the unitary self-contained assemblies includes an upright, elongated U-shaped sheet metal frame member 25, rigidly mounted at its rear end on a horizontal plate 26, and rigidly secured at its forward end to a horizontally disposed base member 27. Disposed centrally within the U-shape member 25 is a partition plate 28, rigidly mounted at opposite ends on the plate 26 and base 27, respectively, and serving to divide the space within the U-shape frame into two elongated passageways through which travel the respective runs of an endless conveyor. The inner surfaces of the frame member 25 and the partition plate 28 serve as guides and confine articles on the conveyor, as may be seen in the drawings. The endless conveyor includes an endless strand of roller chain 30, trained around a horizontally disposed driving sprocket wheel 31, journalled on the base member 27 by means of a threaded stud shaft 32, as clearly seen in Figures 7 and 8 of the drawings. The opposite end of the chain is trained around a horizontally disposed idler sprocket wheel 34, journalled on the mounting plate 26 by a threaded stud shaft 35, similar to the stud shaft 32. The respective runs of the endless conveyor chain, intermediate the horizontally disposed sprocket wheels 31 and 34, are supported and guided in upwardly facing U-shaped channels 37, rigidly attached at opposite ends to the rear plate 26 and base 27.

Extending upwardly from the chain 30 are a plurality of uniformly spaced apart, article engaging elements 39 in the form of pins, as clearly seen in Figure 4 of the drawings, which serve to space articles such as bottles, as indicated at 40, uniformly along the chain, and serve to impel the bottles by means of coin controlled, manually operated mechanism hereinafter described. The manually operated mechanism is adapted to be actuated after the feeding of a coin thereto from the coin mechanism 16, for advancing the conveyor a stepped amount, equal to the spacing of the pins 39 of the conveyor chain. By such movement of the conveyor the bottles 40 are advanced with the conveyor, so as to feed a bottle from the position indicated in dot and dash outline at 40a to the dot and dash position indicated at 40b in Figure 3 of the drawings, or slightly beyond the latter position, at which position the bottle is caused to drop by gravity at the discharge station indicated generally at D. The discharge station includes an opening 42 surrounded by a curved upright wall 43 at the forward end, so that the bottle is caused to drop by gravity through the opening 42, and is caused to move by gravity in a downward direction through a chute to the trough-like dispensing station, as indicated at 44 at the front end of the machine, where the bottle is then accessible to the purchaser. Suitable means, not shown, may be provided at said discharge station for yieldingly engaging the bottle as it discharges from the conveyor chain. When the vending machine is utilized for dispensing refrigerated articles, a suitable form of normally closed trap door construction may be associated with the opening 42, and said door being caused to be opened by the weight of the bottle as it is dislodged from the conveyor chain at the discharge station.

It will be noted that the upright frame member 14 is of L-shape formation as may be clearly seen in Figure 3 of the drawings, and is provided with a vertical, elongated slot, or opening 45, (Figure 2) to provide clearance for the passage of the upstanding pins 39 as they travel with the conveyor chain around the driving sprocket wheel 31 from the dispensing run of the conveyor to the storage run thereof. It will be noted that at the opposite or rear end of the assembly, the partition member 28 terminates in spaced apart relation to the end of the upright frame 25, so as to permit free unobstructed passage of the chains and their upstanding pins 39 together with bottles 40 carried thereon, while moving from the storage run to the dispensing run of the conveyor.

The coin controlled, manually actuated mechanism above referred to comprises a main op-

erating lever 50, pivotally mounted at 51 on a bracket 52, rigidly attached, as by welding, to the upright frame member 14. Mounted against the inner surface of the bracket member 52, as may be seen in Figures 2 and 3 of the drawings, is a ratchet segment 54 having at one end a laterally projecting lug 55 serving as a stop to limit the rearward movement of the operating lever 50. Pivotally mounted at 57 on the operating lever is a ratchet dog 58, normally yieldingly maintained in the aligned position, as seen in Figure 2 of the drawings by means of a coil spring 59 attached to the upper end of the lever 50. The ratchet segment is provided with a multiplicity of teeth as indicated at 61 and the rear end thereof has a portion, as indicated at 63, of reduced dimensions to provide clearance for the ratchet dog 58 and by virtue of which said operating lever is free to move an angular amount, corresponding to the angular extent of said portion 63, before said dog 58 is caused to engage the teeth 61 of the segment. It will be understood that as the lever moves forwardly from the position seen in Figure 2, the dog 58 engages the teeth in a manner so as to preclude backward movement of the lever and thus insures that the lever may only move forwardly to complete ratcheting action over the entire series of teeth 61. At the forward end of the toothed portion of the segment member 54 is a clearancce opening 65 into which the dog moves when the lever 50 arrives at the forward limit of its operating stroke, at which position the dog 58 is permitted to again assume the aligned relation with respect to the lever as seen in Figure 2. Thus upon rearward movement of the operating lever, the dog 58 operates in a reverse direction with respect to the teeth 61 so as to preclude forward movement of the operating lever during an intermediate portion of the return stroke thereof, and thus insures that said lever must move through its entire return stroke after such stroke has been commenced. To assist in returning the lever 50 to its normal, inoperative position in abutting relation to lug 55, I provide a coil spring 68, connected at one end to said lever and the opposite end being connected to the U-shape frame member 25, as may be seen in the drawings. The small amount of free movement of the operating lever 50 in a forward and rearward direction without the insertion of a coin into the mechanism, by reason of the clearance portion 63 of the rack segment, provides a lost motion connection, which has an important function, as will hereinafter be particularly pointed out. For convenience in operating the lever 50, I provide a rod 70, pivotally connected at its rear end to the upper end of the lever 50, with the forward end of the rod projecting through the front wall of the frame member 14 and through the outer wall of the cabinet 10, and provided at its outer end with a hand engaging knob 72. It is to be understood that when the wall of the cabinet is constructed in insulated form, the rod 70 is of somewhat greater length for accommodating the additional thickness of the wall.

Pivotally mounted at 75 on the bracket member 52 is a vertically extending coin receiving receptacle 76 of U-shape in cross section as may be seen in Figure 3 of the drawings, having an arcuate guide plate 77 positioned therein in fixed relation to the walls of said receptacle so as to define a guide slot 77a for receiving a

coin in edgewise relation, as indicated in dotted outline at E in Figure 2 of the drawings. Connected rigidly to the outer wall of the coin receptacle 76 is an upwardly extending lever arm 78, the upper end of which is formed with a vertically extending elongated slot 79 in which is seated a laterally extending leg 89 of a control member 81, rigidly attached to a locking arm 83, which is pivotally mounted at 84 in a U-shape bracket 85 attached to the front portion of the upright frame member 14. The rear end of the locking arm is notched to provide a supporting surface 87, and an abutting surface 88 which cooperates with a locking stop 90 of modified L-shaped formation, rigidly mounted on the outer surface of the operating lever 50. The upper end of the lock stop is adapted to be engaged by the supporting surface 87 of the free end of the locking arm 83 and the inner upright surface 91 is adapted to cooperate with the abutting surface 88 of said locking arm. As may be noted in Figure 2, the cooperating surfaces 88 of the locking arm and 91 of the lock stop are spaced apart a short distance to provide a lost motion connection, as above referred to, and which permits a limited amount of forward movement of the operating lever 50, and when said surfaces 88 and 91 are in abutting relation the lever is arrested at a position with the ratchet dog 58 still in alignment with the clearance portion 63 of the segment rack 54, out of engagement with the teeth 61.

Rigidly connected to the lower end of the operating lever 50 is a forwardly and slightly upwardly inclined member 95 extending below the coin guideway 77a of the coin receptacle 76. Said member 95 is provided with an abutment shoulder 96 adapted to cooperate with coin E when in place in the coin guideway 77a for effecting a rocking movement of the locking arm 83 out of blocking relation to the lock stop 90, as clearly seen in dot and dash outline in Figure 4 of the drawings. It is to be understood that the member 95 is dimensioned and so related to the lower end of the coin receptacle 76 as to be out of engagement therewith during the lost motion movement of the operating lever 50 as above described. When a coin E is in position in the guideway 77a, resting on the member 95, and said operating lever is actuated by an outward pull of the rod 70, the above referred to lost motion movement of the operating lever, or which may be termed the initial portion of the operating stroke of said lever, causes the abutment shoulder 96 of the member 95 to engage the coin E. Further or continued movement of the lever 50 through its entire operating stroke is permitted because the movement of said abutment shoulder is then transmitted through the coin to cause the receptacle 76 and the lever arm 78 to swing about the pivot 75 and thereby transmit movement through the member 81 for raising the locking arm 83 to the dot and dash position indicated in Figure 4 of the drawings, out of blocking relation to the lock stop 90. The action of the mechanism is such that when a coin of proper denomination is fed from the coin mechanism 16, it immediately passes through an opening indicated at 14a in the front wall of the frame member 14, and is directed into the guideway 77a, and said operating lever 50, through the medium of the rod 70, may be continuously moved through its entire operating stroke from the position seen in Figure 2 of the drawings to the position seen in Figure 4 of the drawings, for dispensing an article or unit

of articles by actuation of the conveyor as will be presently described. During such movement the coin is permitted to move through the guideway 77a and drop off of the member 95 into a suitable cash box (not shown) positioned therebelow.

Pivotally connected at 100 to the lower end of the operating lever 50 is a link 101, the rear end of which is pivotally connected at 102 to a lug 103 attached to a carrier indicated generally at 104. The carrier is adapted to be reciprocably moved in close relation to the strand of the roller chain 30 on the storage run side of the conveyor, as may be seen in the drawings, incident to the movement of the operating lever through its operating and return strokes. The carrier is composed of two elongated members 105 and 106 mounted one on top of the other and interconnected together for lost motion movement by pins 108, 109 and 110 projecting upwardly from the bottom carrier member 106 into elongated slots 111, 112 and 113, respectively, in the top carrier member 105. By virtue of said connection of the two members, the top member 105 is capable of having a limited amount of longitudinal movement with respect to the carrier member 106. As may be seen in Figure 9 of the drawings, the lug 103 to which the link member 101 is pivotally attached is rigidly connected to the upper carrier member 105. Mounted flatly against the upper surface of the top carrier member 105 is a pawl 115 pivotally mounted with respect to said member 105 by the head of the pin 109. Projecting upwardly from the upper carrier member 105 is a pin 117 extending through an elongated slot 118 in said pawl and by virtue of which said pawl is caused to pivot about the axis of the pin 109 incident to longitudinal movement of the carrier member 105 relative to the carrier member 106. Said pawl includes a pair of laterally projecting teeth 120 joined by a socket portion 121 and formed for embracing engagement of a roller of the conveyor chain 30.

The carrier is guided during its limited reciprocable movement by means of a pair of guideways 122 formed in the opposite marginal edges thereof of the member 106 seated in cooperating relation on tracks 123 and 124, as may be seen in Figure 7 of the drawings. The track 123 is formed by an inturned flange of the base member 27 and the track member 124 is rigidly attached to the base member 27 as may be seen in the drawings. The portion of said conveyor chain, through the range of movement of the carrier, and beyond the end of guide support 37, is guided and supported by an upstanding leg of an angle iron guide element 125.

Normally in the inoperative position of the coin control mechanism, the pawl 115 assumes the position as seen in Figures 2 and 3 of the drawings, and when movement is imparted through link member 101 to first effect relative movement of the upper carrier member 105 with respect to carrier member 106, said pawl is moved laterally in an inward direction as seen in Figures 6 and 9, into engagement with the roller conveyor chain 30. To limit such inward movement of the pawl, said pawl is provided with a downwardly extending lug 126 adapted to engage an abutting surface 128 of a notched portion of the outer edge of the upper carrier member 105.

It is to be understood that during the initial portion of movement of the operating lever within the range of the lost motion connection as permitted by the space between the surface 88 of the locking arm 83 and abutting surface 91 of the lock stop 90, motion is imparted by the operating lever through the link 101 to shift the upper carrier member 105 relatively to the lower member 106, as may be seen in Figures 6 and 9 of the drawings so as to cause the pawl 115 to move into operative engagement with the conveyor chain.

A guide track or locking rail 132 is mounted on the base 27 adjacent the supporting track 123 for the carrier, as may be clearly seen in Figures 3, 5, 6 and 7 of the drawings, for cooperative action with the lug 126 of the pawl. The locking rail has opposite ends inclined to facilitate guiding the lug 126 in a manner to cause movement of the pawl inwardly or outwardly with respect to the conveyor chain, incident to rearward and forward movement of the carrier.

Mounted beneath the carrier is a leaf spring 134 having the outer free end arcuately formed for seating in cooperatively formed arcuate recesses 135 and 136 provided at opposite ends of the under side of the lower carrier member 106. The spring 134 tends to yieldingly maintain the carrier assembly in a restrained position at either limit of longitudinal movement of the carrier assembly, as may be clearly seen in Figures 2 and 4 of the drawings.

As the operating lever 50 moves an initial amount, within the range of lost motion movement as provided for between the locking arm and lock stop, as above described, the link 101 shifts the upper carrier member 105 longitudinally with respect to the lower carrier member 106 from the position seen in Figures 2 and 3 of the drawings, to the position seen in Figure 6 of the drawings. By virtue of such movement of the upper carrier member, the pawl 115 is moved into engagement with the roller chain 30 of the conveyor at which position the lug 126 is positioned inwardly of the inner surface of the locking rail 132, so that upon further movement of the operating lever, which is permitted as a result of movement thereof through the balance of the operating stroke, incident to the feeding of the coin to the coin control mechanism as above described, the carrier assembly is moved longitudinally to the position seen in Figure 5 of the drawings, thereby moving the conveyor chain a stepped amount, equivalent to the spacing between a pair of adjacent upstanding pins 39 for dispensing a bottle 40 at the discharge station D. As the carrier travels through said last mentioned movement, the pawl 115 is confined in chain engaging position by means of the locking rail 132 so that movement of the operating lever through the balance of its operating stroke insures indexed movement of the conveyor with respect to the coin controlled mechanism. When the carrier assembly arrives at its rearward limit of movement corresponding to the limit of the operating stroke of the lever 50, the pawl is at a position with its lug 126 disposed beyond the rear end of the locking rail 132, so that upon commencement of the return stroke of the operating lever, motion is immediately transmitted through the link 101 to first move the upper carrier member 105 rearwardly with respect to carrier member 106, thereby causing the pawl 115 to move out of engagement with the conveyor chain 30 and disposing the lug 126 outwardly beyond the locking rail 132 so that during further movement of the operating lever 50 through its return stroke, the locking rail 132 serves to confine the lug 126 at a position to maintain the pawl 115 out of engagement with the chain 30

until the carrier assembly again assumes the position as seen in Figure 3 of the drawings. The spring 134 thus serves to yieldingly retain the lower carrier member 106 in position so as to insure such relative movement of the carrier members during the initial portions of both the operating and return strokes of the lever 50.

To limit the extent of movement of the conveyor chain an exact stepped amount each time that the lever 50 is actuated through an operating stroke, I provide an adjustable stop member 145 mounted on a depending flange portion of the base 27 in a position so as to be abutted by the lower carrier member 106. Said stop member 145 thus serves to limit the movement of the carrier assembly in the direction corresponding to the operating stroke of the lover 50, so as to obtain exact control of and step movement of the conveyor chain for insuring proper dislodgment of an article, such as a bottle, therefrom at the discharge station D. The adjustment of the stop member 145 permits obtaining a variation in the extent of movement of the lever 50, so that chains having elements 39 of different spacings can be utilized for accommodating articles or bottles of beverage of different sizes, while at the same time obtaining proper dislodgment of such articles from the conveyor at the discharge station.

It will therefore be apparent that, by virtue of the construction described, it will be impossible to cause creeping of the conveyor by a series of actuations of the operating lever 50 through the range provided by the lost motion connection between the lever and the lock stop, when no coin has been inserted into the mechanism, because such movement will only result in causing the pawl 115 to move into and out of operative relation to the conveyor chain 30. It will also be apparent that, by virtue of the construction described, it will be impossible for the conveyor to get out of indexed relation with respect to the coin control mechanism even in the event that said mechanism is rapidly actuated so as to cause a relatively fast movement of the carrier assembly for shifting the conveyor chain a stepped amount, because when the carrier assembly arrives at the end of its permissible range of movement and abuts against the stop 145, the pawl 115 is caused to remain in operative relation to the chain 30 until the pawl is moved laterally outward as a result of the initial portion of movement of the operating lever 50 through its return stroke.

By providing a total unitary assembly of frame structure, conveyor and coin controlled mechanism, it is possible to expeditiously and economically produce such unitary structures. Furthermore, great advantages follow as a result thereof in servicing and repairing of vending machines utilizing such unitary structures because it is possible, especially in a machine provided with a plurality of such structures, to quickly and easily remove one of the unitary structures for servings or repairing or for total replacement by another unitary structure, if necessary, without affecting, in any manner, the usefulness and the operation of the other unitary assemblies of the vending machine for dispensing articles in a manner as above described.

Although I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of 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 form herein disclosed, except as I may be so limited by the appended claims.

I claim as my invention:

1. Actuating mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke, chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl pivotally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out of operative engagement with said conveyor chain; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

2. Actuating mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke; chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl piv-

otally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out of operative engagement with said conveyor chain; stop means on the frame positioned to be engaged by said carrier for limiting the movement thereof incident to movement by said lever through its operating stroke, and thereby limiting the step movement of the conveyor in indexed relation to the discharge station for dispensing an article at said discharge station; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

3. Actuating mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke, chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl pivotally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out of operative engagement with said conveyor chain; said pawl having a lug adapted to engage one of the carrier members for limiting the movement of the pawl in the direction of engagement with the chain; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

4. Actuating mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke; chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl pivotally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out of operative engagement with said conveyor chain, said pawl having a lug adapted to engage one of the carrier members for limiting the movement of the pawl in the direction of engagement with the chain, a track adjacent said carrier adapted to cooperate with said lug for confining the pawl in chain engaging position during the movement of the carrier and conveyor incident to movement of the lever through its operating stroke and for confining the pawl out of engagement with the chain upon return movement of the carrier incident to the return stroke of movement of said lever; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

5. Actuation mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke; chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl pivotally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out

of operative engagement with said conveyor chain, said pawl having a lug adapted to engage one of the carrier members for limiting the movement of the pawl in the direction of engagement with the chain, a track adjacent said carrier adapted to cooperate with said lug for confining the pawl in chain engaging position during the movement of the carrier and conveyor incident to movement of the lever through its operating stroke and for confining the pawl out of engagement with the chain upon return movement of the carrier incident to the return stroke of movement of said lever; stop means on the frame positioned to be engaged by the carrier for limiting movement thereof when said manually actuated lever is moved through its operating stroke and thereby limiting movement of the conveyor in indexed relation to the discharge station; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

6. Actuating mechanism for an article vending machine of the type having a frame and an endless conveyor therein adapted to be intermittently operated for advancement one step at a time and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke; chain engaging means operably connected to said lever and normally disposed out of engagement with the chain when said lever is disposed at its starting position, said means being constructed and arranged to move into driving engagement with the chain of the conveyor during the initial portion of the operating stroke of said lever, and upon further movement of said lever to effect movement of said chain an amount substantially equivalent to the distance between adjacent article engaging elements for delivering one article at the discharge station, said chain engaging means including a carrier mounted for guided reciprocating movement in the frame, adjacent the chain and comprising two members interconnected for limited relative longitudinal movement, a link connecting one of said carrier members to the operating lever, and a chain engaging pawl pivotally mounted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl to convert said relative longitudinal movement into lateral swinging movement of said pawl so as to move said pawl laterally into or out of operative engagement with said conveyor chain; said pawl having a lug adapted to engage one of the carrier members for limiting the movement of the pawl in the direction of engagement with the chain; means coacting with the other of said members of the carrier for releasably retaining the carrier at either of its limits of reciprocating movement, whereby to insure said relative movement of the carrier members during the initial portions of both the operating and return strokes of said lever for moving said pawl into and out of engagement respectively, with said conveyor chain; and detent means coacting with said lever during the range of said further movement thereof for precluding return movement of said lever until completion of the operating stroke.

7. Actuating mechanism for an article vending machine of the type having an endless conveyer, comprising, a carrier mounted in the machine for sliding movement longitudinally along the conveyer, said carrier including two members adapted for longitudinal movement relative to one another, a pawl pivoted on one of said members for swinging movement laterally of the carrier, means interconnecting the other of said members and said pawl whereby said pawl is movable laterally into engagement with the conveyer responsive to said relative longitudinal movement of said members, said carrier being adapted, when said pawl is in engagement with the conveyer, to advance the conveyer, and means for actuating said carrier.

8. Actuating mechanism for an article vending machine of the type having an endless conveyor adapted to be intermittently operated for advancement one step at a time, and comprising an endless chain provided with uniformly spaced apart article engaging elements for impelling said articles to an opening in the machine forming a discharge station along the path of travel of the chain, said actuating mechanism comprising a manually actuated operating lever adapted to be moved through an operating stroke and return stroke, each stroke having an initial portion and a main portion, and a carrier operably connected to said lever, said carrier being longitudinally reciprocable in a path adjacent the path of the chain in response to the strokes of said lever, said carrier including a pair of relatively longitudinally movable members, a pawl pivoted on one of said members for lateral swinging movement into and out of engagement with the chain, means interconnecting the other of said members and said pawl for causing lateral swinging of said pawl in response to said relative longitudinal movement of said members, said carrier remaining translationally stationary and said members being moved relatively to one another during the initial portion of each stroke, said pawl being moved into engagement with the chain in response to the initial portion of the operating stroke and being moved out of engagement with the chain in response to the initial portion of the return stroke, and said carrier being movable translationally during the main portion of each stroke.

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