Sept. 17, 1940. S. E. VAN TUYL 2,215,024

VENDING MACHINE

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Fig. 2.

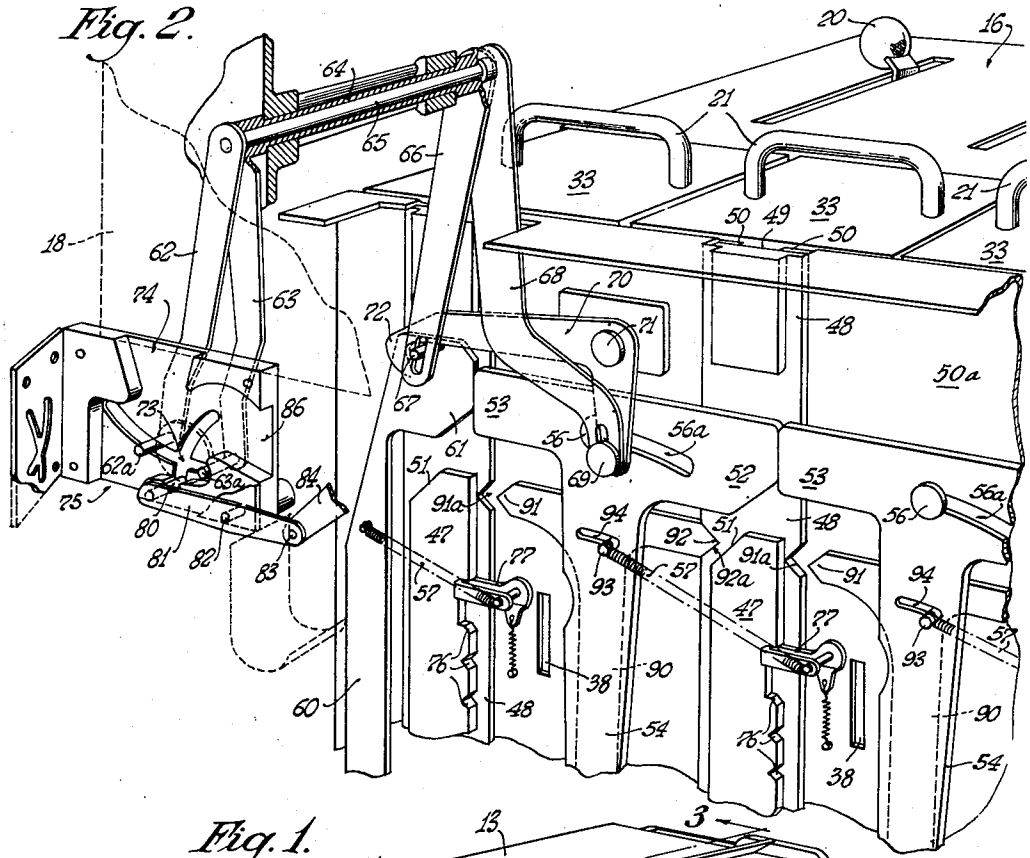
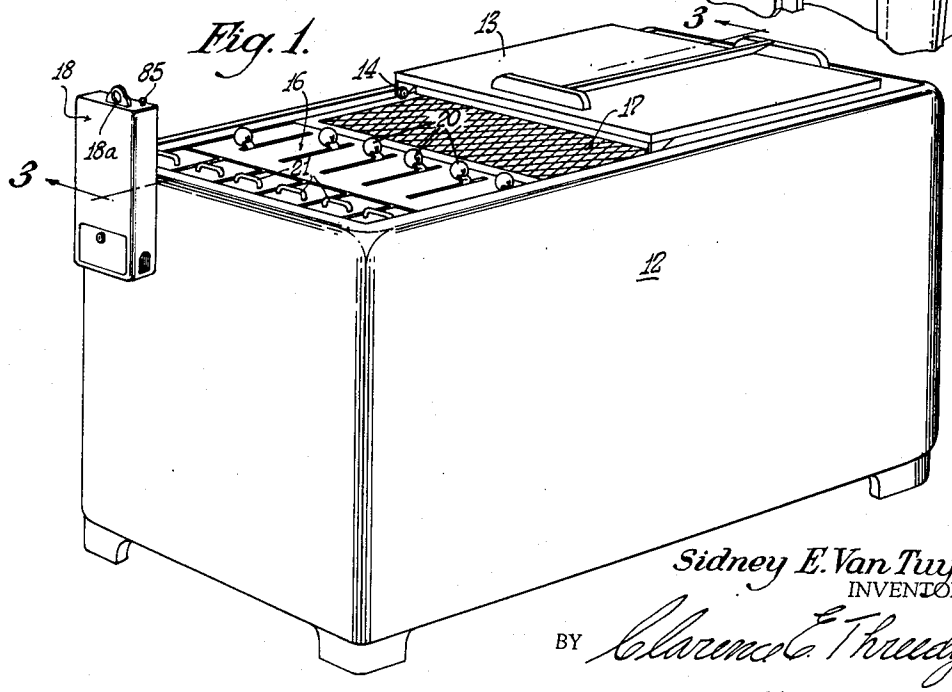


Fig. 1.



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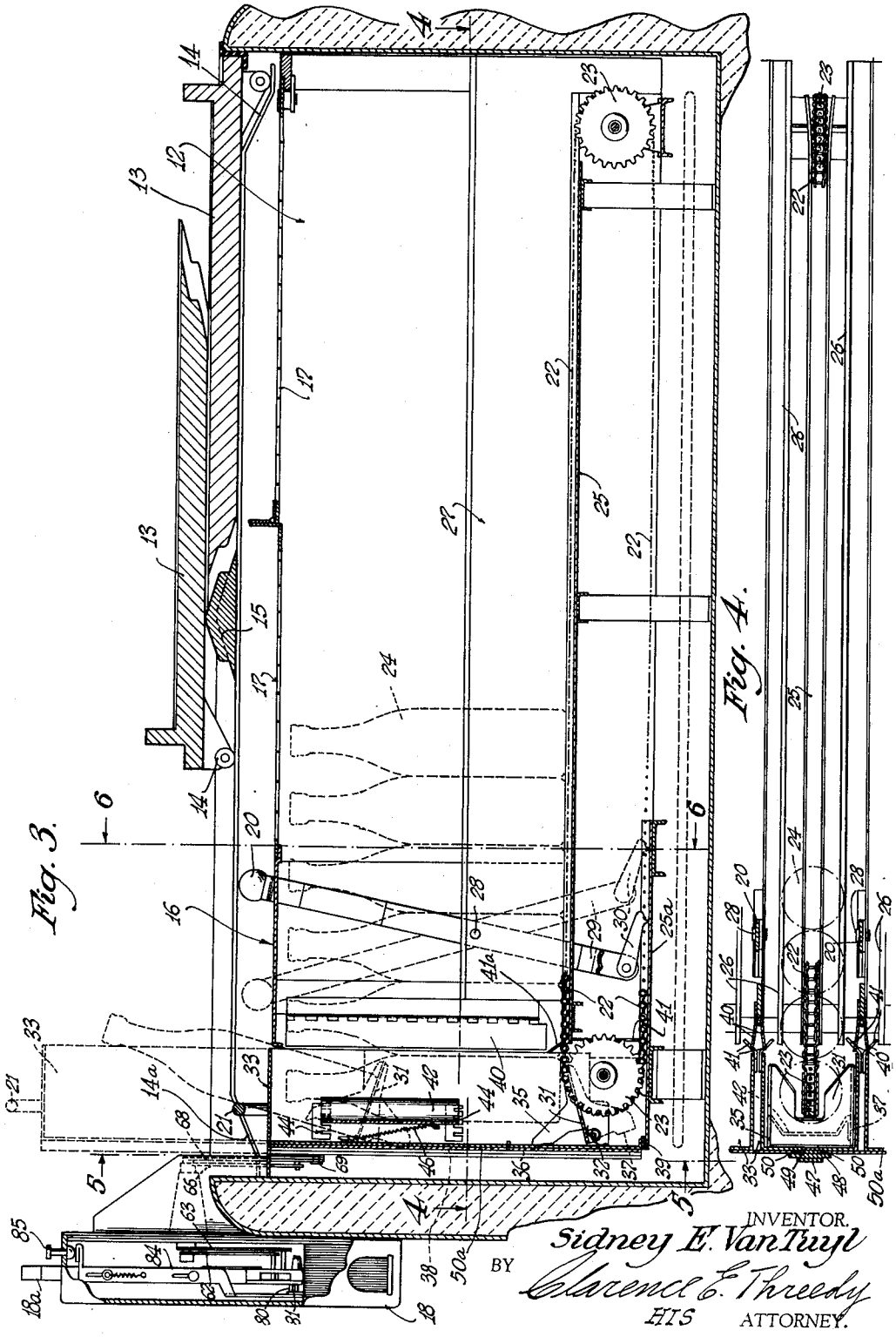


Fig. 3.

Fig. 4.

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VENDING MACHINE

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Fig. 5.

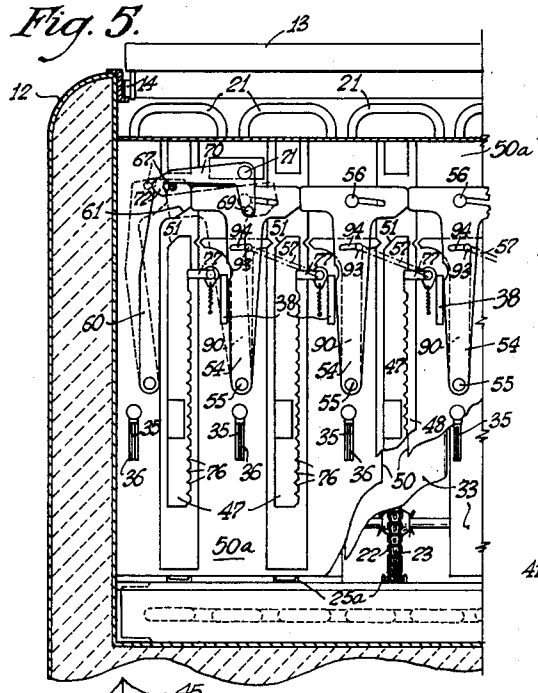


Fig. 6.

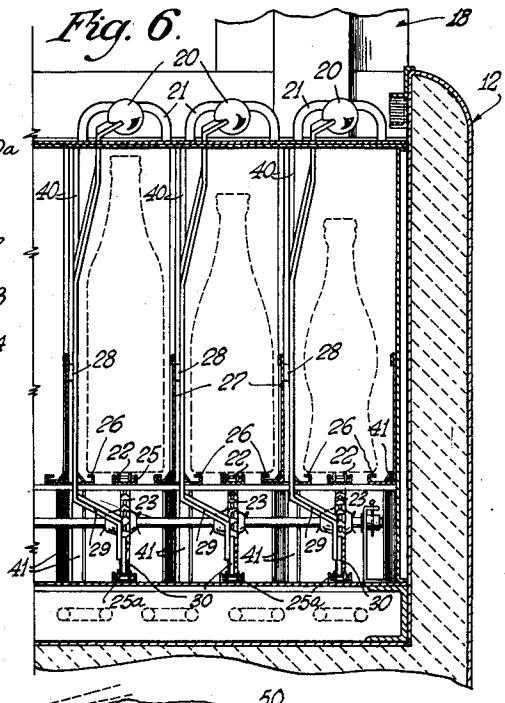


Fig. 8.

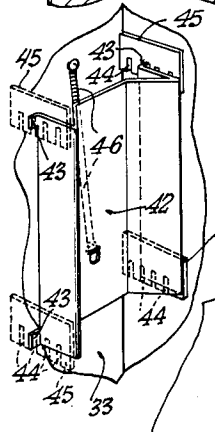


Fig. 7.

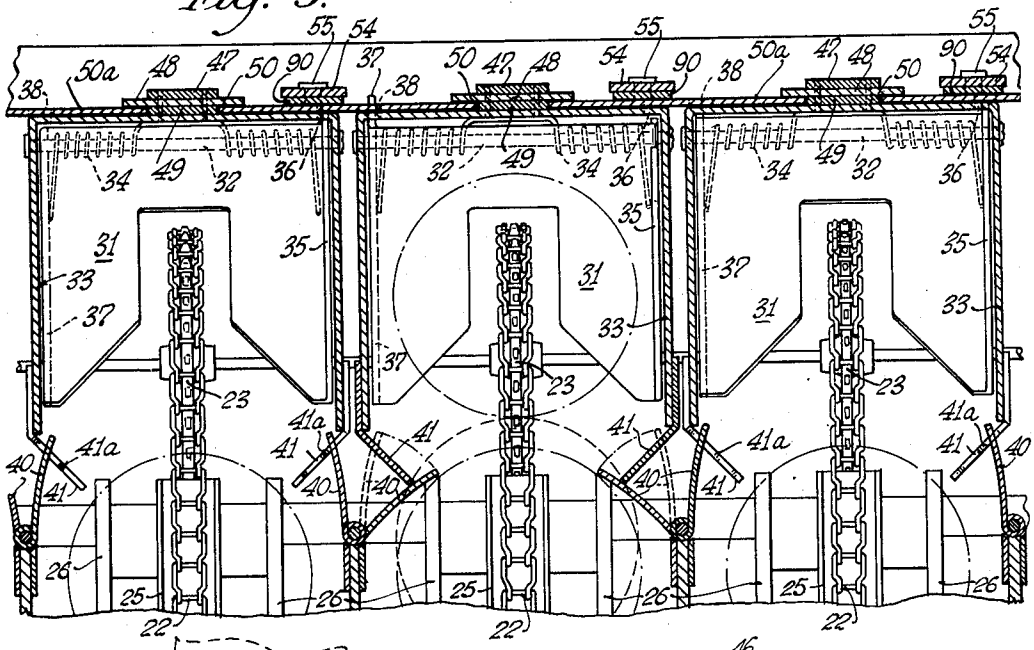
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VENDING MACHINE

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Fig. 9.



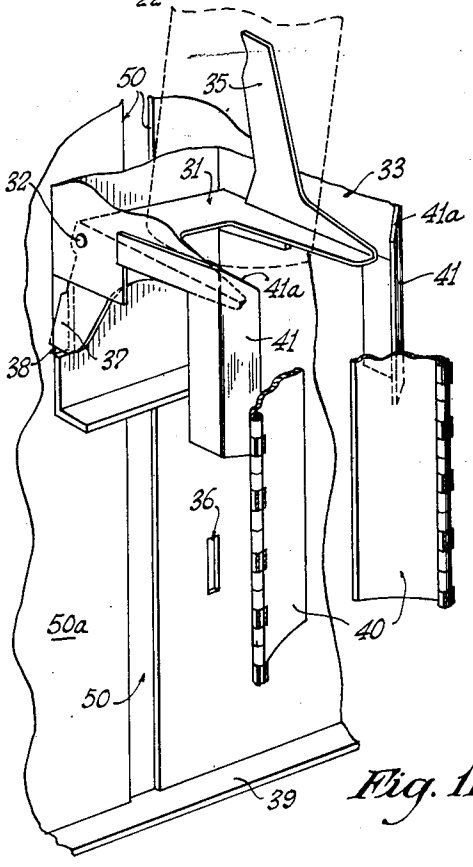


Fig. 11

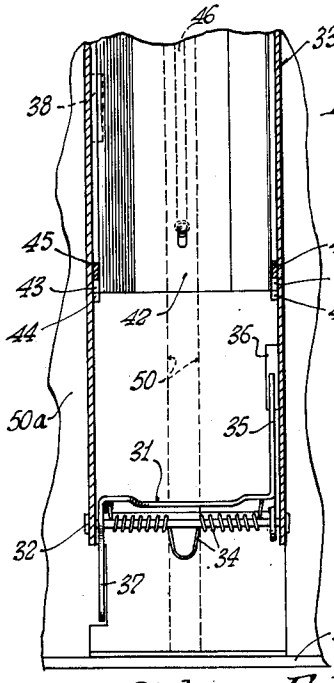


Fig. 10.

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UNITED STATES PATENT OFFICE

2,215,024

VENDING MACHINE

Sidney E. Van Tuyl, Berwyn, Ill., assignor to Claude R. Kirk, River Forest, Ill.

Application June 23, 1939, Serial No. 280,712

3 Claims. (Cl. 312—97)

This invention relates to vending machines, especially those adapted to vend merchandise in units or packages, for example, bottled goods.

A principal object of the invention is the provision of improved means for racking and conveying the bottles in a cooling chamber.

Another object is the provision of improved dispensing means for lifting bottles one at a time from the conveyor into a position of access to the purchaser.

A further object is the combination with the aforesaid dispensing means of a gang coin control for permitting only one dispensing device, among several, to be operated upon deposit of one coin in a coin testing device common to all dispensing units.

A further object is the provision of dispensing elevators operated manually to lift bottles one at a time from the feeding conveyor, and means for preventing operation of the elevator when there is no bottle thereon, together with means for holding the elevator in raised position until the bottle is removed.

Yet another object is the provision of means cooperating with each dispensing elevator for preventing movement of bottles from the conveyor into the elevator when the latter is partially raised.

Other objects and novel aspects of the invention relate to details of construction, operation, and combinations of elements in the illustrative embodiment described hereinafter in view of the annexed drawings, in which:

Fig. 1 is a perspective of a complete machine;

Fig. 2 is an enlarged fragmentary perspective of the gang coin control removed from the cabinet;

Fig. 3 is a vertical longitudinal section through the entire machine and taken along line 3—3 of Fig. 1;

Fig. 4 is a fragmentary horizontal section through one bottle compartment looking down along line 4—4 of Fig. 3;

Fig. 5 is a fragmentary transverse section of the gang control as seen in the direction of line 5—5 of Fig. 3;

Fig. 6 is another fragmentary transverse section which shows some of the bottle dispensers or elevators, as seen along line 6—6 of Fig. 3;

Fig. 7 is an enlarged perspective detail of the conveyor chain and elevating means;

Fig. 8 is a perspective view of the adjustable spacing means for the elevator compartments.

Fig. 9 is a horizontal sectional detail of elevator shelf latches and mounting, similar to the left end of Fig. 4 but to larger scale;

Fig. 10 is an inside elevational view of an elevator shelf latch;

Fig. 11 is a fragmentary perspective of an elevator shelf latch.

Referring to Fig. 1 the machine as an entirety includes a tank-like housing or cabinet 12 provided with a top 13 slidable on rollers 14, at one end, and upon a sealing ramp 15 at the opposite end (Fig. 3) so as to expose the dispensing and control mechanism 16 as well as the interior of the tank, which is guarded by a locked grille 17. When closed, as at the right of Fig. 3, the inner end of the top settles against the ramp, and when opened, rides up onto the ramp as seen at center left in Fig. 3. A coin testing unit 18 is mounted at the front of the cabinet.

All of the bottle feeding control levers 20 of control mechanism 16 are normally free for actuation and by moving a selected one of the levers 20 toward the front (left) of the machine, a bottle or other item of merchandise will be transported onto a manual dispensing elevator which may be raised by grasping the corresponding handle 21 when a proper coin is deposited in the device 18, so that the selected bottle will be raised to a position of access for removal by the purchaser.

Means for stacking and feeding bottles from within the tank into the elevators, includes a plurality of continuous chains 22 each trained around spaced sprockets 23 so as to move in a vertical plane, (Figs. 3 and 4). Bottles are lined up on the upper run of each chain, which lies in a supporting channel track 25 with enough exposed to engage the bottoms of the bottles (Fig. 7).

Additional support for the bottles is provided by side tracks 26 flanking each chain track. It will be understood that there are as many separate chain feeding units are required, all arranged in parallel side by side arrangement as shown in Fig. 6, and the several units are separated by partitions 27.

The control mechanism includes the several levers 20, one for each chain feed, each lever being pivoted as at 28 (Fig. 7) on one of the partitions, and each having an offset foot 29 on which is pivoted a pawl 30 arranged to grab into the chain links of the lower run when the lever is pivoted in one direction (clockwise Fig. 7, anticlockwise Fig. 3) so as to move the chain a distance adequate to carry the leading bottle onto an elevator shelf 31 (Fig. 7) at the front end of the chain. When the levers are restored in the opposite direction, the pawls 30 slip ineffectively

over the chain links. A short channel track section 25a supports each lower chain run beneath its driving pawl.

Each of the shelves 31 is provided as at 32 (Figs. 7, 10, 11) in a corresponding dispensing elevator 33 in the form of an elongated, open-sided box mounted so that its length shifts vertically, thus leaving the open side opposite the end of its feeding chain for movement of the bottles onto the shelf 31 therein. The top end of each elevator box is closed and carries a handle 21.

Each shelf is normally pivoted by spring means 34 to project the end of an integral arm 35 through a slot in the elevator wall and into a slot 36 in an adjoining wall portion, which in this construction is a partition or mounting plate 50a separating the elevators from the coin-controlled mechanism, whereby the elevator is latched against movement upward from its normally lowered position. However, the weight of a bottle on the shelf will pivot the same to withdraw the arm 35 from latching position in which it is shown in Figs. 7 and 10) and free the elevator for upward movement into the position of Fig. 11.

When the elevator has been moved upwardly a certain distance, a second latching pawl 37 on the shelf will ride against the stationary wall member 50a to support the shelf against downward pivoted movement and will move into another slot 38 in the wall member 50a, by action of the shelf under weight of the bottle, to lock the elevator in raised (middle compartment Fig. 9; also Fig. 11) position until the bottle is removed, whereupon the spring means 34 will raise the shelf to withdraw the pawl 37, and the elevator will drop to normal position, the shock being absorbed by a rubber strip 39 common to all elevators.

Means for preventing fraudulent manipulation of a second bottle into the elevator after the same has been partly raised, includes (Figs. 7, 9, 11) diverging hinge strips 40 at the elevator end of each partition, the hinge plates on opposite sides of each chain being pivotable toward each other about their respective vertical axes to block movement of a bottle onto the elevator shelf. Means for moving the blocking strips 40 into blocking position includes the provision on each elevator of a pair of opposite cam wings 41 flanking the entrance thereto and each having a cam edge 41a disposed beneath one of the opposite blocking strips to engage and pivot the latter into blocking position when the elevator rises a short distance from normally lowered position. When the elevator is lowered, the proper advance of the next bottle will swing the blocking strips out the path of the bottle.

In order further to prevent fraudulent manipulation, each elevator is provided with an adjustable spacing back 42, such as shown in Fig. 8, and which consists of a channel-shaped plate having top and bottom wings 43 on its opposite side which fit into spaced slots 44 in mounting arms 45 projecting from the inner back wall of each elevator (see also Fig. 3). Thus the spacing back plates 42 may be fitted into different slots 44 to accommodate bottles of different diameter so as not to leave too much play between the bottle and surrounding parts of the elevator. Each spacing plate is urged upwardly by coil spring means 46 to hold the same in the selected slots.

Means for controlling an entire gang of elevators by a single coin testing unit includes the mechanism shown particularly in Figs. 2 and 5, wherein each elevator 33 is provided with a vertically extending cam bar 47 welded or otherwise attached flush against a vertical flange plate or strip 48 which is attached to a narrower block 49 so as to form opposite vertical track grooves with the back of the corresponding elevator, and in which grooves the marginal edges 50 (Figs. 4, 7, 9) of a vertical slot in the mounting plate 50a ride to support the elevator for vertical movement.

Each cam bar 47 has a camming nose 51 adapted to work between the contiguous nose parts 52 and 53 of T-shaped blocking levers 54, each pivoted as at 55 (coaxially with a companion interlocking lever 90) (Fig. 5) to the vertical mounting plate 50a in between pairs of adjoining cam bars. Thus, between each pair of cam bars is a T-shaped blocking lever arranged with the opposite ends 52, 53 of the cross bar of the T disposed to abut an end of an adjoining T-lever.

In the T-head or cross bar of each T-lever is an arcuate slot 56a into which projects a stationary stud 56 from the main mounting plate 50a to limit movement of the lever, spring means 57 attached to a pin 93 on the companion interlocking lever being provided for each main T lever to urge the same into a normal position away from the master member 60.

When an effort is made to raise any elevator, the nose 51 of the corresponding cam bar will work in between the contiguous ends of the T-levers thereabove, but the lever on the right (Fig. 2) cannot give way because of the limiting action of stud 56 in slot 56a so the left-hand lever gives way toward the left, provided there is nothing at the left extremity 53 thereof to block such movement.

In the present embodiment, there is provided a master blocking lever 60 pivoted to move in the same manner as the rest of the levers and disposed adjacent the last T-lever at the left of the group. The master lever has a blocking head 61 which is contiguous to the next adjoining blocking lever and forms a pair with the latter, which functions with the corresponding cam bar 47 similarly to the other pairs of T-levers.

The master blocking lever coacts with the coin control unit 18 through the agency of a pair of coin-controlled levers 62 and pivoted coaxially on interfitting shafts 64 and 65 journaled within the unit 18. The shaft 64 of lever 63 connects with a link lever 66 which has pin and slot engagement 67 with the master blocking lever, while the shaft 65 of lever 62 is connected through an offset link 68 pivoted as at 69 to one leg of a bell crank latch lever 70 pivoted as at 71 on the main mounting plate 50a. The bell crank latch lever has a hooked latching part 72 disposed normally to engage the pin means 67 on the master lever to restrain movement of the latter. Thus, so long as the latching lever is in normal position, no T-lever can shift, and hence no cam bar can enter between the contiguous ends of the T-lever, and hence no elevator can be raised.

The free ends of the coin levers 62 and 63 are each provided with lateral coin-engaging pins 62a and 63a respectively, which are disposed normally in spaced relation relative to a coin seat 73 having a coin entrance 74 through which coin elements accepted by any desired form of testing device (not shown) pass to rest on the seat between the coin pins 62a and 63a.

It should be observed that there is a normal amount of idle movement or free play between the parts 66—67, 68—72, and T-lever parts

51—52—53—61, with the result that an attempt to lift one of the elevators will actuate the coin levers 62—63, and if there be a proper coin between the coin pins or studs 62a and 63a, the levers 62 and 63 will be coupled by the coin for joint movement, the free play and arrangement of parts being such that the latching hook 72 will be raised to permit a full operative movement of the parts so that the T-levers may yield and permit raising of the elevator.

The coupling coin is carried by the studs or pins 62a, 63a off the seat toward the left (Fig. 2), and the ratio of displacement of coin lever 63 to that of lever 62 is such that by the time the coin is carried into alignment with an acceptance exit 75, lever 62 pulls away from lever 63 and widens the distance between the studs so as to release the coin for gravitation through exit 75.

To prevent fraudulent partial raising of the elevators after deposit of a coin, there is provided a full-stroke mechanism including a rack of teeth 76 on each cam bar, and a spring-urged dog 77 for each rack and which rides over the teeth thereon without interference to the upward movement of the elevator, but which will jam with said teeth to prevent descent of the elevator unless the latter is fully raised, whereupon the lower end of the rack will pass the nose of the dog and pivot into a non-jamming relation to the teeth so that the elevator may descend.

To prevent any possibility of jamming the coin control, should a coin of less than the requisite diameter for any reason find its way onto the seat 73, there is provided a scavenging means in the form of an ejecting stud 80 (Fig. 2) which fits into a recess in the seat beneath the coin, and which is secured to an ejecting arm 81 pivoted as at 82 and having pivotal connection as at 83 with a scavenging lever 84 (upper left, Fig. 3). A button 85 on the top of the coin unit may be pushed to rock lever 81 and cause stud 80 to raise the undersized coin from its seat for movement into a reject or return exit 86, for clearance from the machine (Fig. 2).

To preclude fraudulent manipulation of the elevators, there is provided an interlocking mechanism which will restrain substantial elevating movement of all other elevators, when one is legitimately raised, or when an attempt is made to raise several elevators at the same time, or to raise one before lowering of the legitimately raised elevator or dispenser.

This interlocking fraud preventive mechanism includes a plurality of auxiliary or interlocking T levers 90 similar in construction to the main T levers 54 in that each interlocking lever has opposite nose portions 91 and 92 at the opposite ends of the crossbar of the T.

The interlocking T levers differ from the main or blocking T levers in that the nose portions 91, 92 thereof do not engage with adjacent T levers but respectively fit into V-shaped notches 91a in the opposite edges of the flange strips or plates 48 of the two adjoining elevators.

There is one interlocking T lever pivotally mounted behind each main or blocking T lever, preferably on the same pivot pin 55. However, the pivotal movement of the interlocking levers is limited by means such as the pins or projections 93 thereon, which extend respectively into horizontally elongated slots 94 in the corresponding main levers, both the main and interlocking levers being disposed in the normal position shown in Fig. 2 by action of the springs 57 which are respectively attached to one of the pins 93.

When any main T lever shifts from normal position, the corresponding interlocking lever also shifts as a result of the pin and slot coupling 93—94; and the next adjoining elevator on the left (toward the master blocking lever 60) is locked by engagement of nose 91 in notch 91a to the left.

It should be observed that when any interlocking T lever shifts as aforesaid, the right-hand nose 92 thereof is first cammed out of the notch 92a on its right (since the cam bar 47 must be elevated a certain idle distance before engaging the main T lever part 52), and when the cam bar is thus elevated, the nose 92 on the corresponding interlocking lever rides along the edge of the flange strip (on the right thereof) so that it is at all events impossible for such interlocking lever to be withdrawn from notch 91a to release the elevator on the left so long as the latter is raised substantially.

It is also important to observe that any elevators to the right of the one thus elevated, are locked by action of the corresponding flange plate in moving to withdraw the notch 91a from normal position relative to the next interlocking lever on the right.

Thus, all interlocking levers on one side of a raised elevator (toward the master lever) are shifted into interlocking position by shifting of the contiguous main levers, while the interlocking lever on the opposite side of said elevator remote from the master lever is blocked by the flange plate of the raised elevator, and therefore effects a mutual locking of all remaining contiguous levers through the pin and slot couplings 93—94, supplemented by the blocking of such remaining contiguous main levers by the raised elevator.

Operation

Assuming that a stock of bottled goods has been serially aligned on the several carriers or feeding chains 22, the patron may push the sliding top 13 back to expose the selectively operable levers 20, which may be supplied with name plates indicating the nature of the goods in the several compartments.

The selectively operable feeding levers may be rocked back and forth at will even though no coin has been deposited, and the means making this possible is one of the features of the invention. If one of the levers 20 has been operated to move a bottle into the corresponding elevator compartment, without operating the elevator to remove the bottle, and if this same lever is again operated, the next succeeding bottle will merely bear against the one already resting in the elevator, but there will be no appreciable resistance to the movement of the lever 20 nor the feeding chain 22, since the latter is arranged to slip beneath the bottoms of the bottles if for any reason they cannot move. Thus, injury to the system is obviated from deliberately improper or careless operation of this part of the machine.

The patron may deposit a proper coin in the coin entrance 18a, either prior or subsequent to operation of one of the levers 20, and the coin will ultimately rest between the coin-engaging studs or pins 62a and 63a and couple the locking and release levers for cooperation.

The patron next grasps the handle 21 of the elevator whose lever 20 has been operated, and the elevator is raised, causing the associated cam bar 47 to wedge between the T-shaped blocking levers, thus preventing operation of any other

elevator, and also shifting such of the T levers 54 as happen to be disposed between the raised elevator and master lever 60, whereby to actuate the coin control levers 66—68, which will effect a release of the latch 70—72 provided the coin levers 62—63 are coupled by a coin. The selected elevator, moreover, cannot be lowered until it has been fully raised. As the elevator reaches fully raised position, the bottle therein tilts partly out the open vertical side thereof as illustrated in Fig. 3, where it is accessible to the patron.

When the elevator moves into fully raised position, it is locked against descent until the bottle is removed as a result of the automatic operation of the shelf latch means 31—37 (Fig. 7). When the weight of the bottle is removed from the shelf, the shelf spring raises the same to withdraw the latch, and in this position of the elevator, the full-stroke dog 77 is already released, so that the elevator may fall back to normal position.

The coin which was deposited as aforesaid, is automatically released from between the studs 62*a*, 63*a*, as soon as it is shifted by the latter to a position over the coin acceptance exit 75.

It is recognized that changes may be made in the specifically detailed arrangement described, all without departing from the real scope of the invention, and it is therefore contemplated that the appended claims will be given the broadest possible interpretation permitted by the present state of the art.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a vending machine, article storing and feeding and dispensing means comprising, in combination, spaced horizontally extending supporting rails along which the bottoms of stored articles rest, a continuous band and means supporting the same to be trained in a vertical plane with an upper run extending in parallelism between said rails so as to engage said article bottoms and transport said articles as a group toward an end of the rails constituting a delivery end, oscillatable lever means arranged to move said band in one direction only toward said delivery end, and an article dispensing receptacle arranged for movement back and forth into and out of alignment with said delivery end to receive articles from said rails and transport said articles to a dispensing position.

2. In an article feeding and dispensing mechanism including an article receptacle movable back and forth from article receiving to article dispensing position and article supporting and feeding means having a discharge terminus opposite the receiving position of said dispensing receptacle, the combination with said supporting and feeding means and dispensing receptacle, of fraud preventive means comprising: blocking means arranged at said terminus for movement into and out of position to block passage of articles toward said receptacle, said blocking means being arranged to be moved into non-blocking position by an article moved by said feeding means toward said receptacle, and means operated by said receptacle when the latter moves a predetermined distance away from article receiving position to move and hold said blocking means in blocking position.

3. Control mechnism for use with a series of selectively operable members, said mechanism comprising, in combination, a series of T levers arranged with the ends of the T cross bar in contiguity, means preventing movement of said levers toward one end of the series, a master lever normally blocking movement of the T lever at the opposite end of said series, means releasably latching said master lever against movement, means actuated by each of said selectively operable members for movement in between the contiguous parts of a corresponding pair of said levers to shift one or more of the same toward said master lever for operative displacement provided the master lever is released for movement, whereby movement of other selectively operable members than the one first moved as aforesaid will be blocked, and fraud preventive means including a series of interlocking T levers each operably coupled with one of said first-mentioned T levers and arranged for coaction with the latter to interlock with all selectively operable members between that one of the latter which is operated and the master lever, and to prevent movement of any selectively operable member on the other side of that one of the same which is raised and which is remote from said master lever, by blocking coaction of the corresponding interlocking and T levers.

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