Feb. 27, 1934. H. W. CLAUSEN ET AL 1,949,039

ICE DISPENSING APPARATUS

Filed Dec. 21, 1931 3 Sheets-Sheet 1

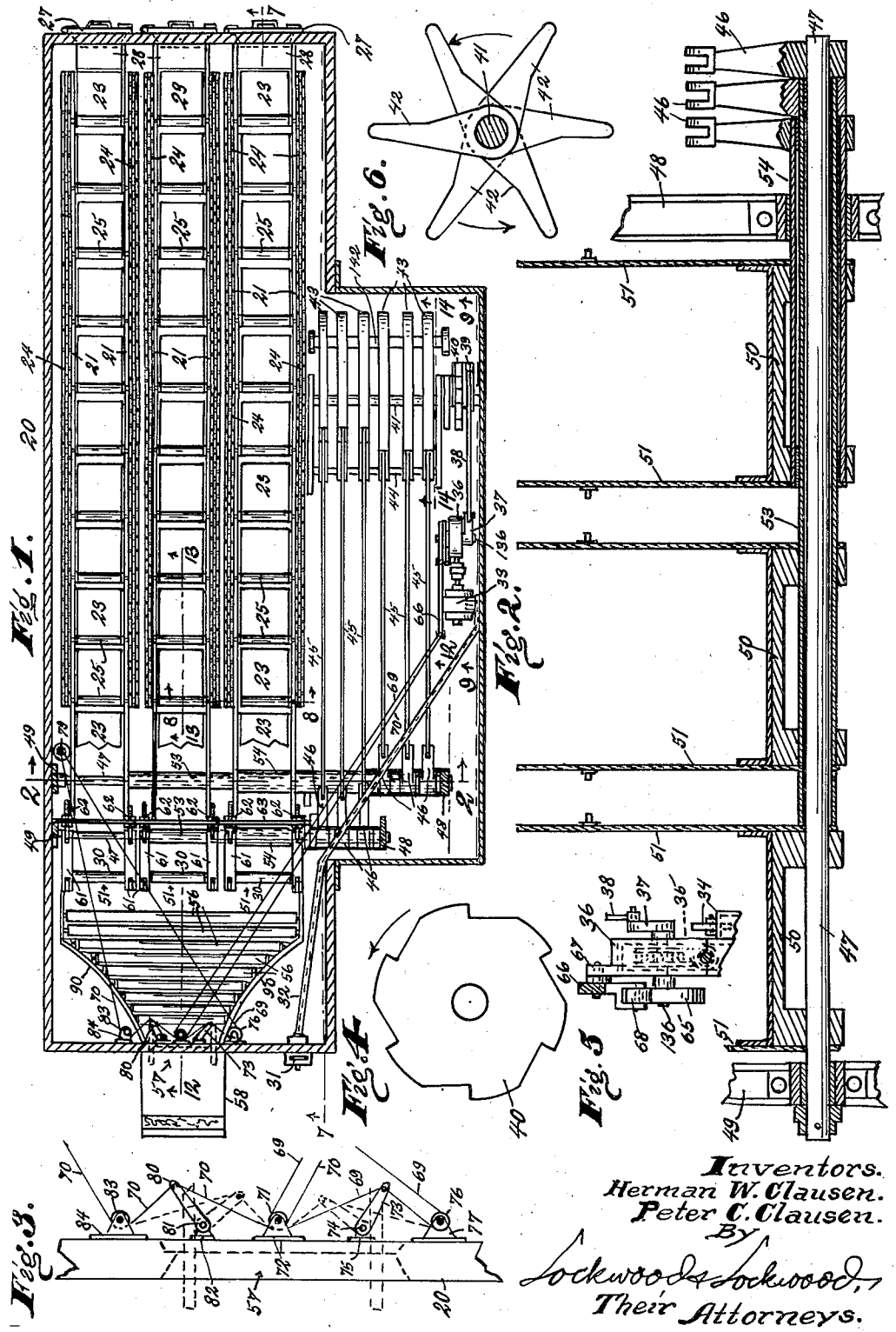


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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Filed Dec. 21, 1931 3 Sheets-Sheet 2

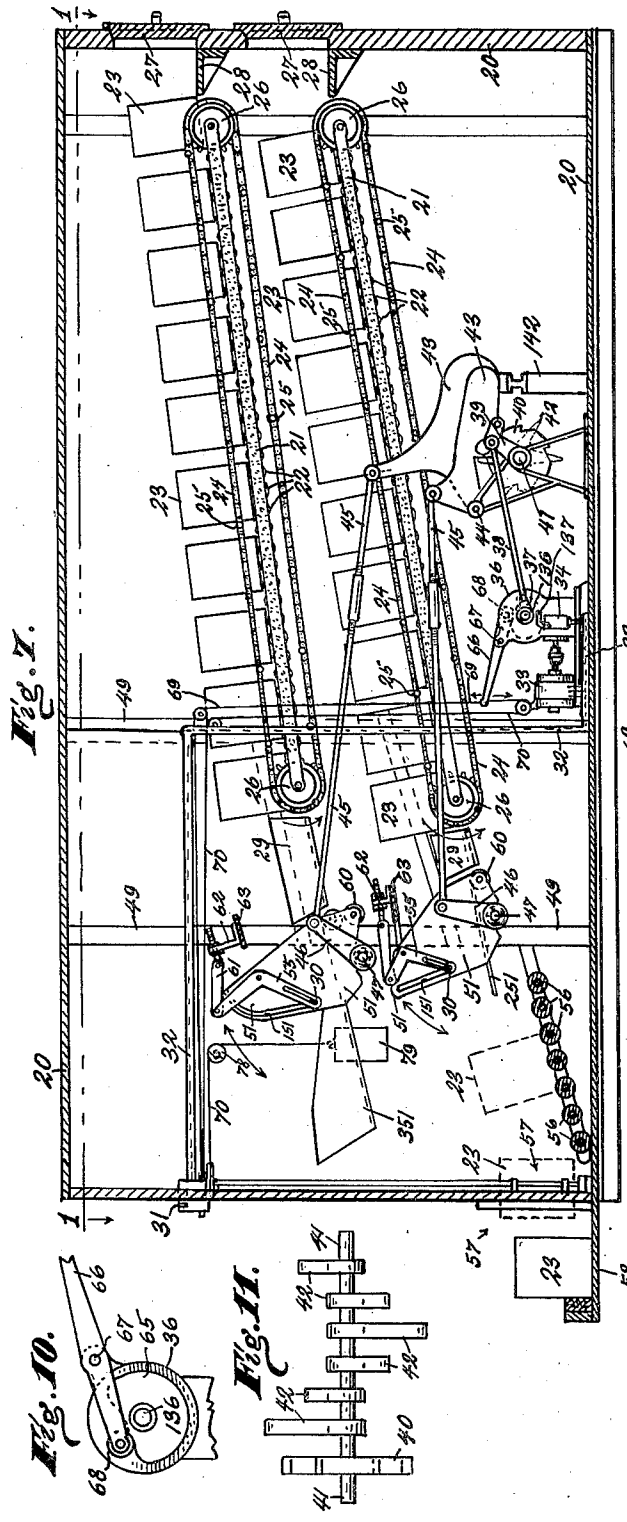


Fig. 7.

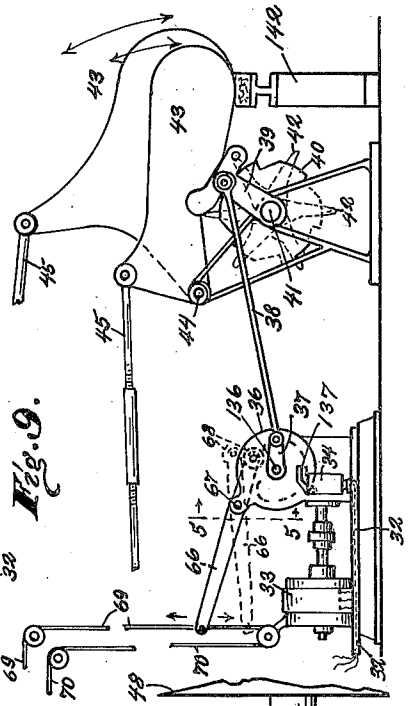


Fig. 9.

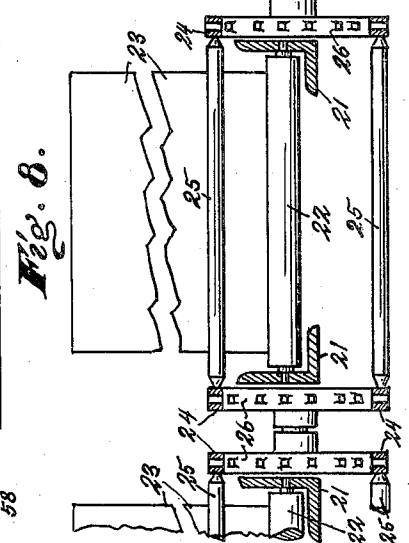


Fig. 8.

Fig. 10.

Fig. 11.

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ICE DISPENSING APPARATUS

Filed Dec. 21, 1931 3 Sheets-Sheet 3

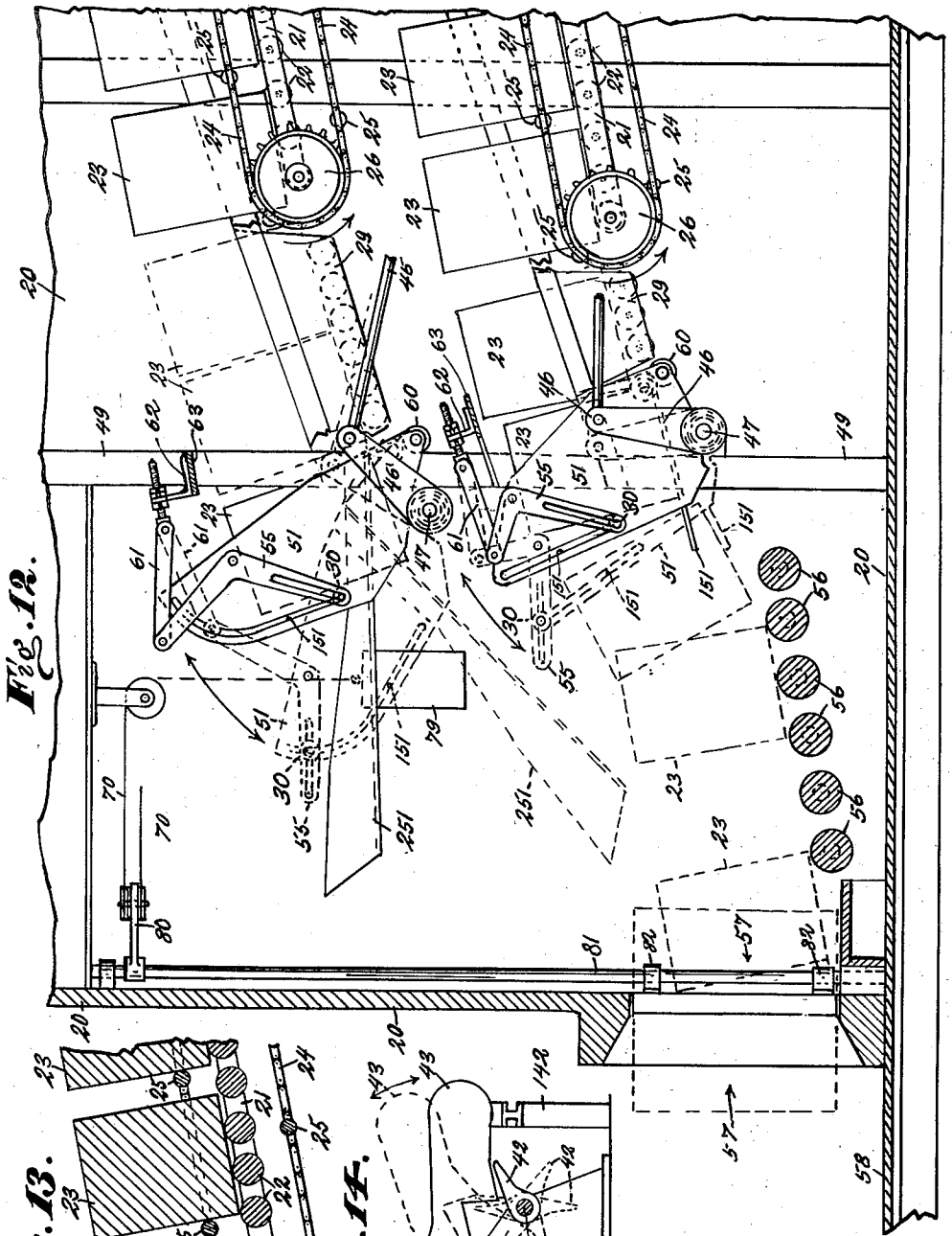


Fig. 12.

Fig. 13.

Fig. 14.

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UNITED STATES PATENT OFFICE

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ICE DISPENSING APPARATUS

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Application December 21, 1931
Serial No. 582,344

3 Claims. (Cl. 312—96)

This invention is a coin controlled mechanism for dispensing packages but the invention was made particularly for the purpose of dispensing blocks of wrapped ice. One object of the invention is the arrangement thereof for giving the mechanism a large capacity. To that end it is provided with a plurality of conveyors, preferably six, each containing a number of blocks of ice or other packages, and coin controlled means for delivering the foremost block of ice or package successively from the plurality of conveyors. That is, at one operation of the machine the foremost block of ice will be delivered from one conveyor and at the next operation the foremost block of ice from another conveyor, and so on for the entire series of conveyors, and then, at the next operation of the machine the delivery means will return and act in connection with the first conveyor, and said process will be repeated.

Another feature of the invention consists in means for separating the packages from each other on each conveyor. In an ice delivery machine this invention keeps the blocks from freezing together, but such separation is desirable while using the machine for delivering other kinds of packages.

The foregoing and other objects of the invention will be better understood from the accompanying drawings and the following description and claims.

In the drawings herein:

Fig. 1 is a plan view of the machine with the casing in cross section and the blocks of ice near the lower end of the conveyors being broken away to show the gate controlling means, and showing the coin controlled mechanism and the gate controlling means diagrammatically. Fig. 2 is substantially a vertical section transversely of the machine on the line 2—2 of Fig. 1, with parts broken away and parts omitted. Fig. 3 is a diagrammatic plan view of the door construction, parts being broken away. Fig. 4 is a side elevation of the ratchet wheel for controlling the consecutive opening of the gates to deliver packages from the different conveyors. Fig. 5 is a vertical section on line 5—5 of Fig. 9, parts broken away. Fig. 6 is a section of the cam shaft showing the cam arms thereon in elevation for opening successively the gates for delivery of packages from the different conveyors. Fig. 7 is a vertical section through the machine on the staggered line 7—7 shown in Fig. 1, showing parts of the machine in side elevation. Fig. 8 is a transverse vertical section through the machine on the line 8—8 of Fig. 1, with parts broken away. Fig. 9 is an enlarged side elevation of the motor and the conveyor selecting means shown on a larger scale than in Fig. 7. Fig. 10 is a side elevation of the cam and associated parts for controlling the delivery door, parts being broken away. Fig. 11 is a plan view of the cam shaft and arms thereon for selecting packages successively from the different conveyors. Fig. 12 is a vertical section through the lower delivery portion of the machine on the line 12—12 of Fig. 1.

Fig. 13 is a vertical longitudinal section through one of the conveyors with blocks of ice thereon, on line 13—13 of Fig. 1. Fig. 14 is a reproduction of a part of the right hand portion of what is shown in Fig. 9, with parts omitted to explain the construction and operation of one of the conveyor selecting means.

The machine herein shown for the particular purpose of delivering blocks of ice is provided with a casing 20 in which the mechanism is mounted. As seen in Figs. 2 and 7 six inclined conveyors 21, here of the roller type, are provided substantially as indicated in Fig. 13. In Fig. 1 there are shown three of these conveyors in the upper group, side by side, and in Fig. 7 a lower and similar group of three conveyors is shown, thus providing six conveyors. They are shown to have rollers 22 and are downwardly inclined so that blocks of ice 23 or other packages may readily travel down the same by gravity. Each conveyor has on each side an endless chain 24, and said chains carry spacing rollers 25, not for the purpose of moving the blocks or packages 23, but for the purpose of keeping them separate. The spacing rollers are mounted on the chains 24 far enough apart to admit a block or package between each pair of them, and thus they prevent the ice blocks from freezing together and are useful for separating packages of any character. The packages, as they move by gravity, propel the chains 24.

The chains 24 are mounted on pairs of idle sprocket wheels 26 at the ends of each conveyor 21. The blocks of ice or packages are placed on each conveyor at the upper end thereof through the rear doors 27, shown in Figs. 1 and 7, and their pressure on their spacing rollers 25 move the chains whenever a package is made at the delivery end of the machine. Through the rear doors 27, the blocks of ice or other packages are slid in over shelves 28.

From the conveyors 21 the blocks by gravity pass in upon the delivery rollers 29 shown in

Fig. 12 and continue moving downward until the advancing blocks of ice are stopped by the gate rollers 30, and by this means the conveyors of the mechanism are filled.

In the machine herein shown there are three upper conveyors adapted to receive thirteen blocks or packages each, and three lower conveyors adapted to receive twelve blocks each, making the capacity of the machine shown to be seventy-five blocks of ice or packages, but it is understood, of course, that there can be any number of conveyors of desired length.

After the machine has been charged with ice or packages 23, a purchaser approaches the delivery end of the machine shown at the left hand end of Fig. 1 and deposits a coin in the coin slot 31 to pay for a block of ice or package, and the coin makes an electrical connection through the conduit 32 with motor 33, through a switch 34. This part of the machine is not shown otherwise than diagrammatically, because the particular construction of the coin mechanism is not part of this invention.

The operation of the motor drives the worm gear 35 in the housing 36 to rotate the shaft 136 one revolution, and thereby actuates the crank 37, connecting rod 38, ratchet arm 39, ratchet 40, and thus partially rotates the cam shaft 41, see Figs. 9, 10 and 4, and gives to said ratchet 40 a partial or step movement which causes one of the arms 42 to actuate a weighted lever 43, which is fulcrumed at 44 and operates the connecting rod 45 extending to the crank 46, as appears in Figs. 2 and 7.

Shaft 41 has six arms 42, as seen in Fig. 6, equally arranged angularly on said shaft, and each arm is adapted to rock its particular weighted lever 43 to open the corresponding gate 51.

There are two series of arms 46, one lower series, as shown in Fig. 2, for operating the gates for the lower conveyor, and one upper series, as shown in Fig. 9, for operating the gates of the upper conveyors. The first of the series of arms 46, see Fig. 2, is secured on a rod 47 mounted in the uprights 48 and 49 and which has a bearing 50 on which the rocking gate members 51 are secured, as shown in the left hand portion of Fig. 2.

There is a series of three arms 46 shown in Fig. 2 for the lower set of conveyors; and the second arm shown in Fig. 2 is secured on a tube 53 on rod 47 and it operates the intermediate gate 51. The third arm 46 is secured on another tube 54 which loosely surrounds the tube 53 and it operates the right hand gate shown in Fig. 2.

When one of the arms 46 is rocked by the means above explained, the gate 51 is rocked from the position shown by full lines to the position shown by dotted lines in Fig. 12. Said movement of gate 51 rocks the bell crank 55 also to the dotted line position shown in Fig. 12, which lifts the gate roller 30, that extends through slots 151 in gate 51, from the lower position shown to the upper dotted line position. This permits the movement forward by gravity of the forward block of ice or package, which had previously been held back by the roller 30, to the rollers 56 which lead to the delivery door 57 in the left hand end of the casing, as seen in Figs. 7 and 12, whereby the ice or package is discharged upon the delivery platform 58.

Simultaneously with the foregoing operation of the gate 51 the roller 60 is lifted by the tilting of the gate 51 up behind the forward block or package to stop the following block of ice or package and hold it back. The bell crank 55 is connected by the bar 61 to a bracket 62 on a cross plate 63 that is secured on the uprights 49, as seen in Figs. 7 and 12.

Still simultaneously with the foregoing operation the cam 65 on shaft 136 in the gear housing 36, seen in Figs. 9 and 10, is turned by the worm gear 35 from the position shown in Fig. 9 so as to move the arm 66 downward from the position shown by full lines in Fig. 9 to the dotted line position therein. This lever 66 is fulcrumed at 67 between its ends to the housing 36 and on its inner end carries a roller 68 that travels on the cam 65 as seen in Figs. 9 and 10. The downward movement of the arm 66 causes it to move the cables 69 and 70 which pass around the pulley 71 on a bracket 72.

The cable 69 is fastened on one side of the lever 66 and the cable 70 on the other. The cable 69 passes over the pulleys 71 and is then fastened to the outer end of the lever 73 pivotally connected on the rod 74 that controls one wing of the discharge door 57. The cable 69, after being secured to the end of the lever 73, is extended on around a pulley 76 in the bracket 77 and is further extended over a pulley 78 and is fastened to the counterweight 79 that is sufficiently heavy to close the door 57, when the lever 66 is moved back to its normal position. The other cable 70 is extended around the pulley 71 and secured to the outer end of the lever 80, that is pivoted on a rod 81 in the brackets 82 that are secured to the other wing of the door 57. This door-controlling mechanism illustrated diagrammatically in Figs. 1, 3 and 7 is old in the art and is shown conventionally for the purpose of this application.

In order to facilitate safe delivery of the packages from both the upper and lower conveyors, the lower gate 51 is provided with an extension 251 which when lowered, as shown by dotted lines in Fig. 12, releases the discharged package onto the series of rollers 56 that are inclined from the uprights 48 and 49 toward door 57. Also the upper gates 51 are provided with elongated chute extensions 351 that move down a considerable distance toward the rollers 56 so that the blocks or packages have but a short distance to fall when discharged from the upper gates.

From the foregoing it can be readily seen that the apparatus operates to deliver packages successively from the lower and upper tiers of conveyors in a prearranged order, so that the same number of packages or blocks of ice are delivered from each conveyor alike and in the delivery the packages are spaced as described and move downwardly in a body, each block or package adding its weight to its respective cross roller 25 to move their respective pairs of chains 24.

Also from the foregoing it can be readily seen that the insertion of a coin in the slot 31 causes the delivery door 57 to open at the same time that a package is released from one or the other of the gates 51 to discharge to the platform 58 and that as soon as the discharge is accomplished the weight 79 closes the door and the weighted levers 43 move to return the gates to their normal position.

Guides 90 are provided at the delivery end of the apparatus to guide the packages 91 toward the centrally arranged delivery door 57. After a package is discharged the door 57 and the gate 51 that has been actuated return automatically to closed positions.

In operating the machine a coin is inserted in

coin slot 31, which coin closes an electric circuit to motor 33. The motor, through the worm drive heretofore described, actuates the shaft 136 a single revolution, and then it is stopped by crank 37 engaging switch lever 137 which is arranged to break the circuit and stop the motor each time the crank 37 has made one revolution. This action of the motor turns cam shaft 41 forward one step, causing one cam arm 42 to actuate a gate 51 to release a package or block of ice, also to open discharge door 57 to permit the released package to pass out to the delivery platform 58.

To prevent more than one block of ice or package at a time from discharging from a conveyor, each gate 51 is provided with a follow-up roller 60 that is moved up into the path of the following block of ice, as illustrated by full and dotted lines in Fig. 12.

The weighted levers 43 normally rest on a support 143 that is arranged rearward of the cam shaft 41 and these weights are sufficiently heavy to return the gates 51 to their normal position and hold back the following package or block of ice, when a delivery of a package has been consummated. The stop rollers 30 are arranged so that when returned to their normal position they hold back the blocks of ice when the conveyors are fully charged and are effective to so operate regardless as to the pushing weight of the ice.

We claim as our invention:

1. Package dispensing apparatus including a conveyor for conveying blocks of ice one behind the other in single file, a gate pivotally mounted adjacent the discharge end of the conveyor so as to rock and when in one position will hold a block of ice and stop the delivery movement of the other blocks of ice and when operated will permit said first block of ice to be discharged, a bell crank lever having a stop bar that is adapted to be elevated by the delivery movement of said gate out of the path of said first block of ice, and another stop bar connected with said gate which is adapted when the gate is given its delivery movement to be elevated by the gate behind said first block of ice being delivered so as to hold back the other blocks of ice until the gate is returned to normal closing position.

2. Package dispensing apparatus including a conveyor for conveying blocks of ice one behind the other in single file, a gate pivotally mounted adjacent the discharge end of the conveyor so as to rock and when in one position will hold a block of ice ready for delivery and stop the delivery movement of the other blocks of ice and when operated will permit said first block of ice to be discharged, a bell crank lever having a stop bar that is adapted to be elevated by the delivery movement of said gate out of the path of the first block of ice, and another stop bar connected with said gate which is adapted when the gate is given its delivery movement to be elevated by the gate behind the block of ice being delivered so as to hold back the other blocks of ice until the gate is returned to normal closing position, a weighted lever connected with said gate for holding it in and returning it to non-delivery position, and automatic means for rocking said gate and permitting the delivery of a block of ice.

3. Package dispensing apparatus including a conveyor for conveying blocks of ice one behind the other in single file, a gate pivotally mounted adjacent the discharge end of the conveyor so as to rock and when in one position will hold a block of ice ready for delivery and stop the delivery movement of the other blocks of ice and when operated will permit said first block of ice to be discharged, a bell crank lever having a stop bar that is adapted to be elevated by the delivery movement of said gate out of the path of said first block of ice, and another stop bar connected with said gate which is adapted when the gate is given its delivery movement to be elevated by the gate behind said block of ice being delivered so as to hold back the other blocks of ice until the gate is returned to normal closing position, a weighted lever connected with said gate for holding it in and returning it to non-delivery position, means for rocking said gate and permitting the delivery of a block of ice, a delivery door through which each block of ice is adapted to pass when opened, other means for simultaneously opening the delivery door with the actuation of said gate, and a motor for actuating the gate and door controlled means.

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