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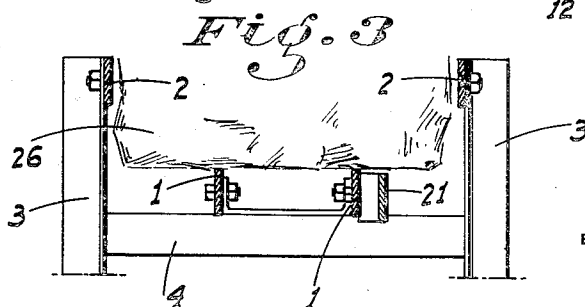
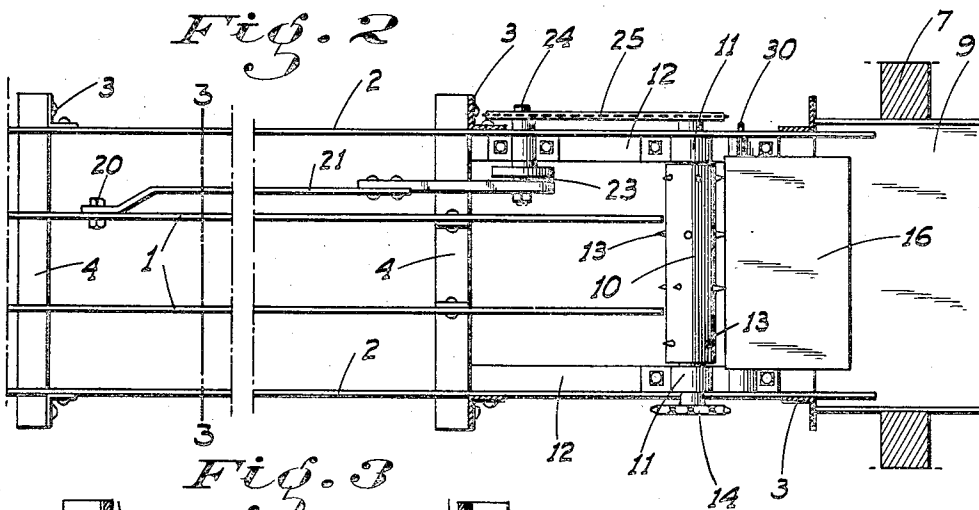
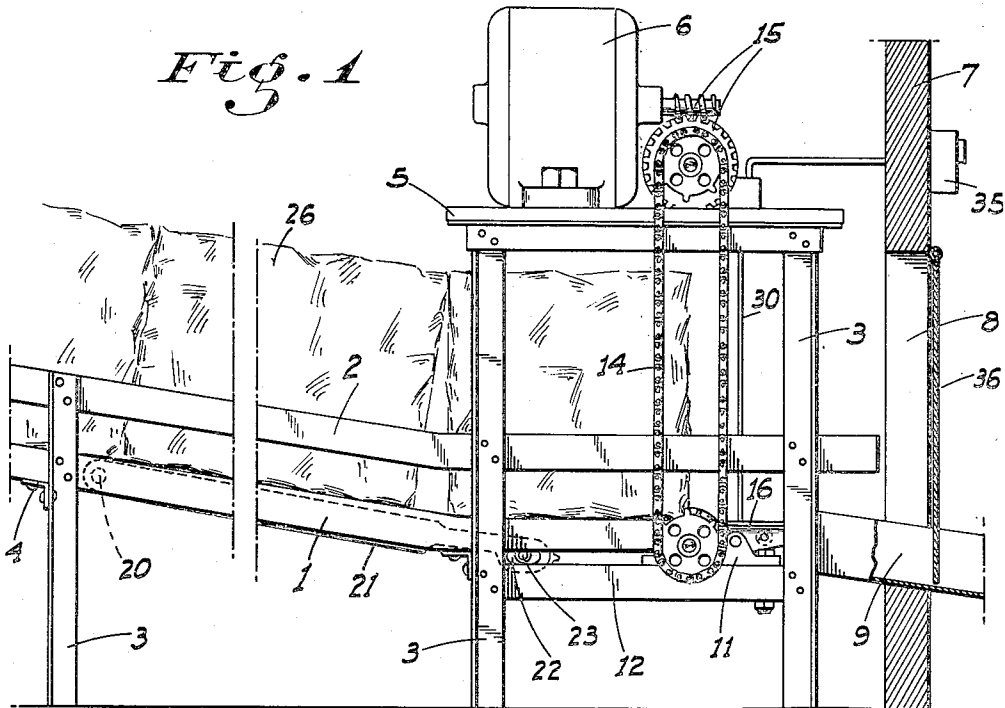
J. S. RAIDEN

1,975,973

ICE DISPENSING APPARATUS

Filed March 6, 1933

2 Sheets-Sheet 1



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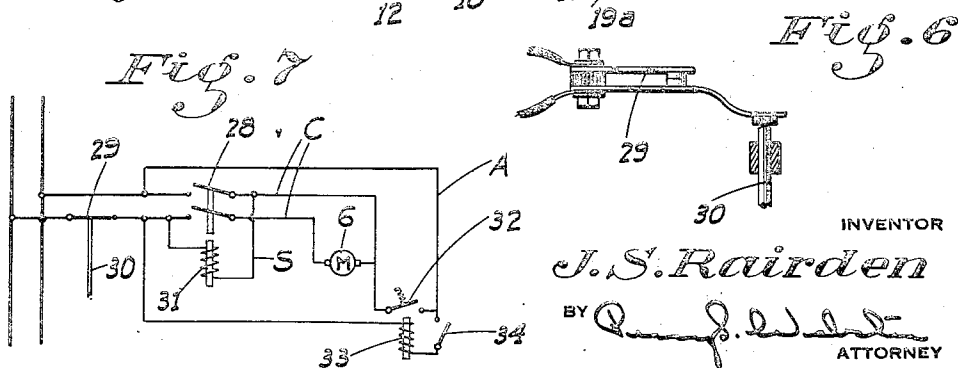
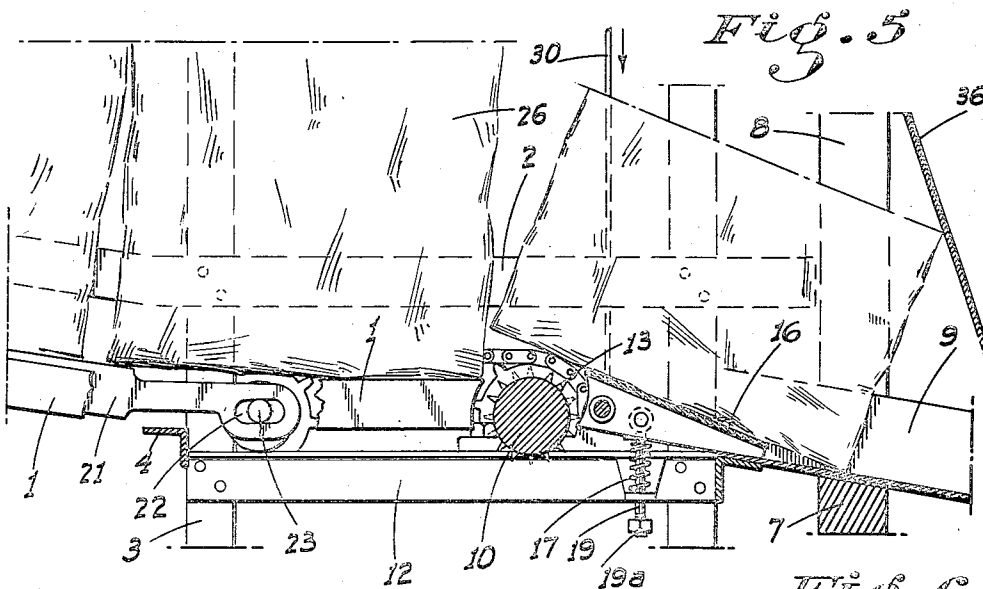
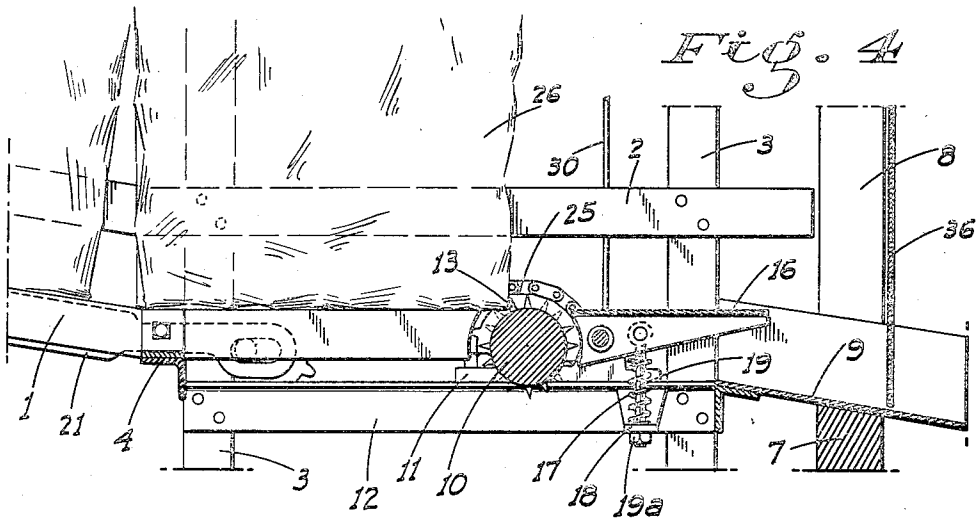
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UNITED STATES PATENT OFFICE

1,975,973

ICE DISPENSING APPARATUS

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Application March 6, 1933, Serial No. 659,611

6 Claims. (Cl. 193—40)

This invention relates to devices for dispensing ice to the public at retail from the ice house of what may be considered the self-help type, in which the dispensing of the ice does not require the services of an attendant to wait on the customer.

The principal object of my invention is to provide an apparatus of this general character which includes a support or conveyor for a row of individual ice blocks, and improved means for advancing the blocks to be dispensed with a minimum of power, and a means functioning with the dispensing operation for dislodging or disadhering any blocks which may possibly have frozen to each other or to the support, so that the proper functioning of the apparatus will not be interfered with on that account.

The blocks are individually dispensed with the aid of an electric motor and I have also provided means operated by the discharge of a block from the apparatus for instantly opening the motor circuit so as to halt the dispensing operations. The device as a whole is of an extremely simple and trouble-proof nature so that upkeep, care and expense is negligible and the only manual attention necessary is that required to occasionally reload the block conveyor.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of the apparatus foreshortened.

Fig. 2 is a similar top plan view of the motor supporting platform and adjacent parts removed.

Fig. 3 is a fragmentary cross section of the conveyor on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged sectional elevation of the dispensing end of the apparatus showing the normal position of the block releasing and dispensing mechanism.

Fig. 5 is a similar view showing a block as being dispensed.

Fig. 6 is a diagrammatic side view of the apron controlled switch for the motor circuit.

Fig. 7 is a diagram of the circuit of the apparatus.

Referring now more particularly to the characters of reference on the drawings, the apparatus comprises a block support or conveyor comprising transversely spaced rails 1 and side guide bars 2 above and spaced further apart

than the rails; these bars and rails being supported at intervals by uprights 3 and cross beams 4. The length of the conveyor is sufficient to support a considerable number of ice blocks of the 50-lb. size or less in abutting relationship and for the greater portion of its length has a slope sufficient to cause the blocks to tend to slide down of themselves. The lower end portion of the conveyor for a length approximating that of a single block is straight; and the uprights 3 supporting said portion project to a considerable height above the conveyor and on their upper ends support a platform 5 on which the operating motor 6 is mounted.

The entire conveyor is disposed inside the ice house or cold storage chamber so that its lower end terminates near the outer wall 7 of the building. This wall has an opening 8 therein in line with the conveyor for the passage of a block of ice, which is then supported on a fixed chute 9 projecting through the opening. The conveyor rails terminate short of the interior end of the chute and immediately beyond said end of the rails is a transversely extending roller 10, whose upper surface is substantially in horizontal alignment with the top of the rails. This roller is journaled in end bearings 11 supported on beams 12 extending lengthwise of the conveyor between the adjacent uprights.

The roller has a plurality of rows of circumferentially spaced and radially projecting pins or prongs 13 disposed in spaced relation along the roller, said rows extending spirally about the roller so that at least one pin will be always in a substantially upstanding position. The roller is rotated from the motor 6 at a suitable speed and so that its upper surface turns in the direction of the chute by means of a chain drive 14 or the like, with a non-reversible reduction gearing unit 15 between the motor and the adjacent end of the chain drive.

The roller on the side adjacent the chute delivers onto an apron 16 which is pivoted at its ends adjacent the roller in connection with the bearings 11 or like members. The apron in turn overhangs and delivers onto the adjacent end of the chute 9. Said apron is normally maintained horizontal and substantially on a level with the top of the rails and roller by suitable means such as compression springs 17 disposed between the apron and brackets 18 mounted on the beams 12. These springs may be associated with rods 19 pivoted on the apron and projecting through the springs and brackets, with adjustable nuts 19a on their lower ends

so that the upward movement of the apron due to the spring action will be limited.

If the ice house is kept at the proper temperature the blocks will not tend to freeze to the rails or to each other, such action being the result of alternate thawing and freezing. If such conditions should obtain however I have provided a simple and efficient means to offset or counteract the effect of such freezing action. This means is arranged as follows.

Pivoted as at 20 on the outside of one of the rails 1 some distance beyond the horizontal portion of the conveyor and extending lengthwise thereof to the adjacent end of the straight portion is a bar 21. At its free end the bar is provided with a longitudinal slot 22 engaged by a crank pin 23. This pin is mounted in connection with a shaft 24 drivingly connected to the roller 10 by a chain drive 25 or the like. This bar is arranged so that with the rotation of the shaft 24 and accompanying eccentric movement of the crank pin relative thereto, the bar will be alternately raised above and lowered relative to the adjacent rail. This simple device acts to alternately tilt or raise and lower the blocks of ice with which the bar 21 comes in contact with its oscillating movement, and thus dislodges such blocks from possible freezing contact with the rails or with each other.

A further dislodging action on the foremost block is afforded by the fact that said block when abutted against one of the roller pins extends to the beginning of the slope of the conveyor, so that the adjacent block is disposed at an angle thereto as shown in Figs. 1 and 4. Not only therefore are the adjacent faces of these blocks mainly separated so that they cannot adhere to any extent, by the sliding movement of the blocks down the conveyor, but the removal of the foremost block from the apparatus will cause the next block to separate itself from the succeeding block if it has adhered thereto owing to the change of position of said blocks relative to each other and which they assume before the foremost block comes to rest.

The circuit C for the motor has a normally open switch 28 therein and another normally closed switch 29. This latter switch is mounted on the platform 5 and is connected to or operated by a rod 30 projecting upwardly from the apron 16. This rod is arranged relative to the shaft of the apron so that when said apron is tilted forwardly as shown in Fig. 5 the rod opens or permits the switch to open, but when the apron is in its normal horizontal position the rod acts to hold the switch closed. The switch 28 is closed by a magnet 31 interposed in a secondary circuit S and including a portion of the motor circuit C. This secondary circuit has a normally open switch 32 therein disposed beyond the motor circuit portion. The closing of this switch is controlled by a magnet 33 interposed in an auxiliary circuit A which is included in part with the circuit S and connected to the motor circuit between the switches 28 and 29, as shown. The auxiliary circuit has a coin controlled switch 34 therein preferably mounted in connection with a coin box 35 mounted on the outside of the wall 7 adjacent chute 9 or in any other position convenient to a customer.

It will therefore be seen that when the switch 34 is closed by inserting a coin in the box the circuit A will be closed and the magnet 33 will be energized. This causes the switch 32 to be closed, closing the circuit S through the magnet

31. This magnet will then be energized closing the switch 28. This completely closes the motor circuit, since the switch 29 as previously stated is normally closed. Then even though the switches 34 and 32 should again open as they will after the coin has passed through, the motor circuit will remain closed on account of the fact that the portion of the circuit S in which the magnet 31 is interposed is connected to the motor circuit and forms a holding circuit for the switch 28.

When the switch 29 is opened all the circuits are broken, stopping the motor and said motor circuit will not be again closed even though the switch 29 is again closed, until another coin has been inserted to close the switch 34 as described at the start.

The operation of the motor causes the roller 10 to be driven. This allows the adjacent ice block to advance relative to the holding pin of the roller with which it has been in contact, and said block passes over the roller while successive pins engage the under surface of the block and act to positively advance the same. The fact that the blocks naturally tend to advance down the conveyor of themselves due to the slope of the latter, enables a very low power motor to be used for the dispensing operation, since the rotation of the roller controls the advancing movement rather than having to actually pull the entire weight of the block forward. The non-reversible feature of the reduction gearing 15 of course prevents the weight of the foremost block, and which abuts against one of the roller pins, from tending to rotate the roller of itself. Said block therefore having been advanced by the rotation of the roller is transferred onto the apron 16 and as soon as the distribution of its weight on the apron is such as to overbalance the latter against the resistance of the springs, the apron will tilt down and allow the block to slide onto the chute 9 for delivery to the customer. The tilting of the apron opens the switch 28 and causes the motor to stop as previously explained. In the meantime the remaining blocks of ice on the conveyor have advanced of themselves until the foremost one is stopped by another upstanding pin on the roller, ready for the next dispensing operation.

The opening 8 is preferably normally closed by a flexibly mounted flap or door 36 of suitable character, which prevents the entrance of warming currents of air from the outside, and which is of course pushed aside by the block sliding down the chute 9, as shown in Fig. 5.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A dispensing apparatus for ice blocks including a conveyor for a row of blocks disposed to cause the blocks to move toward one end of the conveyor, a roller disposed transversely of the conveyor substantially on a level therewith and at said end of the conveyor, means to ro-

tate the roller so that its upper surface turns away from the conveyor, and pins upstanding from the roller and disposed in circumferentially and longitudinally spaced relation on the same.

5 2. A dispensing apparatus for ice blocks including a conveyor for a row of blocks disposed to cause the blocks to move toward one end of the conveyor, a roller disposed transversely of the conveyor substantially on a level therewith
10 and at said end of the conveyor, means to rotate the roller so that its upper surface turns away from the conveyor, and circumferentially spaced rows of pins projecting radially from the roller; each row extending spirally about the roller in such relation as to always cause
15 one pin to lie in a substantially upstanding position.

3. A dispensing apparatus for ice blocks including a conveyor for a row of blocks disposed
20 to cause the blocks to move toward one end of the conveyor, means to dispense the foremost block from the conveyor, a bar whose length is equal to that of a plurality of blocks extending lengthwise of the conveyor under the blocks,
25 pivot means for one end of the bar; and means operated by the dispensing means to alternately raise and lower the bar about its pivot; said operating means being arranged to cause the free end of the bar to be alternately disposed
30 above and below the level of the conveyor.

4. A dispensing apparatus for ice blocks including a conveyor for a row of blocks disposed to cause the blocks to move toward one end of the conveyor, means to dispense the foremost
35 block from the conveyor, a tiltable apron beyond the dispensing means and onto which the block is initially moved by the dispensing means, said apron being tilted forwardly by the block when the latter has moved to a certain position on
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the apron to cause the block to then slide from the apron, and means governed by such tilting of the apron for halting the operation of the dispensing means.

5. A dispensing apparatus for ice blocks including a conveyor for a row of blocks dispensed to cause the blocks to move toward one end of the conveyor, means to dispense the foremost block from the conveyor, a tiltable apron beyond the dispensing means and onto which
80 the block is initially moved by the dispensing means, said dispensing means including an electric motor, a circuit for the same and a switch in the circuit, means yieldably holding the apron from tilting and maintaining it in a
85 predetermined normal position; said apron being tilted forwardly by the block when the latter has moved to a certain position on the apron so that said block then slides from the apron, and means between the apron and switch to
90 hold the latter closed when the apron is in its normal position and allowing said switch to open when the apron is tilted.
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6. A dispensing apparatus for ice blocks including a conveyor for a row of blocks arranged
100 to cause the blocks to slide of themselves toward one end of the conveyor, releasable stop means normally halting the advance of the foremost block on the conveyor, operating means to release said stop means and at the same time advance said block, and means functioning with the operation of said operating means to positively raise the block immediately back of the one being advanced so as to dislodge the same from possible freezing contact with the conveyor and cause the same to slide ahead and take the place of the advanced blocks.
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