Sept. 17, 1929. F. FINK 1,728,726

PUSHING APPARATUS

Filed May 16, 1928

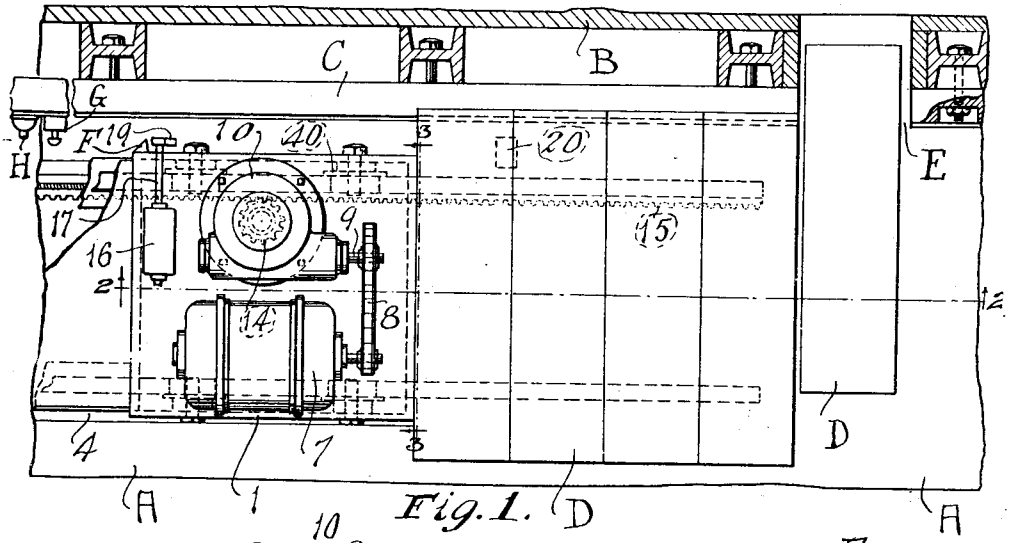


Fig. 1.

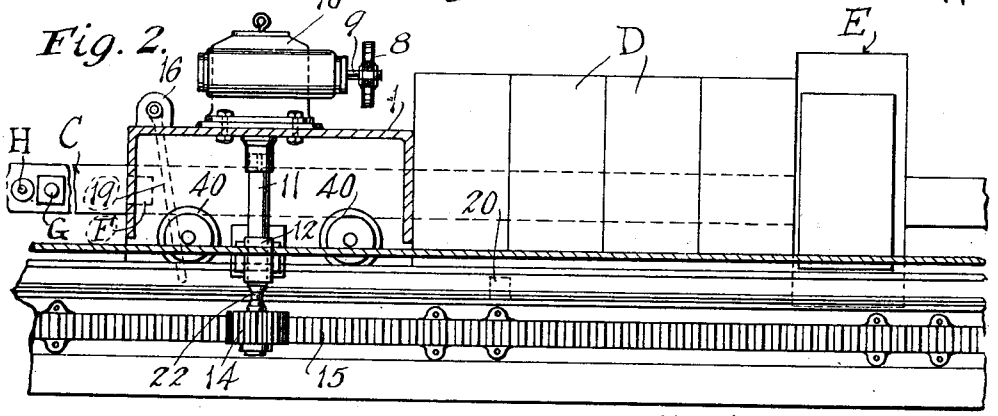


Fig. 2.

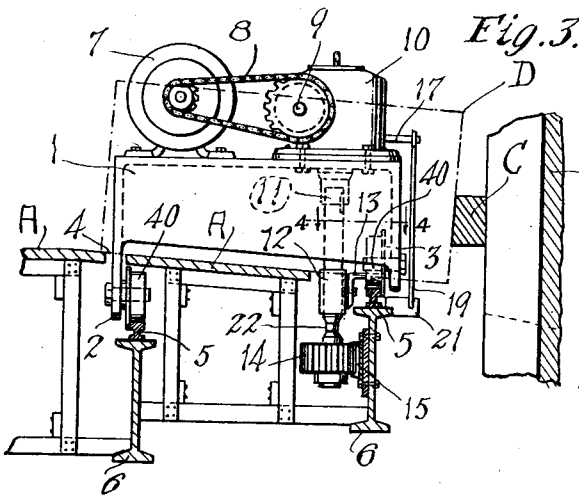


Fig. 3.

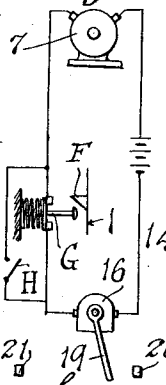


Fig. 5.

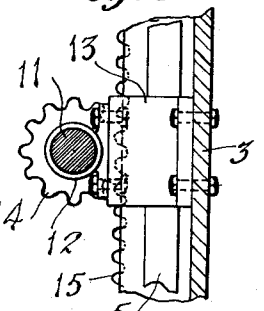


Fig. 4.

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UNITED STATES PATENT OFFICE

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PUSHING APPARATUS

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This invention relates in general to apparatus for pushing objects along a predetermined path, and more particularly to such apparatus for pushing a plurality of cakes or blocks of ice along the floor of an ice house.

In ice manufacturing plants the cakes or blocks of ice as they are ejected from the cans are arranged in a row on the floor against a bumper rail on one wall of the house toward which the floor declines and in which there is a discharge opening, and the blocks are carried on an endless conveyor along said floor and bumper rail to said opening through which they slide outwardly by gravity.

One object of my invention is to provide power operated apparatus of the character described embodying novel and improved features of construction for simultaneously pushing all of a plurality of such blocks of ice along said floor so that the blocks are always arranged in immediate succession in a row with one always ready to be ejected through said opening.

Another object is to provide a novel and improved pushing apparatus including a pusher arranged to run on a track and driven by a motor mounted on the pusher and geared to a straight rack whereby great traction and power are obtained.

Other objects are to provide a pushing apparatus of this character including means for automatically reversing the direction of movement of the pusher and stopping the same; to provide such apparatus which shall be simple, inexpensive and reliable in construction and operation, and to obtain other advantages and results as may be brought out by the following description.

Referring to the accompanying drawings, in which corresponding and like parts are designated throughout the several views by the same reference characters,

Figure 1 is a top plan view of a pushing apparatus embodying my invention.

Figure 2 is a transverse vertical sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a transverse vertical sectional view taken on the line 3—3 of Figure 1,

Figure 4 is a fragmentary horizontal sectional view taken on the line 4—4 of Figure 3, and

Figure 5 is a wiring diagram.

Specifically describing the illustrated embodiment of the invention, the reference character A designates the floor of an ice house or the like which gradually declines toward a wall B upon which is arranged a horizontal bumper beam C against which blocks or cakes of ice D are arranged in a row as the cakes are ejected from the freezing cans. The wall B has an opening E therein through which the blocks or cakes of ice D are passed into an adjacent room or platform. The construction so far described is old and no claim of novelty thereon is made.

My pushing apparatus includes a pusher 1, which has side flanges 2 and 3, one of which depends through a slot 4 in the floor A. Each of these flanges has journalled thereon a pair of wheels 40 arranged to run on a rail 5 which may be conveniently mounted on an I-beam 6, to provide the required stability. The rails 5 are arranged substantially parallel to the bumper beam C and beneath the floor A so that the pusher 1 is arranged to move parallel to the bumper beam C toward and from the opening E in the wall B.

For automatically moving the pusher along said tracks I may utilize a reversible electric motor 7 secured to the top of the pusher and connected by a chain and sprocket gearing 8 to the shaft 9 of a speed reducing gear mechanism 10 of known construction. This speed reducing mechanism is also mounted on top of the pusher 1 and has a driving shaft 11 extending downwardly vertically and journalled in a bearing 12 secured in a bracket 13 to the inside of the flange 3 of the pusher. The shaft also has fast mounted thereon a pinion 14 meshing with a rack bar 15 secured to the web of the I-beam 6. The speed reducing gear mechanism 10 causes the shaft 11 to be driven at a relatively slow speed and obviously rotation of the shaft 11 due to meshing of the pinion 14 and rack bar 15 will cause movement of the pusher along the rails 5.

In operation of the apparatus, the pusher is normally disposed at the end of the row of

blocks D of ice opposite the opening E, and when the motor 7 is started the pusher moves the blocks of ice toward the opening E. As each block reaches the opening, it immediately slides therethrough due to the inclination of the floor A, and accordingly the blocks are successively ejected through the opening upon continued movement of the pusher in the same direction.

Preferably means is provided for automatically reversing the direction of movement of the pusher when it reaches the opening E. This means may comprise a reversing switch 16 of known construction mounted upon the top of the pusher and including an operating shaft 17 upon one end of which is a depending arm 19 to cooperate with spaced abutments 20 and 21 disposed upon the corresponding I-beam 6, one of the abutments being adjacent the opening and the other being disposed at the opposite end of the path of movement of the pusher. When the pusher reaches the opening E, the arm 19 strikes the abutment 20 which actuates the switch 6 to reverse the current through the motor 7, and when the pusher reaches the other end of its path of movement the arm 19 strikes the other abutment 21 so as to throw the switch into reverse position. At the same time a cam F on the pusher 1 will operate a normally closed stationary stop switch G cutting off the current and thereby bringing the apparatus to a stop. To start the pusher in the other direction toward the opening E, the operator presses a conveniently located push button switch H, thereby closing the circuit.

The shaft 11 is preferably formed with a reduced portion 22 so that the shaft 11 will break at that point should the pinion jam on the rack or the ice cakes become obstructed or jammed in the opening E.

While I have shown and described the invention as embodying certain details of construction, it will be understood that this is primarily for the purpose of illustrating the principles of the invention, and that many modifications and changes may be made in the details of construction without departing from the spirit or scope of the invention.

Having thus described the invention, what I claim is:

1. In apparatus of the character described, the combination of a support for a plurality of blocks of ice, a wall having an opening therein and toward which said floor declines so that said blocks may be arranged in a row along said wall at one side of said opening, a pusher mounted to move along said floor at the end of said row of blocks opposite said opening, and reversible motor mechanism for driving said pusher.

2. In apparatus of the character described, the combination of a support for a plurality of blocks of ice, a wall having an opening therein and toward which said floor declines so that said blocks may be arranged in a row along said wall at one side of said opening, a pusher mounted to move along said floor at the end of said row of blocks opposite said opening, reversible motor mechanism for driving said pusher, and means for automatically reversing said motor mechanism when said pusher reaches said opening in said wall to cause said pusher to move away from said opening.

3. In apparatus of the character described, the combination of a support for a plurality of blocks of ice, a wall having an opening therein and toward which said floor declines so that said blocks may be arranged in a row along said wall at one side of said opening, a pusher mounted to move along said floor at the end of said row of blocks opposite said opening, reversible motor mechanism for driving said pusher, means for automatically reversing said motor mechanism when said pusher reaches said opening in said wall to cause said pusher to move away from said opening, and means for automatically stopping said motor mechanism at a predetermined point in the return movement of said pusher.

4. Pushing apparatus comprising a support for the object to be pushed, a track beneath said support, a pusher having a wheeled carriage mounted on said track and also having a portion extending above said support to engage said object, a motor on said carriage, a rack bar adjacent said track, and a gearing connection between said motor and said rack bar for moving said pusher.

5. In apparatus of the character described, the combination of a support for a plurality of blocks of ice, a wall having an opening therein and toward which said floor declines so that said blocks may be arranged in a row along said wall at one side of said opening, a track beneath said support, a pusher having a wheeled carriage mounted on said track and also having a portion extending above said support to engage said blocks of ice, a motor on said carriage, a rack bar adjacent said track, and a gearing connection between said motor and said rack bar for moving said pusher.

6. The apparatus set forth in claim 5 wherein said motor is electrically operated and reversible and wherein said gearing connection includes speed reducing gearing and with the addition of a reversing switch for controlling said motor, and means for automatically actuating said switch to reverse the motor when said pusher reaches said opening.

FERDINAND FINK.