June 30, 1953 H. O. McLAIN 2,643,522

ICING MACHINE

Filed Feb. 1, 1950 6 Sheets-Sheet 1

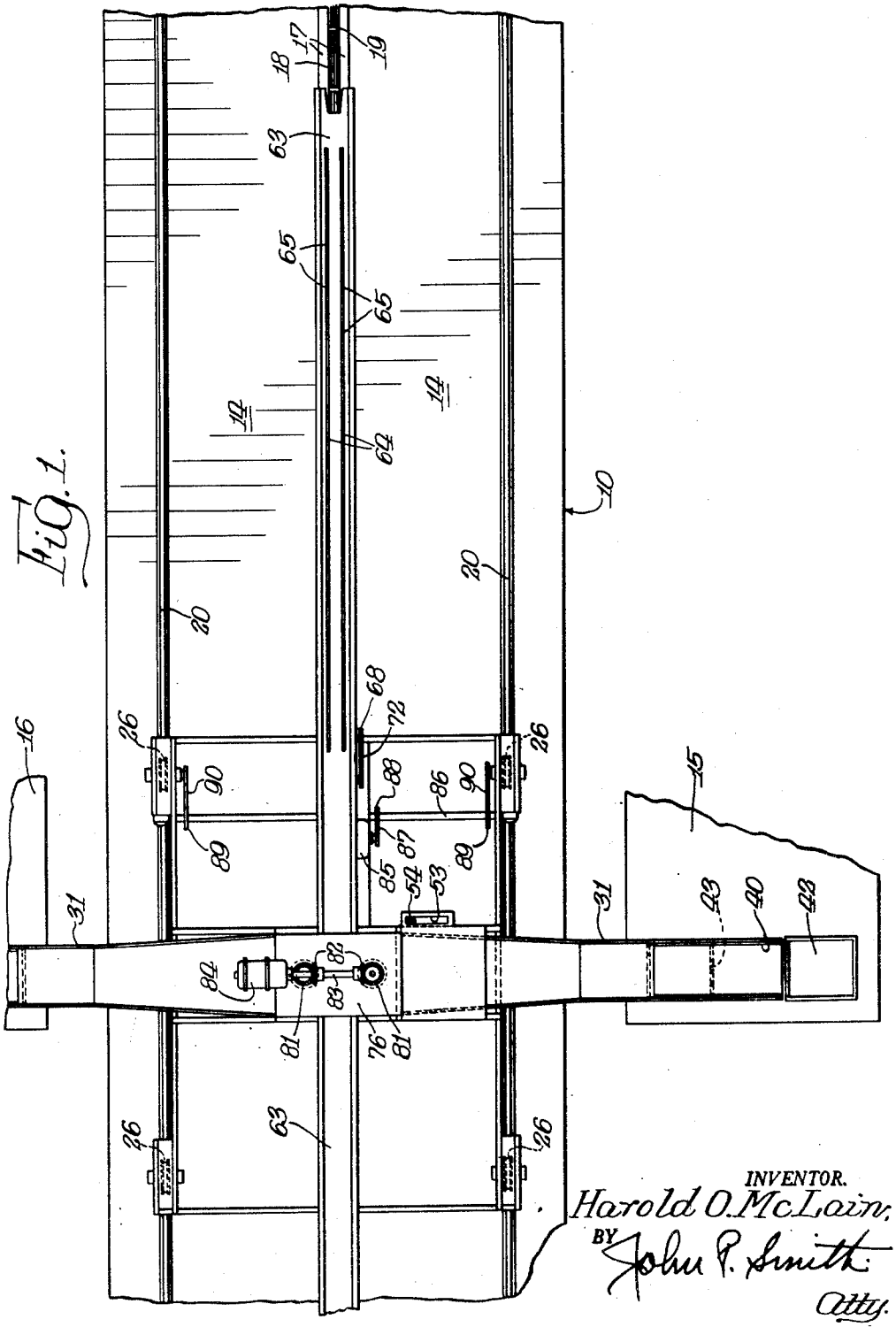


Fig. 1.

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Fig. 2.

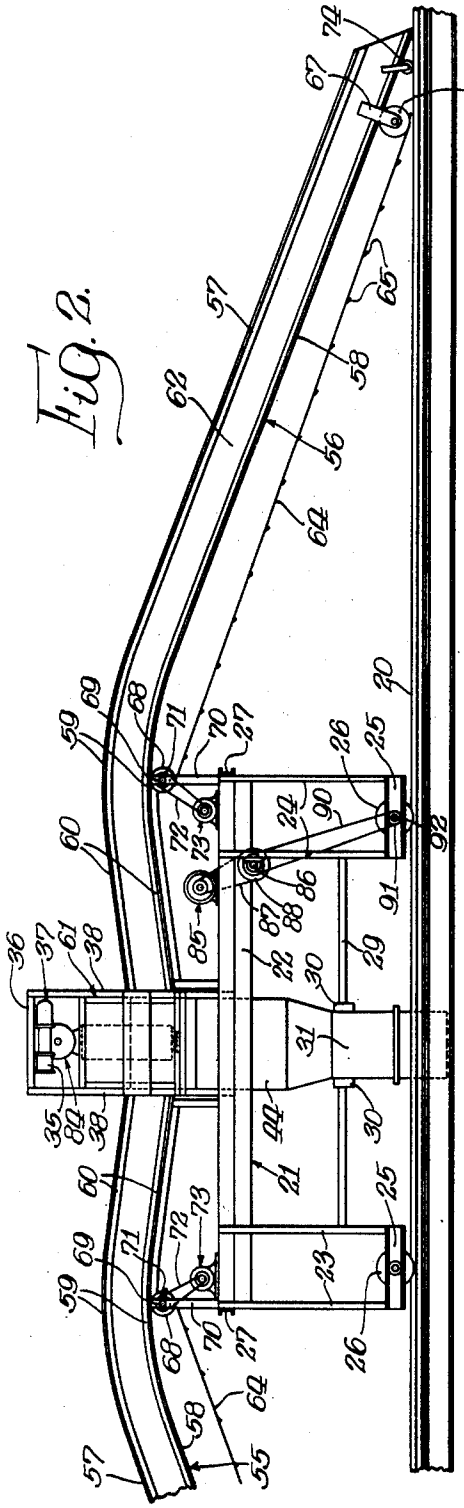
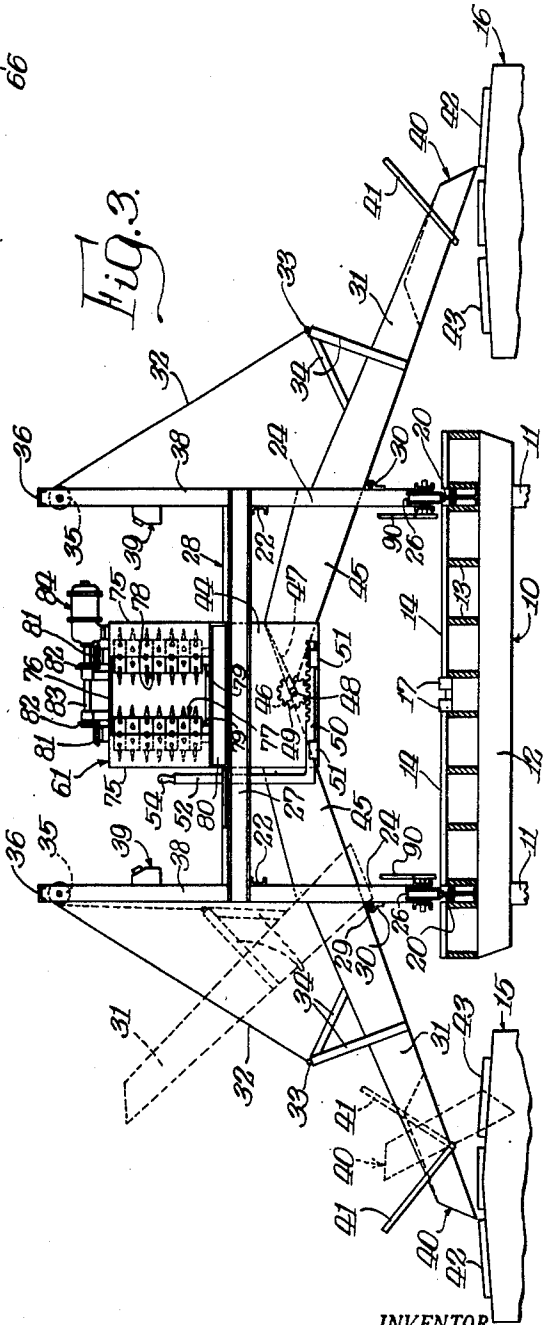


Fig. 3.



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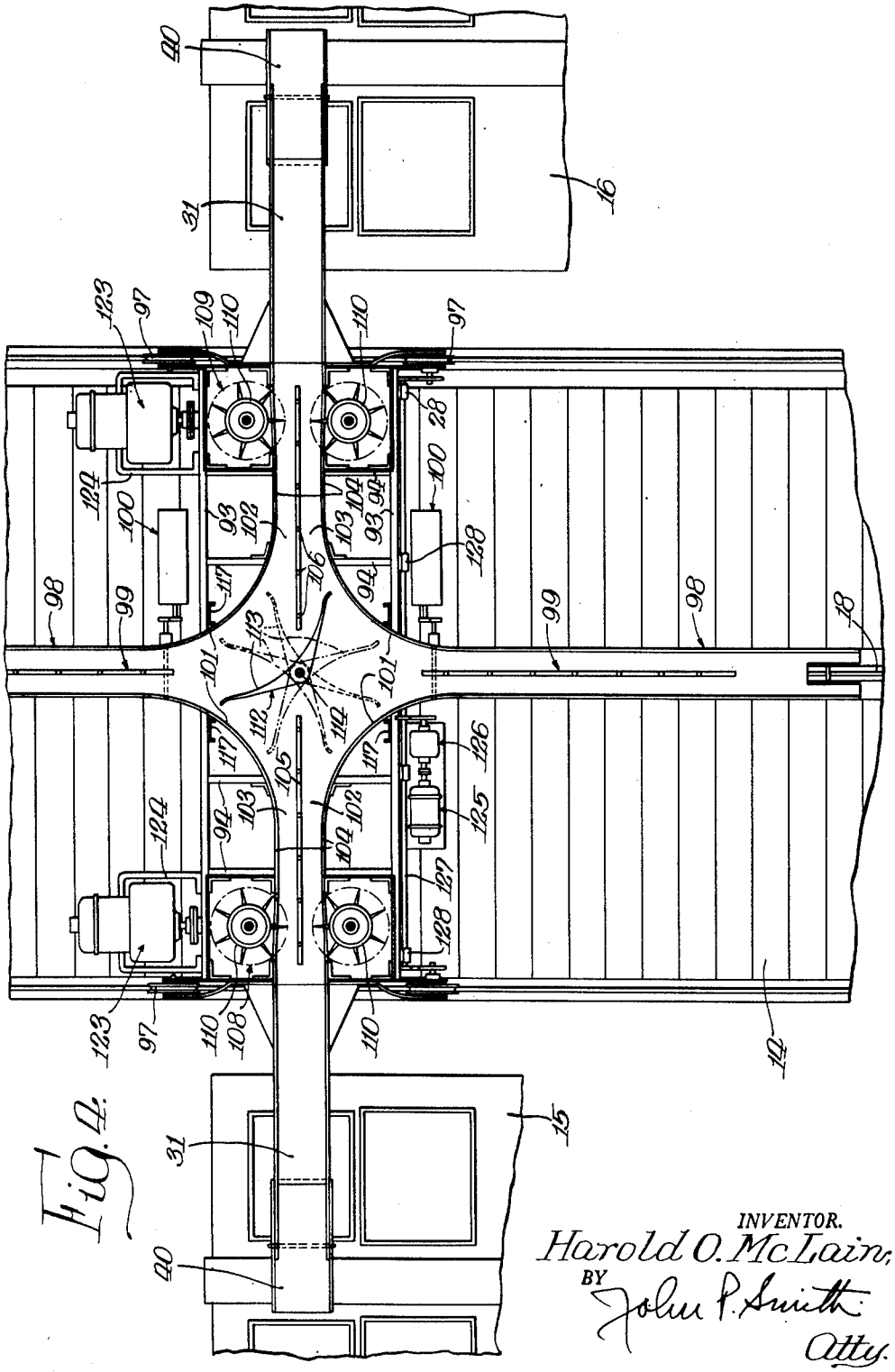


Fig. 4.

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ICING MACHINE

Filed Feb. 1, 1950 6 Sheets-Sheet 4

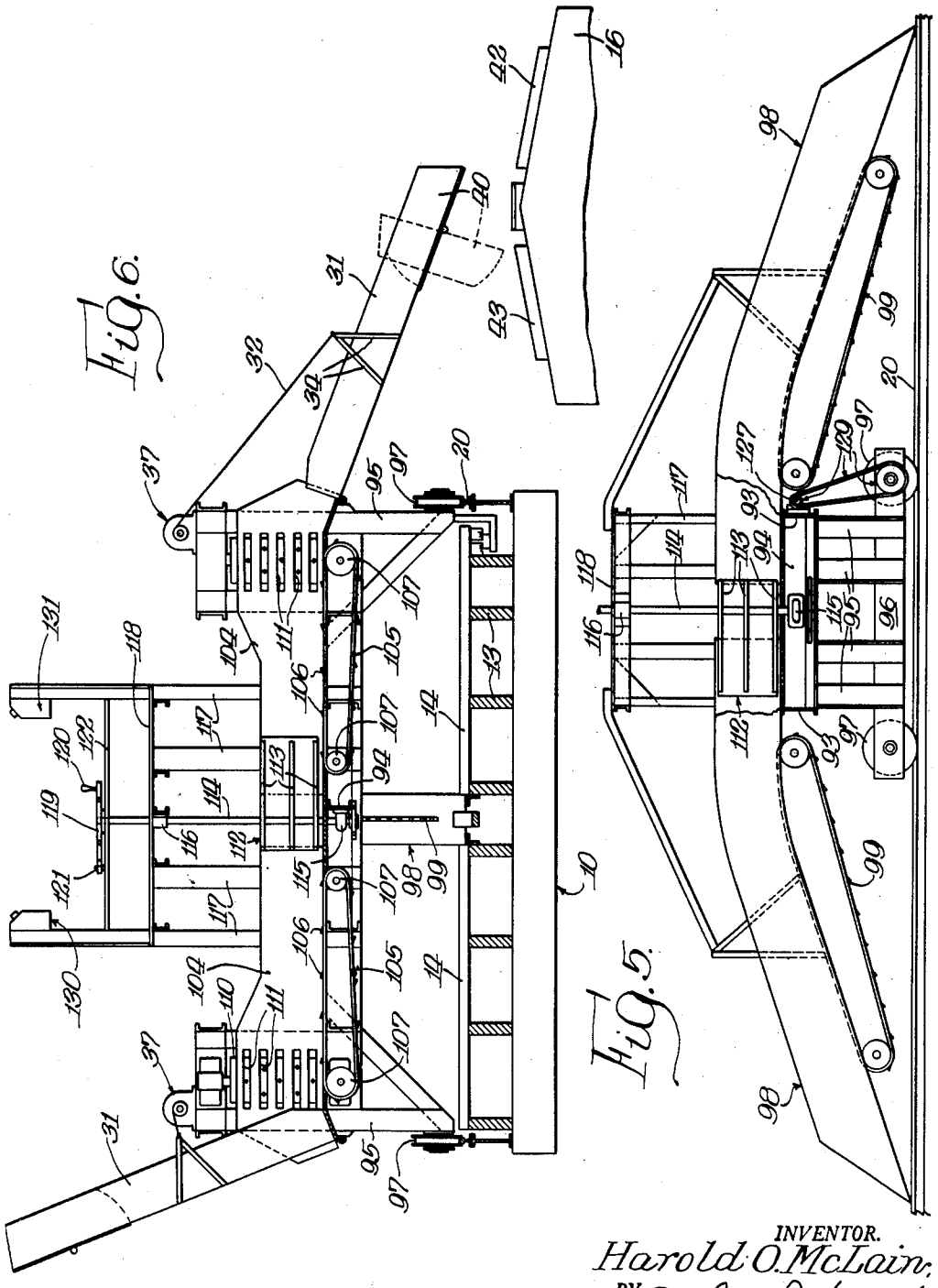


Fig. 6.

Fig. 5.

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ICING MACHINE

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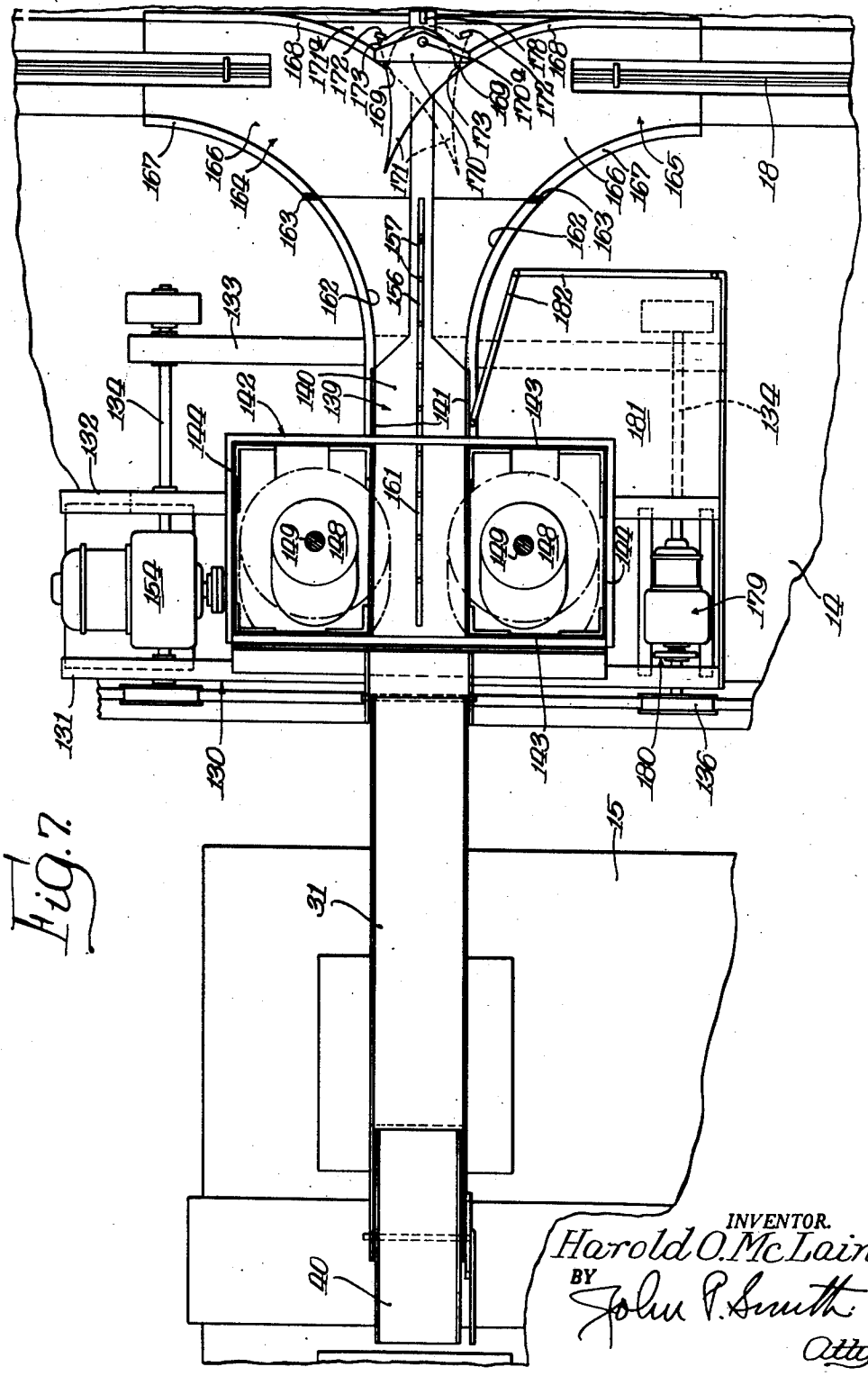


Fig. 7.

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ICING MACHINE

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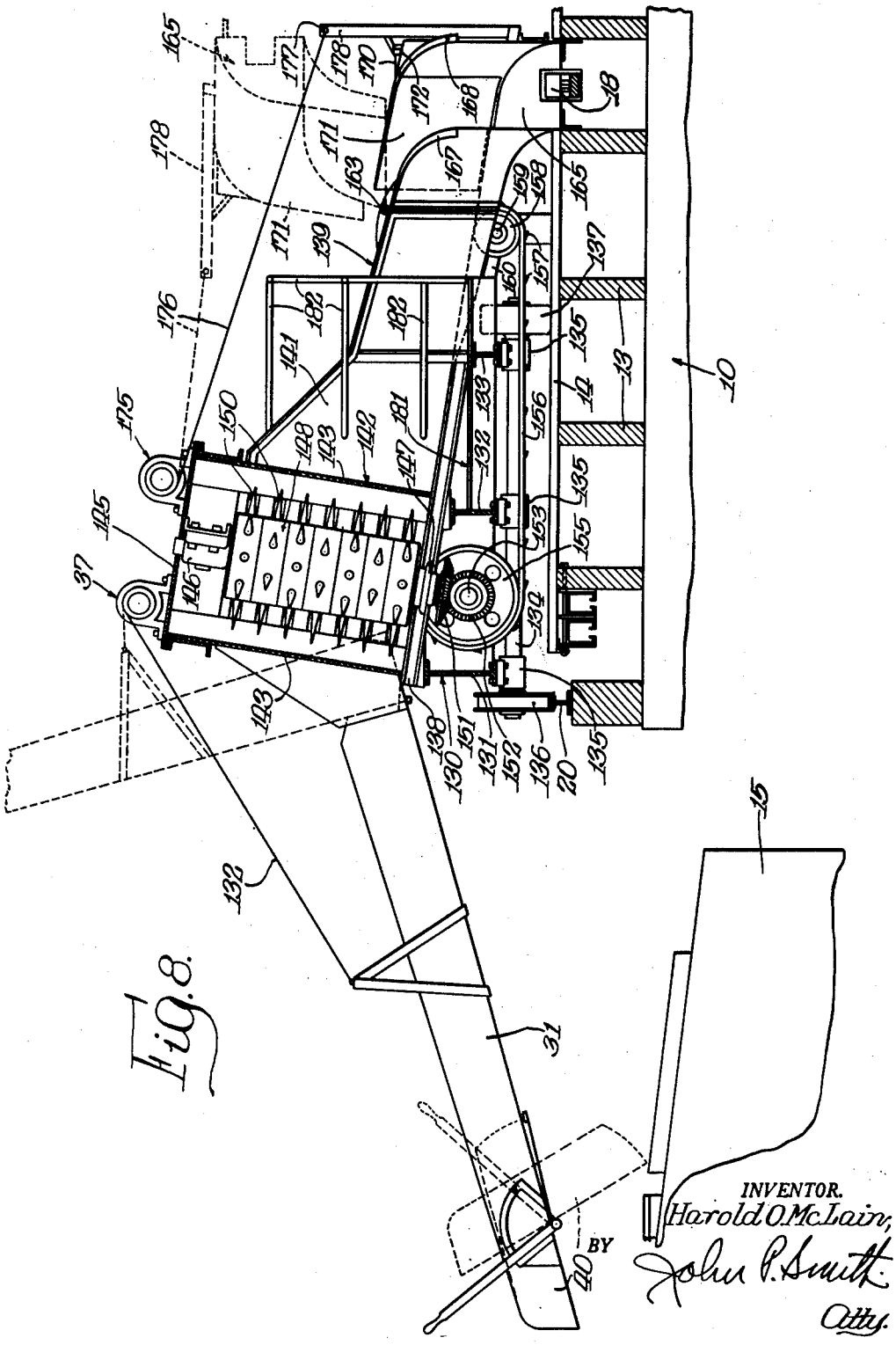


Fig. 8.

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Patented June 30, 1953 2,643,522

UNITED STATES PATENT OFFICE

2,643,522

ICING MACHINE

Harold O. McLain, Highland Park, Ill.

Application February 1, 1950, Serial No. 141,790

20 Claims. (Cl. 62—1)

1

The present invention relates generally to improvements in self-propelled or mobile icing machines for the servicing or icing of refrigerator cars or similar vehicles, but more particularly to a device adapted for use in connection with the conventional elevated icing platform so that ice blocks conveyed on and elevated from the platform to the device may be converted into chunked or crushed ice and delivered directly to the bunkers or ice chambers of the refrigerator cars.

Another object of the invention is to provide a novel and improved, as well as a self-contained icing machine adapted to move under its own power along a conventional elevated icing platform from where it will receive and elevate ice blocks conveyed therealong from either of two directions of travel of the machine and crush the ice blocks in suitable size chunks and discharge the ice chunks laterally from the machine in either direction to the ice bunkers of the refrigerator cars on the opposite sides of the platform.

A further object of the invention is to provide a novel, improved and compact construction of icing machine for the conventional elevated platform in which oppositely disposed and longitudinally extending ice block transferring mechanisms or elevating and conveying mechanisms are located on the opposite ends of the machine so that the icing machine may be propelled or operated in either direction of travel on the platform.

A still further object of the invention is to provide a novel and improved icing machine adapted to be propelled on longitudinally extending tracks on a conventional icing platform in which two longitudinally aligned and oppositely projecting ice blocks elevating and conveying mechanisms are adapted to convey the ice blocks on their narrow side up the elevating and conveying mechanisms to a centrally located and longitudinally aligned ice breaker and crusher mechanism which crushes the ice into suitable chunks and discharges it into transversely extending and laterally projecting chutes to the bunkers of refrigerator cars located on the opposite sides of the platform.

These and other objects are accomplished by providing a construction and an arrangement of the various parts in the manner hereinafter described and particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a top plan view of a portion of a conventional elevated icing platform showing my improved icing machine mounted thereon;

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Fig. 2 is a fragmentary side elevational view of the same;

Fig. 3 is an end elevational view of the construction shown in Figs. 1 and 2 with the longitudinally extending and oppositely disposed elevating and conveying mechanisms removed therefrom for the purpose of clearness;

Fig. 4 is a fragmentary top plan view of the conventional icing platform showing a modified form of my improved icing machine;

Fig. 5 is a side elevational view of the construction shown in Fig. 4 in which the laterally projecting crushed ice chutes are removed therefrom for the purpose of clearness;

Fig. 6 is an end elevational view of the modified form shown in Figs. 4 and 5 with the ice block elevating and conveying mechanism removed therefrom for the purpose of clearness;

Fig. 7 is a top plan view of a fragmentary portion of a conventional icing platform showing a second modification of an improved icing machine; and

Fig. 8 is an end elevational view of the modified form shown in Fig. 7.

My improved icing machine in the preferred form shown in Figs. 1, 2 and 3 of the drawings and in the two modified forms shown in Figs. 4, 5, 6, 7 and 8 of the drawings, is particularly adapted for use in connection with the conventional elevated platform or dock and the three forms in the present invention have special application for receiving and elevating the ice blocks from the conveyor of the conventional platform when the machine is moved in either direction on the platform, thereby dispensing with the necessity of providing two machines of the construction disclosed in my co-pending application, Serial No. 53,105, filed October 6, 1948, now Patent No. 2,587,872, granted March 4, 1952. All the forms of the present invention are especially suitable for use in connection with conventional type elevated platforms where the ice blocks are conveyed from ice storage plants to a central or intermediate point between the ends of the elevated platform. With this type of platform the ice block conveyor on the platform conveys the ice blocks in opposite directions from the intermediate or supply point of the platform so that under the circumstances, all the forms of the present invention can operate in either direction or on either side of the supply point of the elevated platform.

In the preferred form of my invention, as shown in Figs. 1, 2 and 3 of the drawings, the conventional elevated platform is illustrated in fragmentary form and is generally designated by the

reference character 10. The platform in this instance comprises briefly the usual supporting post 11 and transverse spaced apart beams 12. Secured to the transverse beams 12 are longitudinally spaced apart struts 13 to which are secured platform members 14. This elevated platform or dock reaches an elevational slightly above the tops of oppositely disposed railway refrigerator cars, generally indicated by the reference characters 15 and 16 located on the opposite sides of and extending parallel to the platform. The platform is provided with the usual two spaced apart ice block guide members 17, between which is a longitudinally extending endless chain conveyor 18 which conveys the ice blocks therealong by means of suitably spaced apart lugs 19. Located longitudinally of the platform adjacent the outer sides thereof are spaced apart tracks 20 on which my mobile icing machine is adapted to be propelled.

My preferred form of icing machine shown in Figs. 1, 2 and 3 of the drawings, comprises a main frame, generally indicated by the reference character 21. This main frame comprises two longitudinally extending and laterally spaced apart channel members 22 which have their forward and rear portions rigidly secured to vertically extending spaced apart pairs of posts 23 and 24. The lower ends of these posts 23 and 24 are provided with oppositely positioned horizontal channel members or bearing brackets 25. Journaled in suitable bearings between the channel brackets 25 are grooved wheels 26 which are adapted to engage the tracks 20 on the opposite sides of the platform. The opposite main frame members 22 are held in spaced apart braced relation by transverse channel members 27 on which is supported an operator's platform, generally indicated by the reference character 28. Extending between the inner posts 23 and 24 are longitudinally extending horizontal supplemental frame members 29. Pivotally secured to the opposite frame members 29 by means of oppositely disposed bearing brackets 30 are crushed ice chutes 31. The chutes 31 on the opposite sides of the icing machine may be adjusted from the full line position to the dotted line position shown in Fig. 3 by cables 32 which have their lower ends attached, as shown at 33, to the upper ends of the arms or brace members 34 which, in turn, are secured to the chutes 31. The other ends of the cables 32 are trained about windlasses 35 which are suitably supported on longitudinally extending horizontal channel members 36. Each of the windlasses is provided with a suitable electric motor, generally indicated by the reference character 37 for operating the same. Each of the horizontal channel members 36 is supported on the top ends of two spaced apart vertical members 38 which have their lower ends rigidly secured to the longitudinally extending channel members 22. Each of the motors 35 is provided with separate switch control, generally indicated by the reference character 39, which are secured to the vertical posts 38 in any well known manner. The lower ends of the chutes 31 are provided with the usual pivoted ice deflector trays, generally indicated by the reference character 40 and each is provided with an operating handle 41 so that the crushed ice may be discharged into either one of the hopper openings 42 or 43 of the respective refrigerator cars 15 or 16 on the opposite sides of the dock.

Positioned below and secured to the platform 28 and main frame of the icing machine, are two horizontally spaced apart and vertically extending plates 44 which are positioned on the opposite edges of substantially square opening in the platform above which an ice breaking and crushing mechanism hereinafter more fully described, is positioned. Positioned between the two plates 44 are oppositely disposed and outwardly diverging crushed ice troughs 45 of channel-like cross section which have their bottoms converging upwardly toward one another and meet at an apex, as shown at 46, at a point directly below the center of the ice breaking and crushing mechanism so that the crushed ice may fall by gravity into one or the other chutes through the medium of a gate hereinafter described. The outer ends of these troughs 45 are in alignment with their respective ice chutes 31 for discharging the crushed ice laterally of the icing machine. A pivoted gate 47 for diverting the crushed ice to either chute is secured to a shaft 48 which, in turn, is journaled in suitable apertures to the opposite plates 44. Secured to one end of the shaft 48 is a gear 49 which is adapted to mesh with the teeth of a reciprocating rack 50. The rack 50 is reciprocally mounted in guide brackets 51, which, in turn, are secured to one of the side plates 44. The rack bar 50 is provided with right angularly and upwardly extending arm 52 which extends through a longitudinal slot 53 in an extension of the platform 28. The upper end of the arm is provided with an operating handle 54 through the medium of which the rack bar may be actuated to swing the gate 47 through an arc of substantially 150° for directing the crushed ice into one or the other of the chutes.

One of the novel features of the present invention is the provision of oppositely disposed and longitudinally extending inclined ice block elevating and conveying mechanism in combination with a longitudinally and centrally disposed ice breaking and crushing mechanisms so that the icing machine may be operated in either direction on the elevated icing platform or dock for elevating and conveying the ice blocks to the ice crushing mechanism and discharge the ice in the hoppers of the refrigerator cars on either side of the platform. This novel arrangement includes two oppositely disposed and upwardly inclined elevating and conveying troughs, generally indicated by the reference characters 55 and 56. These conveyor troughs are preferably of the channel-like cross section and comprise upper and lower angle members 57 and 58 on the opposite sides thereof. A portion of the angle members 57 and 58 are curved, as shown at 59, and terminate in an inclined slope as shown at 60 to a point adjacent the ice breaking and crushing mechanism, generally indicated by the reference character 61. These elevating and conveying troughs 55 and 56 are provided with opposite side walls 62 and bottoms 63. Mounted throughout substantially the entire inclined portion of the conveyor troughs 55 and 56 are two spaced apart endless conveyor belts 64. The conveyor belts are provided with the usual sharp ice block engaging lugs 65 which are uniformally spaced apart throughout the entire length of the belts. The elevating and conveying belts 64 for each of these troughs 55 and 56 are trained about rollers 66 at their lower ends, which, in turn, are journaled in suitable brackets 67 secured to the lower opposite angle members 58. The upper portions of each of the endless conveyor and elevator belts 64 are trained about spaced apart sprocket wheels 68. The sprocket wheels 68 are secured

to transverse shafts 69 which, in turn, are journaled in the upper ends of spaced apart pairs of vertical posts 70, the lower ends of which are secured to the opposite longitudinally extending main frame channel members 27. The upper ends of these opposite pairs of posts 70 are secured to and form supports for the oppositely disposed elevating conveying troughs 55 and 56 as clearly shown in Fig. 2 of the drawings. Secured to each of the shafts 69 are sheaves 71 about which are trained drive belts 72. The belts 72 are trained about pulleys or drive sheaves which are mounted on one end of a drive shaft of each of the electric motors, generally indicated by the reference character 73. These electric motors are mounted on the opposite sides of the platform 28 and can be individually controlled from the operator's station on the machine in the manner well understood in the art. The opposite ends of the ice block elevator troughs 55 and 56 are each provided with oppositely disposed carrying wheels, generally indicated by the reference character 74.

Another essential feature of the present invention involves the position and location of the ice breaking and crushing mechanism 61 which is located substantially in the center of the machine and in longitudinal alignment with the oppositely disposed longitudinally extending elevating and conveying troughs 55 and 56 so that the ice blocks may be transferred from the ice block platform conveyor to either of these troughs from either direction and conveyed upwardly in these inclined troughs beyond the curved portions 59 of each of the troughs and then moved by gravity into either side of the ice breaking and crushing mechanism 61 for crushing the ice into chunks and discharging the same into either one of the oppositely disposed troughs 45 from where it is discharged through the chutes to the hoppers of the refrigerator cars on either side of the platform. The ice breaking and crushing mechanism in this instance comprises a frame structure which includes two oppositely disposed vertical sides 75 and a transverse top 76. The ice crusher in this instance comprises briefly, two horizontally spaced apart and vertically extending pronged cylinders, generally indicated by the reference character 77 and 78. Each of these cylinders 77 and 78 are secured to vertical shafts 79 which are journaled in suitable bearings secured to two spaced apart transverse channel members 80. Secured to the upper ends of each of the cylinder shafts 79 are bevelled gears 81 which mesh with and are adapted to be operatively driven by beveled pinions 82. The pinions 82 are secured to a shaft 83 of a reversible driving electric motor, generally indicated by the reference character 84. The motor 84 is mounted on a suitable support on the top 76 of the ice breaker and crusher housing 61.

It will be readily seen that by having two oppositely disposed elevating and conveying troughs 55 and 56 in alignment with a centrally located ice breaking and crushing mechanism located therebetween, the icing machine may be propelled in either direction and elevate ice blocks on their narrow long side directly to the crushing mechanism, from where the crushed ice can be distributed laterally from the machine to either side of the same to the bunkers of the refrigerator cars on the opposite sides of the elevator platform.

The icing machine is propelled on the tracks 20 on the platform 10 by an electric motor, generally indicated by the reference character 85 which is geared to and operatively drives a transverse shaft 86 by a drive belt 87. The drive belt, in turn, is trained about a sheave 88 secured to the shaft 86. The shaft 86 is journaled in suitable bearings secured to the opposite frame members 22. Secured adjacent the outer ends of the shaft 86 are sprocket wheels 89 about which is trained drive chains 90. The drive chains 90, in turn, are trained about sprocket wheels 91 which, in turn, are secured to shafts 92. The shafts 92 are journaled in the opposite channel members 25. Secured to the shaft 92 are two of the carrying wheels 26 which are adapted to engage the tracks for propelling the machine in either direction on the platform.

In the first modified form, substantially the same ice block elevating and conveying mechanism which elevates the ice blocks from the platform to the icing machine proper are arranged in oppositely disposed position similar to the machine of the preferred form. The elevated platform or dock construction and similar parts in the modified form carry the same reference characters as those in Figs. 1, 2 and 3 of the drawings. In this modified form shown in Figs. 4, 5 and 6 of the drawings, the main frame includes two spaced apart transversely extending horizontal main frame members 93 reinforced and secured together by a plurality of laterally spaced apart longitudinal frame members 94. Depending from the outside frame members 94 on each side of the machine are vertically depending spaced apart legs or angle members 95 which are secured to laterally spaced apart horizontal truck frame members 96. Journaled between the truck frame members 96 are the usual carrying or track wheels 97 which are adapted to engage the tracks 20 on the opposite sides of the platform 10. Extending in opposite directions from the center of the machine and in alignment with the ice block platform conveyor 18, are two oppositely disposed and upwardly inclined elevating and conveying troughs 98 which are similar to and perform similar functions as the conveying troughs 55 and 56 in Figs. 1, 2 and 3 of the drawings of the preferred form. These conveying troughs are provided with the usual conveying mechanism, generally indicated by the reference character 99, each of which are operatively driven in a manner well understood in the art by separate electric motors, generally indicated by the reference character 100. The upper ends of the opposite side walls of each of the elevating and conveying troughs 98 diverge and curve outwardly, as shown at 101, at points approaching the center of the main frame of the machine and form in effect two oppositely and laterally projecting troughs, as shown at 102. These troughs 102 are channel shape in cross section and are formed by bottoms 103 and opposite side walls 104. Mounted in each of these troughs 102 is an endless conveyor belt, generally indicated by the reference character 105. The oppositely disposed ice block conveyor belts 105 are provided with the usual lugs 106 for conveying the ice blocks therealong. Each of the conveyor chains 105 are trained about suitable sprocket wheels 107 and one of these sprocket wheels for each conveyor chain is operatively driven by a separate electric motor (not shown) in any well known manner.

One of the novel features of this modified form is the positioning of separate ice breaking

and crushing mechanisms at locations adjacent the outer sides of the icing machine and having a centrally located ice block deflector or gate which can be adjusted for deflecting the ice blocks coming up from the ice block elevating and conveying mechanisms on either end of the machine. This gate deflects the ice blocks laterally to the separate or individual ice block breaking and crushing mechanism and then discharges the crushed ice laterally into the hoppers of the adjacent railway refrigerator cars on the opposite sides of the platform. This mechanism comprises two separate ice breaking and crushing mechanisms, generally indicated by the reference characters 108 and 109. These ice breaking and crushing mechanisms comprise two horizontally spaced and vertically extending pronged cylinders 110. These cylinders 110 are positioned on the opposite sides of each of the troughs 102 so that the prongs thereof are adapted to protrude through a plurality of vertically spaced apart slots 111 in the opposite side walls 104 of the troughs 102. The prongs of these cylinders 110 are adapted to project into the path of the ice blocks and crush the ice therebetween into uniform chunks before discharging it into the chutes 31 from where it is conveyed into the hopper of the refrigerator cars. In order to deflect the ice blocks laterally from either of the oppositely disposed ice block elevating and conveying mechanisms 99, a centrally located deflector or gate, generally indicated by the reference character 112 is provided. The gate 112 is located in the center of the machine and in the path of travel of the ice blocks being elevated by either elevating mechanism. This deflector or gate 112 comprises a plurality of vertically spaced apart curved arms 113 which are secured to a vertically extending shaft 114. Journaled in suitable bearings 115 and 116 secured to the main frame. Vertically extending posts 117 supports an operator's station or platform 118. Secured to the upper end of the shaft 114 is a hand wheel 119 which is provided with an operating handle 120 and a spring latch, generally indicated by the reference character 121, carried by a transverse bar 122 locks the wheel in various positions of adjustment for securing the gate in any one of the four positions.

The ice breaking and crushing mechanisms 108 are provided with separate electric motors, generally indicated by the reference character 123, which are supported on U-shaped supplemental frame members 124 which, in turn, are secured to the opposite main frame members 93. The machine is propelled along the tracks 20 of the platform 10 by an electric motor and a reduction gearing mechanism indicated respectively by the reference characters 125 and 126. This transmission mechanism is geared to and operatively drives a transverse shaft 127 which is mounted in suitable bearings 128 secured to one of the main frame members 93. The shaft is geared to two of the traction wheels 97 by suitable sheaves and an endless belt, generally indicated by the reference character 129. Suitable separate control boxes, generally indicated by the reference characters 130 and 131, are mounted on the upper end of certain of the vertical posts 117 so that easy access thereto may be had from the operator's platform or station 118 on the machine.

From the above description it will be obvious that this modified form, like the construction shown in Figs. 1, 2 and 3 of the drawings, can be moved and operated in either direction on the platform 10 and can pick up the ice blocks and elevate them and direct them to the icing machine proper from either end thereof. This particular feature is, of course, common to both forms thus far described. The distinguishing feature of this modified form is that the ice blocks can be diverted laterally in either direction from either elevating mechanism to the separate and laterally positioned ice breaking and crushing mechanism from where the crushed ice is discharged through the chutes to the hoppers on the refrigerator cars on either side of the platform.

In the second modified form of my invention shown in Figs. 7 and 8 of the drawings, the feature common to all these forms includes the oppositely disposed elevating or transferring mechanism which permits the machine to operate in either direction for picking up the ice blocks from the platform to the ice crushing and breaking mechanism. In this last modification, the machine comprises a main frame, generally indicated by the reference character 130. This main frame comprises three laterally spaced apart and longitudinally extending main frame I-beams 131, 132 and 133 of different height or elevation. Journaled on the lower side of these I-beams are two transversely extending spaced apart axles 134 which are journaled in bearing brackets 135 secured to the I-beams. Secured to the outer ends of the shaft 134 are grooved wheels 136 which are adapted to engage one of the tracks 20 of the platform 10. The other ends of the axles 134 have secured thereon flat wheels 137 which are adapted to ride on the flat platform 14 of the dock 10. Supported on top of the I-beam frame members 131, 132 and 133 are inclined channel supplemental frame members 138. Supported on the inclined channel members 138 is an inclined ice block conveying trough, generally indicated by the reference character 139 which is arranged transversely with respect to the longitudinal direction of the travel of the machine. This trough 139 is substantially U-shaped in cross section and comprises an inwardly and downwardly inclined bottom 140 and opposite vertical side walls 141. Mounted adjacent the outer end of the trough 139 is an ice breaking and crushing mechanism, generally indicated by the reference character 142. This ice breaking and crushing mechanism comprises a slightly inclined rectangular housing which includes opposite side members 143, enclosure members 144 and a top closure member 145. Journaled in suitable upper and lower bearings 146 and 147 respectively, are two laterally spaced apart ice crushing prong cylinders, generally indicated by the reference character 148. These cylinders 148 are secured to and are rotatably driven by shafts 149 whose axes are inclined at an angle with respect to the vertical so as to be at right angles with respect to the plane of the bottom 140 on the trough 139. The prongs of these cylinders project through suitable slots 150 located in the opposite sides 141 of the trough 139 so as to project into the path of travel of the ice blocks for crushing the same. Each of the shafts 149 are provided with bevelled gears 151 (only one of which is shown) which mesh with and are operatively driven by bevelled gears 152 which, in turn, are secured to a longitudinally extending shaft 153. The shaft 153 is journaled in suitable bearings on the main frame (not shown) and is operatively driven by an electric motor,

generally indicated by the reference character 154. The electric motor 154 is suitably supported on the I-beams 131, 132 and 133, as clearly shown in Fig. 7 of the drawings. Secured to the shaft 153 in alignment with the transverse center of the trough 139 is a drive sprocket wheel or sheave 155 about which is trained an endless conveyor belt 156. The belt 156 is provided with spaced apart ice block engaging lugs 157. The inner end of the belt is trained about a pulley or wheel 158. The pulley 158 is journaled on a shaft 159 which, in turn, is suitably supported in bearing brackets 160 secured to the main frame of the machine. The bottom 140 of the trough 139 is provided with a longitudinally extending slot 161 through which the lugs 157 project in engaging and conveying the ice blocks therealong. The side walls 141 of the trough 139 diverge outwardly in the arc of a circle, as shown at 162, and the upper inner edges thereof form a longitudinally aligned pivotal support or hinge, as shown at 163, for pivotally supporting two oppositely diverging ice block transferring troughs, generally indicated by the reference characters 164 and 165. These transferring troughs 164 and 165 have their receiving ends in longitudinal alignment with the ice block conveying mechanism 18 of the platform 10 as disclosed in Figs. 7 and 8 of the drawings, so that the machine may be moved in either direction on the platform 10 to transfer or elevate and convey ice blocks from the platform to the ice breaking and crushing mechanism in the manner hereinafter described. These ice block transferring troughs 164 and 165 are rigidly secured together as an integral member and comprise upwardly inclined and curved bottoms 166 and inner curved vertical side walls 167 which, in effect, are a continuation of the arc of the same circle of the curved walls 162 of the trough 139. The other walls of the ice block transferring troughs 164 and 165 are arcuately curved toward the machine as shown at 168 and terminate, as shown at 169, at points spaced from one another. Secured to the top edges of the curved walls 168 and the bottom edges thereof are two vertically spaced apart substantially triangular plates 170 to which are pivotally attached at 170a a curved pointed deflector or gate 171. When the ice blocks are conveyed or transferred from the platform conveyor chain 18 of the dock 10 to the transfer trough 164 or 165, the next succeeding ice block will force the previous one forward and the curved gate will be actuated to the full line position or dotted line position, depending on which way the ice block is being conveyed toward the machine. The gate 171 will then, obviously, deflect the ice block into the trough 139, where it will be engaged by the conveyor chain 156 and conveyed toward the ice crushing and breaking mechanism 142. Stops or lugs 172 are located on the opposite sides to engage opposite projections 173 on the gate 171 to limit the pivotal movement thereof so as to properly direct the ice blocks in their path of travel. These lugs 172 are secured to a reinforcing angle 174 secured to the outside of the transfer troughs 164 and 165.

If the operator desires to displace or lift the conveyor troughs 164 and 165, a windlass, generally indicated by the reference character 175, may be actuated. The windlass may be operated by a suitable electric motor (not shown) secured to and mounted on the top 145 of the housing. This windlass is mounted on the top 145 of the ice breaker and crusher 142 and is provided with a cable 176 which is connected, as shown at 177, to an arm 178 which, in turn, is secured to reinforcing frame member 172 of the transfer troughs 164 and 165. Obviously if the operator desires to raise or elevate the transfer troughs 164 and 165 from the full line position shown in Fig. 8 to the dotted line position shown therein, the windlass 175 may be actuated for accomplishing this purpose.

An electric motor, generally indicated by the reference character 179, is suitably supported on the I-beams 131 and 132 of the main frame and connected by suitable gearing, generally shown at 180, for operatively driving the shaft 134 for propelling the icing machine longitudinally of the dock in either direction.

An operator's platform, generally indicated by the reference character 181, is surrounded by vertical and horizontal guard rails 182. Suitable control means (not shown) may be positioned on the platform for controlling the operation of all of the motors.

From the above description it will be readily seen that the device disclosed in this second modified form, as shown in Figs. 7 and 8 of the drawings, provides a very simple, compact and relatively low ice crushing machine and one which will extend only over one-half the normal width of the elevated platform, but at the same time, can be propelled or operated in either direction to transfer the ice blocks from the ice block conveyor chain on the platform when the machine is moved in either direction of the platform.

Summarizing the advantages and functions of operation of the preferred form and the two modifications of my invention as disclosed in the drawings, it will immediately be apparent that by providing a machine which is capable of operating in either direction on the conventional dock or elevated platform so as to transfer the ice blocks from the platform to the ice crushing and breaking mechanism, the machine may be used in a wide range of situations and unusual conditions encountered in ice servicing stations throughout the country. The icing machine of the present invention is not only a universal one, but one which will dispense with the necessity of requiring two machines of the type heretofore constructed. The machine of the present invention effects a major saving in the equipment and accomplishes a simplification of the structure as well as economy in operation.

While in the above specification I have described one preferred embodiment and two modifications which my invention may assume in practice, it will, of course, be understood that other modifications may be made without departing from the spirit and scope of the invention as expressed in the following claims.

What I claim as my invention and desire to secure by Letters Patent is:

1. A refrigerator car icing machine comprising a portable main frame movable on tracks between oppositely disposed trains of refrigerator cars to be iced, two oppositely disposed ice block transferring means carried by said main frame, an ice breaking and crushing unit carried by said frame, and a laterally disposed distributing means carried by said frame for discharging the crushed ice from the ice breaking and crushing unit laterally of said machine to the bunkers of

the refrigerator cars on the opposite sides of said machine.

2. A refrigerator car icing machine comprising a longitudinally extending wheeled main frame movable on tracks between oppositely disposed trains of refrigerator cars to be iced, two longitudinally extending and oppositely disposed aligned ice block conveying and guiding means carried by said main frame, an ice breaking and crushing mechanism mounted on said main frame, and a laterally disposed distributing means carried by said frame for receiving the ice crushed by said ice breaking and crushing mechanism and discharging the same laterally of said machine to the bunkers of the refrigerator cars on the opposite sides of said machine.

3. A refrigerator car icing machine comprising a wheeled main frame movable between two lines of refrigerator cars to be iced, two oppositely disposed ice block transferring troughs mounted on said frame and extending in longitudinal alignment with one another for guiding ice blocks toward said machine, ice breaking and crushing mechanism mounted on said frame for crushing the ice blocks into suitable crushed chunks, and oppositely disposed chutes carried by said frame for receiving the crushed ice from said breaking and crushing mechanism and discharging the crushed ice laterally of said machine into the bunkers of said refrigerator cars on the opposite sides of said machine.

4. A refrigerator car icing machine comprising a wheeled frame movable between two lines of refrigerator cars to be iced, upwardly inclined transferring troughs mounted on the opposite ends of said frame for conveying and guiding ice blocks toward the transverse center of said machine, ice breaking and crushing mechanism mounted on said wheeled frame for crushing the ice blocks into uniform ice chunks, and oppositely disposed chutes pivoted on said wheeled frame for receiving the crushed ice from the ice breaking and crushing mechanism and discharging the crushed ice laterally of said machine into the bunkers of said refrigerator cars on the opposite sides of said machine.

5. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between two trains of refrigerator cars to be iced, upwardly inclined ice block transferring troughs mounted on the opposite ends of said wheeled frame and located in longitudinal alignment with one another for transferring ice blocks onto said machine from either direction of movement of the machine, ice breaking and crushing mechanism mounted on said wheeled frame for crushing the ice into uniform sized chunks, and laterally extending ice chutes pivoted to said wheeled frame for receiving the crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of the machine into the bunkers of the refrigerator cars on the opposite sides of said machine.

6. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between two trains of refrigerator cars to be iced, upwardly inclined ice block transferring troughs mounted on the opposite ends of said wheeled frame and located in longitudinal alignment with one another for transferring ice blocks onto said machine from either direction of movement of the machine, ice breaking and crushing mechanism mounted on said wheeled frame and located in longitudinal alignment with said troughs for crushing the ice into uniform sized chunks, and transversely extending chutes pivoted to the opposite sides of said wheeled frame for receiving the crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of said machine into the bunkers of the refrigerator cars on the opposite sides of said machine,

7. A refrigerator car icing machine comprising a wheeled frame, movable longitudinally between two trains of refrigerator cars to be iced, upwardly inclined transferring troughs mounted on the opposite ends of said wheeled frame and located in longitudinal alignment with one another for conveying and guiding ice blocks toward the transverse center of said machine, ice breaking and crushing mechanism mounted on said wheeled frame and located in longitudinal alignment with said troughs for crushing the ice into uniform chunks, and transversely extending chutes pivoted to the opposite sides of said wheeled frame for receiving the crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of said machine into the bunkers of the refrigerator cars on the opposite sides of said machine.

8. A refrigerator car icing machine comprising a wheeled frame movable on tracks between two trains of refrigerator cars to be iced, upwardly inclined transferring troughs mounted on the opposite ends of said wheeled frame and located in longitudinal alignment with one another for conveying and guiding ice blocks toward the transverse center of said machine, ice breaking and crushing mechanism mounted on said wheeled frame and located in longitudinal alignment with said troughs for crushing the ice into uniform chunks, transversely extending chutes pivoted to the opposite sides of the wheeled frame and having their upper ends converging in an apex beneath said ice breaking and crushing mechanism for discharging the crushed ice laterally of said machine and into the bunkers of the refrigerator cars on either side of said machine, and a swinging gate mounted adjacent the apex of said chutes for directing the crushed ice into either of said chutes.

9. A refrigerator car icing machine comprising a wheeled frame movable on tracks between two trains of refrigerator cars to be iced, upwardly inclined and longitudinally extending ice block transferring troughs mounted on the opposite ends of the wheeled frame for conveying and guiding ice blocks on said machine, transverse ice block troughs mounted on said wheeled frame and connected to said first named troughs to receive ice blocks from either of the two first mentioned troughs, ice breaking and crushing mechanisms mounted in each of the transverse troughs, and laterally projecting chutes pivoted to said wheeled frame for receiving crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of said machine and into the bunkers of the refrigerator cars on either side of said machine.

10. A refrigerator car icing machine comprising a wheeled frame movable on tracks between two trains of refrigerator cars to be iced, upwardly inclined and longitudinally extending ice block transferring troughs mounted on the opposite ends of the wheeled frame for conveying and guiding ice blocks on said machine, transverse ice block troughs mounted on said wheeled frame and connected to said first named troughs to receive ice blocks from either of the two first mentioned troughs, ice breaking and crushing

mechanisms mounted in each of the transverse troughs, laterally projecting chutes pivoted to said wheeled frame for receiving crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of said machine and into the bunkers of the refrigerator cars on either side of said machine, and a deflector mounted on said wheeled frame at the intersection of all of said troughs for deflecting ice blocks from either of the inclined troughs to either of the transverse troughs.

11. A refrigerator car icing machine comprising a wheeled frame movable on tracks between two trains of refrigerator cars to be iced, upwardly inclined and longitudinally extending ice block transferring troughs mounted on the opposite ends of the wheeled frame for conveying and guiding ice blocks on said machine, transverse ice block troughs mounted on said wheeled frame and connected to said first named troughs to receive ice blocks from either of the two first mentioned troughs, ice breaking and crushing mechanisms mounted in each of the transverse troughs, laterally projecting chutes pivoted to said wheeled frame for receiving crushed ice from said ice breaking and crushing mechanism and discharging the same laterally of said machine and into the bunkers of the refrigerator cars on either side of said machine, and an adjustable deflector mounted on said wheeled frame and located in the path of travel of the ice blocks for directing the ice blocks into either of the ice breaking and crushing mechanisms.

12. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between oppositely disposed lines of refrigerator cars to be iced, upwardly inclined and longitudinally extending troughs mounted on the opposite ends of said frame, a conveyor mounted in each of said troughs for conveying ice blocks thereon, oppositely disposed transverse troughs forming lateral extensions of said first named troughs, conveyors mounted in each of said transverse troughs, a deflector mounted on said frame and located in the path of travel of the ice blocks for deflecting the ice blocks laterally in either direction from either of the longitudinal troughs, an ice breaking and crushing mechanism mounted adjacent the outer ends of each of the transverse troughs for crushing ice blocks into chunks of uniform size, and oppositely disposed ice chutes pivoted to the opposite sides of said frame below each of said ice breaking and crushing mechanisms for discharging the crushed ice laterally in either direction from said machine into the bunkers of the refrigerator cars on either side of said machine.

13. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between oppositely disposed lines of refrigerator cars to be iced, conveying and elevating means mounted on the opposite ends of said frame for conveying and elevating ice blocks onto said frame from either end thereof whereby the machine may operate in either direction of travel, transversely and oppositely disposed conveying mechanisms mounted on said frame for conveying the ice blocks laterally in either direction from said first named conveying and elevating means, ice breaking and crushing mechanisms mounted adjacent the delivery ends of each of the transversely disposed conveying mechanisms, and laterally extending chutes pivotally connected to said frame for discharging the crushed ice laterally of said machine into the bunkers of the refrigerator cars on either side of said machine.

14. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between oppositely disposed lines of refrigerator cars to be iced, conveying and elevating means mounted on the opposite ends of said frame for conveying and elevating ice blocks onto said frame from either end thereof whereby the machine may operate in either direction of travel, transversely and oppositely disposed conveying mechanisms mounted on said frame for conveying the ice blocks laterally in either direction from said first named conveying and elevating means, ice breaking and crushing mechanisms mounted adjacent the delivery ends of each of the transversely disposed conveying mechanisms, laterally extending chutes pivotally connected to said frame for discharging the crushed ice laterally of said machine into the bunkers of the refrigerator cars on the opposite sides of said machine, and a movable gate mounted on said frame and located in the path of travel of the ice blocks for deflecting the ice blocks laterally from either of said elevating and conveying means to either of the transversely disposed conveying mechanisms.

15. A refrigerator car icing machine comprising a wheeled frame movable longitudinally between oppositely disposed lines of refrigerator cars to be iced, conveying and elevating means mounted on the opposite ends of said frame for conveying and elevating ice blocks onto said frame from either end thereof whereby the machine may operate in either direction of travel, transversely and oppositely disposed conveying mechanisms mounted on said frame for conveying the ice blocks laterally in either direction from said first named conveying and elevating means, ice breaking and crushing mechanisms mounted adjacent the delivery ends of each of the transversely disposed conveying mechanisms, laterally extending chutes pivotally connected to said frame for discharging the crushed ice laterally of said machine into the bunkers of the refrigerator cars on the opposite sides of said machine, an operator's station mounted on said frame, and means operable from said station and connected to said gate for adjusting said gate and controlling the direction of travel of the ice blocks on said machine.

16. A refrigerator car icing machine comprising a wheeled frame movable in either of two directions parallel to and adjacent a train of refrigerator cars to be iced, oppositely disposed and upwardly inclined ice block transferring troughs mounted on said wheeled frame, a laterally extending and upwardly inclined ice block conveying trough communicating with said first named troughs for receiving ice blocks from either of said first named troughs and conveying them laterally of said machine, an ice breaking and crushing mechanism mounted on the outer end of said laterally extending trough for crushing the ice conveyed thereto, and a laterally extending chute pivoted on said wheeled frame for discharging the crushed ice laterally of said machine into the bunkers of the adjacent train of refrigerator cars.

17. A refrigerator car icing machine comprising a wheeled frame movable in either of two directions parallel to and adjacent a train of refrigerator cars to be iced, oppositely disposed and upwardly inclined ice block transferring troughs mounted on said wheeled frame, a later-

ally extending and upwardly inclined ice block conveying trough communicating with said first named troughs for receiving ice blocks from either of said first named troughs and conveying them laterally of said machine, an ice breaking and crushing mechanism mounted on the outer end of said laterally extending trough for crushing the ice conveyed thereto, a laterally extending chute pivoted on said wheeled frame for discharging the crushed ice laterally of said machine into the bunkers of the adjacent train of refrigerator cars, and means for pivotally connecting the oppositely disposed troughs whereby said last named trough may be displaced with respect to the other troughs.

18. A refrigerator car icing machine comprising a wheeled frame movable in either of two directions parallel to and adjacent a train of refrigerator cars to be iced, oppositely disposed and upwardly inclined ice block transferring troughs mounted on said wheeled frame, a laterally extending and upwardly inclined ice block conveying trough communicating with said first named troughs for receiving ice blocks from either of said first named troughs and conveying them laterally of said machine, an ice breaking and crushing mechanism mounted on the outer end of said laterally extending trough for crushing the ice conveyed thereto, a laterally extending chute pivoted on said wheeled frame for discharging the crushed ice laterally of said machine into the bunkers of the adjacent train of refrigerator cars, and longitudinally extending aligned hinges pivotally connecting the oppositely disposed troughs to said laterally extending trough whereby said last named trough may be displaced with respect to said machine.

19. A refrigerator car icing machine comprising a wheeled frame movable in either of two directions parallel to and adjacent a train of refrigerator cars to be iced, oppositely directed and longitudinally extending transferring means mounted on said frame for guiding ice blocks onto said machine, a laterally extending guiding means mounted on said frame for receiving ice blocks from either of said first named means, an endless conveyor mounted in said laterally extending guiding means for conveying ice blocks laterally of said machine, ice breaking and crushing mechanism located at the outer end of the laterally extending guiding means for crushing the ice blocks into uniform sized chunks, and a laterally extending chute pivoted to said frame for delivering the crushed ice laterally of said machine into the bunkers of the adjacent train of refrigerator cars.

20. A refrigerator car icing machine comprising a wheeled frame movable in either of two directions parallel to and adjacent a train of refrigerator cars to be iced, oppositely directed and longitudinally extending transferring means mounted on said frame for guiding ice blocks onto said machine, a laterally extending guiding means mounted on said frame for receiving ice blocks from either of said first named means, an endless conveyor mounted in said laterally extending guiding means for conveying ice blocks laterally of said machine, ice breaking and crushing mechanism located at the outer end of the laterally extending guiding means for crushing the ice blocks into uniform sized chunks, a laterally extending chute pivoted to said frame for delivering the crushed ice laterally of said machine into the bunkers of the adjacent train of refrigerator cars, and a deflector mounted between the opposite transferring means and located in the path of travel of said ice blocks for directing the ice blocks from either of said opposite transferring means to the laterally extending guiding means.

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