Feb. 17, 1953 H. O. McLAIN 2,628,477

MASTER CAR ICING MACHINE

Filed July 12, 1950 3 Sheets-Sheet 1

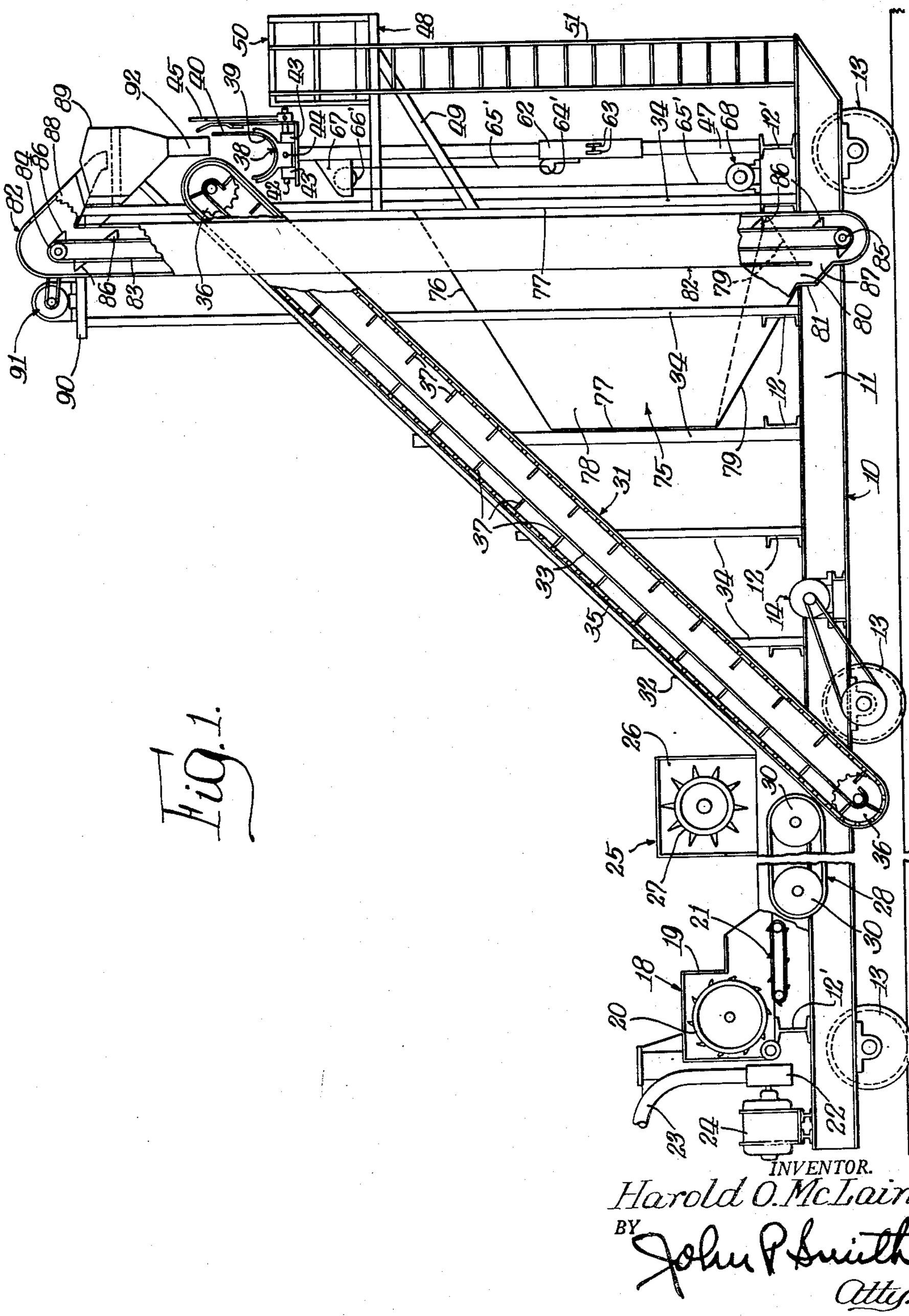

Fig. 1.

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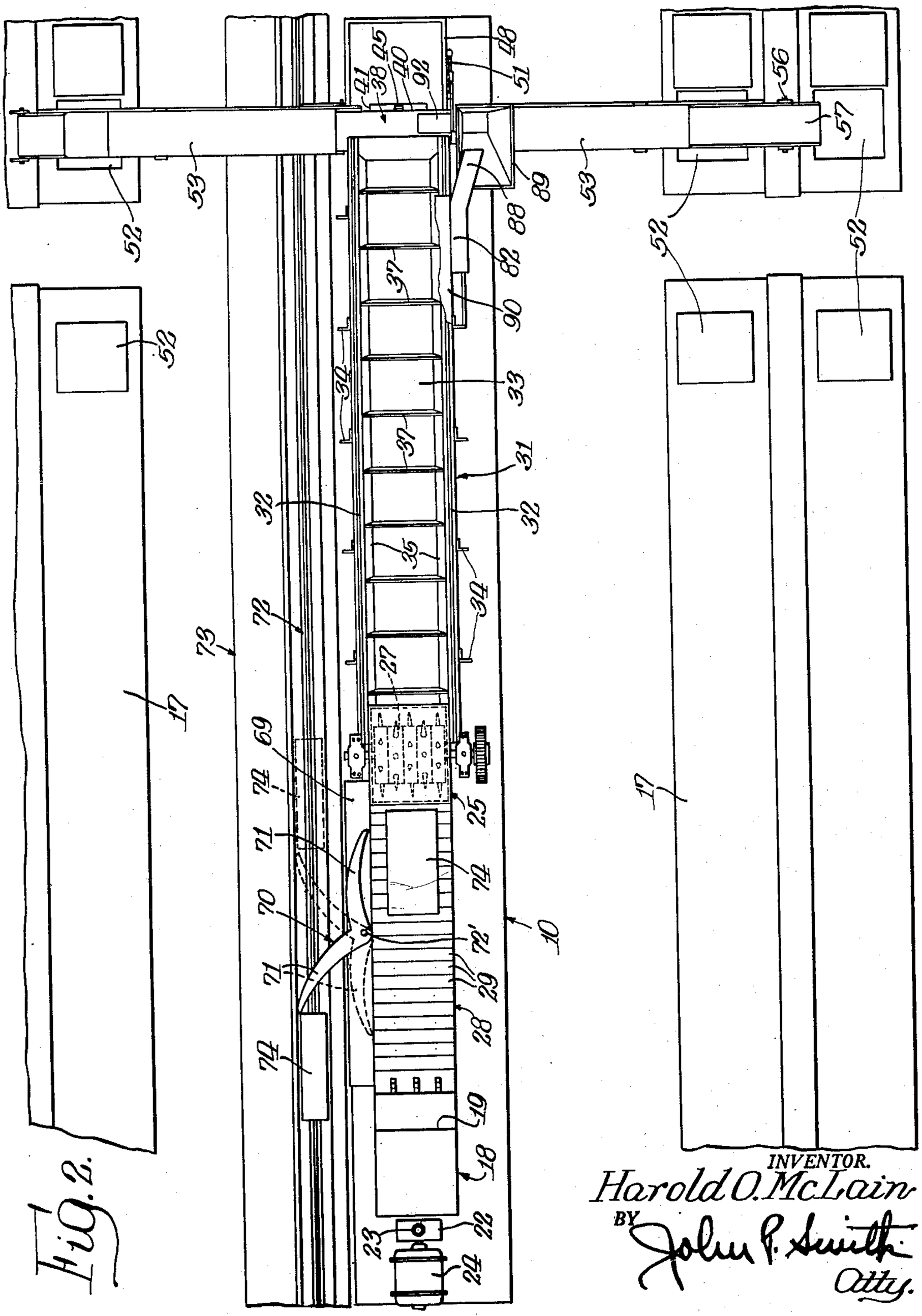

Fig. 2.

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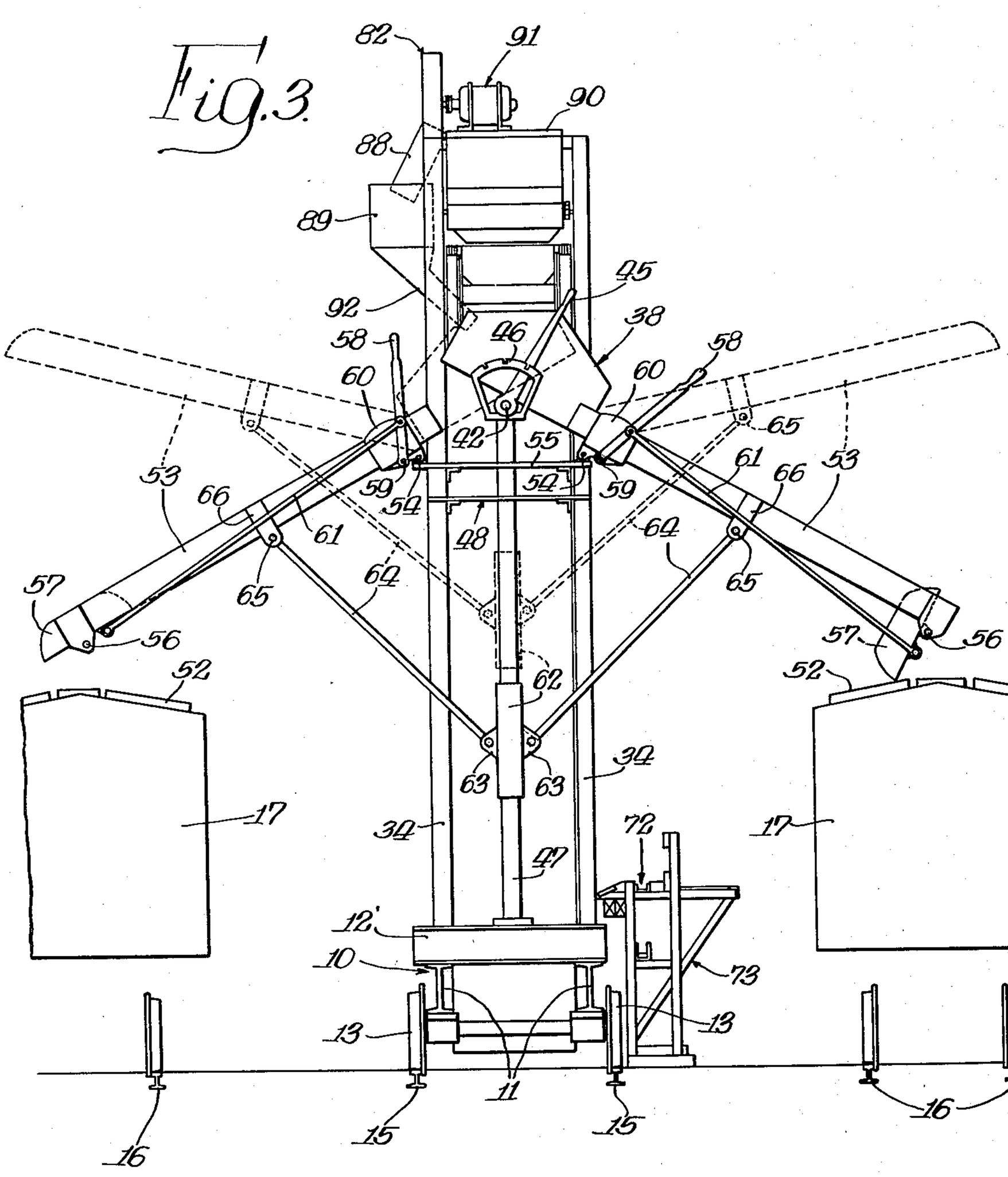
Fig. 3.



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Patented Feb. 17, 1953 2,628,477

UNITED STATES PATENT OFFICE

2,628,477

MASTER CAR ICING MACHINE

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Application July 12, 1950, Serial No. 173,290

4 Claims. (Cl. 62—1)

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The present invention relates generally to the servicing or icing of refrigerator cars, but more particularly to a mobile master car icing unit which will perform the complete icing service with a minimum amount of labor and within a minimum length of time.

One of the primary objects of the present invention is to provide a novel and improved master car icing unit which embodies all the necessary apparatus for complete ice servicing of refrigerator cars in the form of a simplified and compact mobile machine.

A further object of the invention is to provide a novel and improved master car icing machine in which an ice breaker and crusher mechanism, an ice crusher and slinging mechanism and a salt supply mechanism are carried by wheeled mobile frame in a compact arrangement of the operating elements thereof.

A still further object of the invention is to provide a self-propelled ice servicing machine for furnishing complete icing service of refrigerator cars or the like in which all the operating elements, including the ice block conveyor, are controlled by the operator from the operator's station on the mobile machine.

A still further object of the invention is to provide a novel and improved mobile refrigerator car icing machine in which the ice breaker and crusher mechanism, the ice crusher and slinger mechanisms and the salt supply and distributing mechanism are all coordinated and synchronously operated and assembled on a singled wheeled frame under the control of one operator on the machine.

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 side elevational skeleton view of my improved ice servicing machine with certain parts omitted for the purpose of clearness;

Fig. 2 is a top plan view of the same; and

Fig. 3 is an end elevational view of the same.

In illustrating one form of my improved mobile car icing machine may assume in practice, I have shown the same as comprising a relatively long longitudinally extending main frame, generally indicated by the reference character 10. This frame consists of two longitudinally extending and laterally spaced apart main side frame members or I-beams 11 and spaced apart transverse channel and I-beams 12 and 12′ respectively.

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The main frame 10 is suitably supported on front, rear and intermediate wheeled trucks, generally indicated by the reference character 13. The intermediate truck wheels 13 are suitably and operatively geared to and driven by an electric motor 14 secured to and carried by the main frame 10. The wheeled trucks 13 are adapted to travel on the conventional spaced apart railway tracks 15 which, in turn, are suitably imbedded in the ground between the conventional spaced apart railway tracks 16 on which are mounted the conventional railway refrigerator cars 17 to be iced or serviced by my master car icing machine. Mounted adjacent one end of the main frame 10 of the mobile unit is a conventional ice crusher and slinger, generally indicated by the reference character 18. This ice crusher and slinger unit 18 comprises briefly a housing 19 in which is mounted a rotary ice crushing cylinder 20, an endless conveyor 21 positioned horizontally within the housing 19 which conveys the ice blocks toward the crushing cylinder 20. Connected to the housing 19 is a rotary slinger, generally indicated by the reference character 22 which discharges the crushed ice through a tangentially connected conduit 23. An electric motor, generally indicated by the reference character 24, is mounted on the main frame 10 and is operatively connected to the rotor for driving the same within the slinger housing 22. A separate motor (not shown) is mounted on the housing 19 for driving the crushing cylinder 20. Mounted on an intermediate portion of the main frame 10 is a conventional type of ice breaking and crushing mechanism, generally indicated by the reference character 25. The ice breaking and crushing mechanism includes a housing 26 in which is suitably journaled an ice crushing pronged cylinder 27. A suitable electric motor (not shown) may be mounted on the housing 26 to operatively drive the cylinder 27. Extending from a point adjacent the receiving end of the horizontal conveyor 21 to a point substantially below the center of the ice crushing cylinder 27 is a horizontally extending endless ice block conveyor, generally indicated by the reference character 28. The endless conveyor 28 in this instance comprises a series of steel slats 29 suitably connected to spaced apart chains which, in turn, are trained about the spaced apart rollers or sprocket wheels 30. Extending from a point vertically below the ice breaker and crusher mechanism 25 and below the delivery end of the ice block conveyor 28, is an upwardly and rearwardly inclined crushed ice elevating and conveying mechanism, generally indicated by the ref-

erence character 31. This crushed ice elevator frame 31 is located between the two longitudinally extending I-beams 11 of the main frame 10 and extends substantially at an angle of forty-five degrees with respect to the horizontal main frame. The elevator frame 31 comprises a trough-like structure which includes oppositely disposed spaced apart sides 32 and a bottom 33. The elevator 31 is supported in position by oppositely disposed and spaced apart angle members 34 which have their lower ends secured to the opposite ends of the transverse channels 12 and their upper portions secured to the side frames 32 of the elevator frame 31. The conveyor and elevator 31 includes a pair of endless chains 35 which have their opposite ends trained about horizontally spaced apart upper and lower pairs of sprocket wheels 36. Secured to the opposite chains 35 at uniformly spaced apart intervals, are transverse plates or crushed ice conveying paddles 37. The upper delivery end of the elevator and conveyor 31 delivers the crushed ice into a trough or scoop-like gate, generally indicated by the reference character 38. This gate 38 has a semi-cylindrical bottom 39 and a rear vertical transverse wall 40. The gate 38 is pivotally supported on a bracket 41 through the medium of a longitudinally extending shaft 42 which, in turn, is journaled in the opposite bearing portion 43 of the bracket 41. The gate 38 is pinned to the shaft 42 by a pin 44. Secured to the rear end of the shaft 42 is a hand lever 45 which is adapted to be moved in to any one of three positions of adjustment through the medium of a sector 46 and locked in position by a conventional detent mechanism associated with the handle. Obviously by manipulating the handle 45, the gate 38 may be tilted to either the full line position or the dotted line position shown in Fig. 3 of the drawings for the purpose of discharging the crushed ice to the chutes on either side of the mobile unit for servicing the cars in the manner hereinafter described. The gate 38 and its associated bracket 41 are supported on the top end of the vertical standard 47 which has its lower end secured to one of the I-beams 12' carried by the main frame 10. Positioned below the operating handle 45 is an operator's platform or station, generally indicated by the reference character 48 which has its inner end secured to the two rear vertical angle members 34 and braced by diagonal braces 49. The usual guard rails, generally indicated by the reference character 50, surround the platform and entrance to and exit from the platform is secured by the usual ladder 51 extending from the main frame 10 of the machine.

The crushed ice is discharged from the mobile unit to the open hatches 52 on the opposite sides of and opposite ends of the refrigerator cars 17 by oppositely disposed chutes 53. These chutes 53 are pivoted, as shown at 54, to a transverse bracket 55 which, in turn, has its opposite ends secured to the vertical opposite angle members 34. Pivoted, as shown at 56, are supplement or extension chutes 57 which permit the discharge of ice to the near side or far side opened hatches on either side of the car. These extension chutes are actuated from the operator's platform 48 by oppositely disposed levers 58 which are pivoted at 59 to hinged brackets 60 of each of the chutes 53. An intermediate portion of each of these levers 58 are connected by a rod 61. Both chutes 53 may be raised or lowered from the full line position to the dotted line position through the medium of a sliding bracket 62 which embraces

and is slidably mounted on the vertical standard 47. The bracket 62 is provided with apertured ears 63 in which the lower ends of two oppositely disposed rods 64 are pivoted. The upper ends of these rods 64 are pivotally connected, as shown at 65, to brackets 66 secured to the opposite chutes 53. Connected as shown at 64', to the bracket 62 is a cable 65' which is trained about a pulley 66'. The pulley 66', in turn, is journaled in the bracket 67 which, in turn, is secured adjacent the upper end of the standard 47. The other end of the cable is connected to an electrically driven windlass, generally indicated by the reference character 68. Suitable electrical controls (not shown) extend to the operator's platform for controlling this electrically operated windlass. Positioned on one side of the main frame 10 and substantially at the level of the top lap of the conveyor 28 is an inclined chute 69 over which the ice blocks are deflected by a deflector, generally indicated by the reference character 70. The deflector 70 is provided with two diverging curved arms 71 and is pivoted, as shown at 72', to the main frame 10 so that the ice blocks may be deflected from an associated longitudinally extending conveyor to the mobile unit on the machine.

In a manner similar to that disclosed in my co-pending joint application, Serial No. 778,004, filed October 4, 1947, now Patent No. 2,544,431, a longitudinally extending ice block conveyor, generally indicated by the reference character 72, is positioned adjacent the mobile unit for conveying the ice blocks in a path longitudinally of and one side of the travel of the mobile unit so that they can be deflected from this conveyor on to the mobile machine. This conveyor 72 furnishes the ice blocks from a supply source to the unit and can be actuated in either direction of travel. This endless ice block conveyor 72 is supported in an elevated position slightly above that of the horizontal conveyor 28 and is supported in this position by a longitudinally extending structural support, generally indicated by the reference character 73, the details of which are more specifically disclosed and described in my aforementioned co-pending application and for a more detailed description, reference to this application may be had. In Fig. 2 of the drawings, the ice blocks on the conveyor 72 and on the conveyor 28 are generally indicated by the reference character 74 to illustrate the manner in which these ice blocks are conveyed and deflected on the various conveyors.

One of the essential features of the present invention is the positioning of a salt bin under the inclined crushed ice elevator so as to conserve space and make a more compact unit for supplying the necessary amount of salt to the crushed ice being discharged laterally from the mobile unit to the ice chutes into the various hoppers of the refrigerator cars. This salt supply and distributing mechanism includes a salt bin, generally indicated by the reference character 75, which is mounted on the main frame 10 of the mobile unit and in a position below the inclined elevator and conveyor 31 as clearly disclosed in Fig. 1 of the drawings. This salt bin 75 includes an inclined top 76, end walls 77 and opposite parallel side walls 78 and is located between the vertical angle supports 34 positioned on the opposite sides of the machine. The salt bin 75 is provided with an inclined bottom as shown at 79, so as to discharge the salt laterally

by gravity through an opening 80 into a conduit 81 from where it is discharged into the lower end of a salt elevating housing, generally indicated by the reference character 82. This elevating housing 82 is substantially rectangular in cross section and has mounted therein an endless elevating chain 83. The elevating chain 83 is trained about upper and lower sprocket wheels 84 and 85 respectively. Secured to the chain 83 at uniform intervals throughout the length thereof and in a manner well understood in the art, are salt carrying buckets 86. As these buckets are moved passed the lower end of the elevating housing 82, the salt is discharged through the opening 87 in the lower end of the housing from the conduit 81 and elevated upwardly to the upper end of the housing and discharged through a spout 88 into a salt directing or funnel-like member 89. The elevator housing 82 is suitably supported on the outside of one of the I-beam members 11 of the main frame 10 at its lower end and is suitably secured to a longitudinal frame member 90 at its upper end. The frame member 90 is secured at the upper ends of the opposite pairs of vertical angle frame members 34. The salt elevator and conveyor 83 is driven by an electric motor and associated transmission mechanism, generally indicated by the reference character 91, which is mounted on the longitudinal extending frame member 90 adjacent the upper end of the elevator to operatively drive the sprocket wheel 84. Controls for this electric motor extend to the operator's station 48 so that a regulated amount of salt may be discharged into the scoop-like gate 38 as the ice is being discharged laterally into either of the chutes 53. The funnel-like member 89 has a converging bottom which, in turn, is connected to and communicates with an inwardly inclined conduit 92 for properly discharging the salt into the scoop-like gate 38 when it is tilted in either the full line or dotted line positions shown in Fig. 3 of the drawings.

Summarizing the advantages and functions of operation of my improved mobile icing machine for complete ice servicing of refrigerator cars, it will readily be seen that the operator on the station or platform 48 may manipulate the controls for actuating or propelling the machine in either direction on the tracks 15 and stop the machine at intervals for properly aligning the chutes 53 with the hatch openings 52 of the refrigerator car 17. Then by properly positioning the deflector or switch 70 so as to engage the ice blocks 74 on the longitudinal ice block conveyor 72, the ice blocks may be deflected on the conveyor 26. From here they can be conveyed into the ice breaker and crusher mechanism 25 where the crushed ice will be dropped downwardly onto the receiving end of the inclined elevator and conveyor 31. The crushed ice is then conveyed upwardly and discharged into the scoop-like gate 38 from where it is discharged in either one of the laterally inclined chutes 53 to the hoppers of the refrigerator cars on either side of the mobile machine.

In this connection it will also be noted that within the reach of the operator on the operator's platform 48, the control for the desired or measured amount of salt may be regulated. In this connection the salt is elevated and conveyed from the bin 75 through the conduit 81 into the opening 87 of the elevating housing 82 and elevated upwardly by the buckets 86 into the funnel-like member 89 from where it is discharged through the conduit 92 into the scoop-like gate 38 to be discharged with the crushed ice into the hoppers of the refrigerator cars. The ice chutes 53 on the opposite sides of the mobile unit may be raised or lowered through the medium of the cable 65' and electrically driven windlass 68 in the manner hereinbefore described. The adjustment of these chutes, of course, is controlled from the operator's position on the station 48. Similarly, the oppositely disposed levers 58 may be operated from the operator's station 48 for properly positioning the chute extensions 57 to discharge the crushed ice into the near or far side openings or hoppers of the refrigerator cars.

Should the operator desire to top-ice perishable material in the refrigerator cars through the opened doors, the conveyor 28 may be operated in the reverse direction and controlled from the operator's station 48 for feeding the ice blocks into the ice crusher and slinging mechanism 18 from where it may be discharged through the conduit 23 to the opened doors of the refrigerator cars.

In this connection it will also be observed that the direction of travel as well as the start and stop of the ice block conveyor 72 may be controlled from the operator's station 48 so that obviously the operation of all the various units are under control of the operator on the station 48 of the mobile unit.

From the above description it will be seen that I have provided a very simple, compact and an efficiently operated mobile ice servicing machine for servicing refrigerator cars and one in which the operating elements thereof are in the control and under the observation of one operator on the operator's platform. This unitary control not only simplifies and increases the efficiency of the ice servicing operation, but also dispenses with the number of men heretofore required to perform these various operations and reduces to a minimum the loss of time employed for this function.

While in the above specification I have described one embodiment which my invention may assume in practice, it will, of course, be understood that the same is capable of modification and that modification 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 horizontal frame, wheeled trucks for supporting said frame, a horizontal ice block conveying mechanism mounted on said frame, an ice breaking and crushing mechanism mounted on said frame and located at one end of said ice block conveying mechanism, a crushed ice elevating and conveying mechanism mounted at an angle with respect to said horizontal frame for receiving the crushed ice from the ice breaking and crushing mechanism and elevating the same to an elevation above the tops of the refrigerator cars, laterally projecting ice chutes mounted on the opposite sides of said frame for receiving the crushed ice from the delivery end of said elevating and conveying mechanism and discharging the same to the hoppers of the refrigerator cars, and means mounted on said frame and operatively connected to said chutes for simultaneously raising and lowering said chutes.

2. A refrigerator car icing machine comprising a horizontal frame, wheeled trucks for supporting said frame, a horizontal ice block conveying mechanism mounted on said frame, an ice breaking and crushing mechanism mounted on said frame and located at one end of said ice block conveying mechanism, a crushed ice elevating and conveying mechanism mounted at an angle with respect to said horizontal frame for receiving the crushed ice from the ice breaking and crushing mechanism and elevating the same to an elevation above the tops of the refrigerator cars, laterally projecting ice chutes mounted on the opposite sides of said frame for receiving the crushed ice from the delivery end of said elevating and conveying mechanism and discharging the same to the hoppers of the refrigerator cars, a trough gate pivoted on said frame between said chutes for directing the crushed ice into either of said chutes, and a vertically movable member mounted on said frame and operatively connected to said laterally projecting chutes for simultaneously raising and lowering said chutes.

3. A refrigerator car icing machine comprising a horizontal frame, wheeled trucks for supporting said frame, a horizontal ice block conveying mechanism mounted on said frame, an ice breaking and crushing mechanism mounted on said frame and located at one end of said ice block conveying mechanism, a crushed ice elevating and conveying mechanism mounted at an angle with respect to said horizontal frame for receiving the crushed ice from the ice breaking and crushing mechanism and elevating the same to an elevation above the tops of the refrigerator cars, laterally projecting ice chutes mounted on the opposite sides of said frame for receiving the crushed ice from the delivery end of said elevating and conveying mechanism and discharging the same to the hoppers of the refrigerator cars, a salt bin mounted on said frame under said crushed ice elevating and conveying mechanism, a salt elevating mechanism mounted on said frame for elevating the salt from the bin to an elevation above the tops of the refrigerator cars, a trough gate pivoted on said frame between said chutes for directing the crushed ice into either of said chutes, means mounted on said frame for directing the salt from the delivery end of the salt elevator into said trough gate, and power actuated means mounted on said frame and operatively connected to both of said chutes for simultaneously raising and lowering said chutes.

4. A refrigerator car icing machine comprising a horizontal frame, wheeled trucks for supporting said frame, a horizontal ice block conveying mechanism mounted on said frame, an ice breaking and crushing mechanism mounted on said frame and located at one end of said ice block conveying mechanism, a crushed ice elevating and conveying mechanism mounted at an angle with respect to said horizontal frame for receiving the crushed ice from the ice breaking and crushing mechanism and elevating the same to an elevation above the tops of the refrigerator cars, laterally projecting ice chutes mounted on the opposite sides of said frame for receiving the crushed ice from the delivery end of said elevating and conveying mechanism and discharging the same to the hoppers of the refrigerator cars, a salt bin mounted on said frame under said crushed ice elevating and conveying mechanism, a salt elevating mechanism mounted on said frame for elevating the salt from the bin to an elevation above the tops of the refrigerator cars, a trough gate pivoted on said frame between said chutes for directing the crushed ice into either of said chutes, means mounted on said frame for directing the salt from the delivery end of the salt elevator into said trough gate, an operator's station mounted on said frame at an elevation above the tops of the refrigerator cars, power actuated means mounted on said frame and operatively connected to both of said chutes for simultaneously raising and lowering said chutes, and control means within easy reach of the operator on the operator's station for controlling the operation of said power means.

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