March 6, 1951 H. O. McLAIN ET AL 2,544,431

MASTER CAR ICING UNIT

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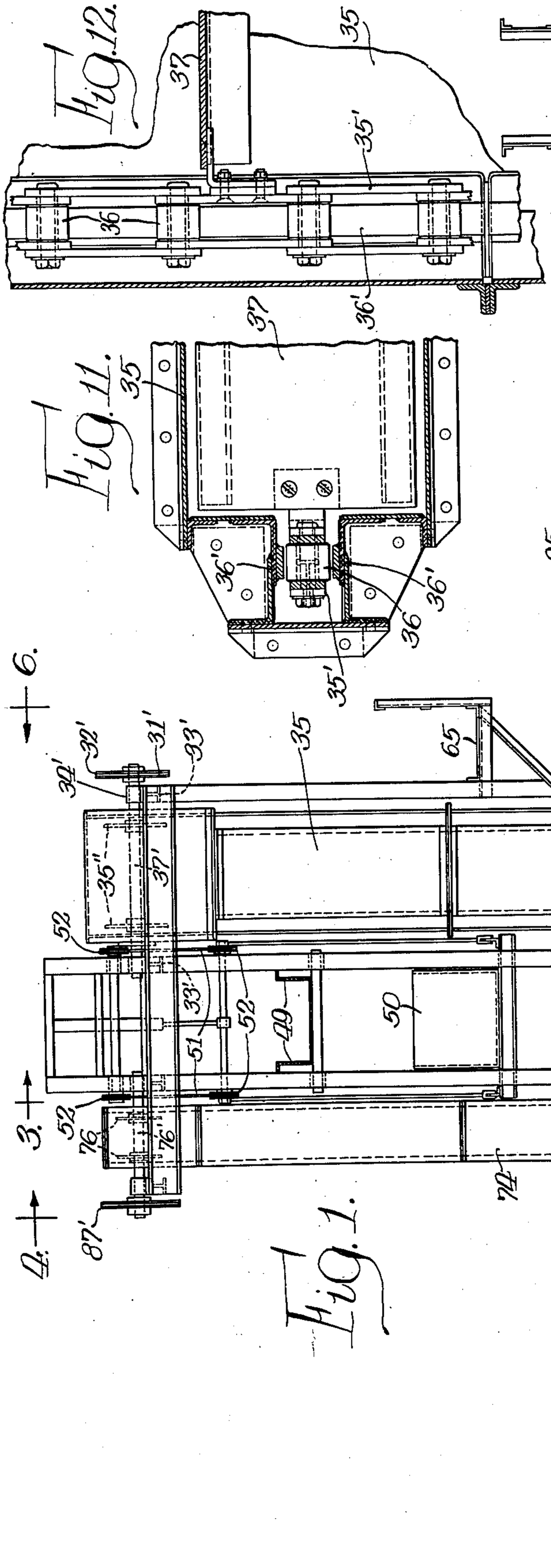


Fig. 12.




Fig. 11.




Fig. 1.

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8 Sheets-Sheet 2

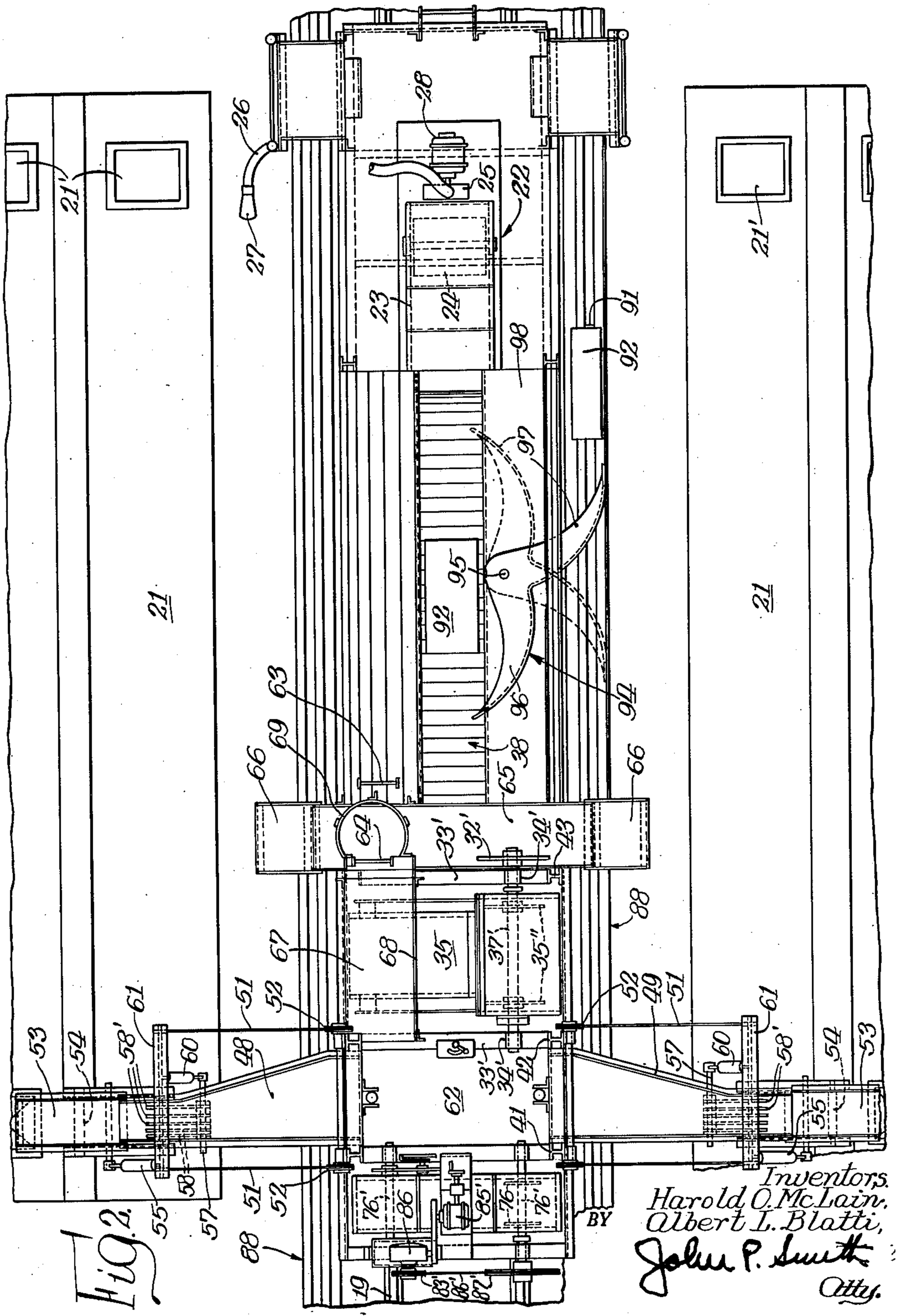


Fig. 2.

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8 Sheets-Sheet 3

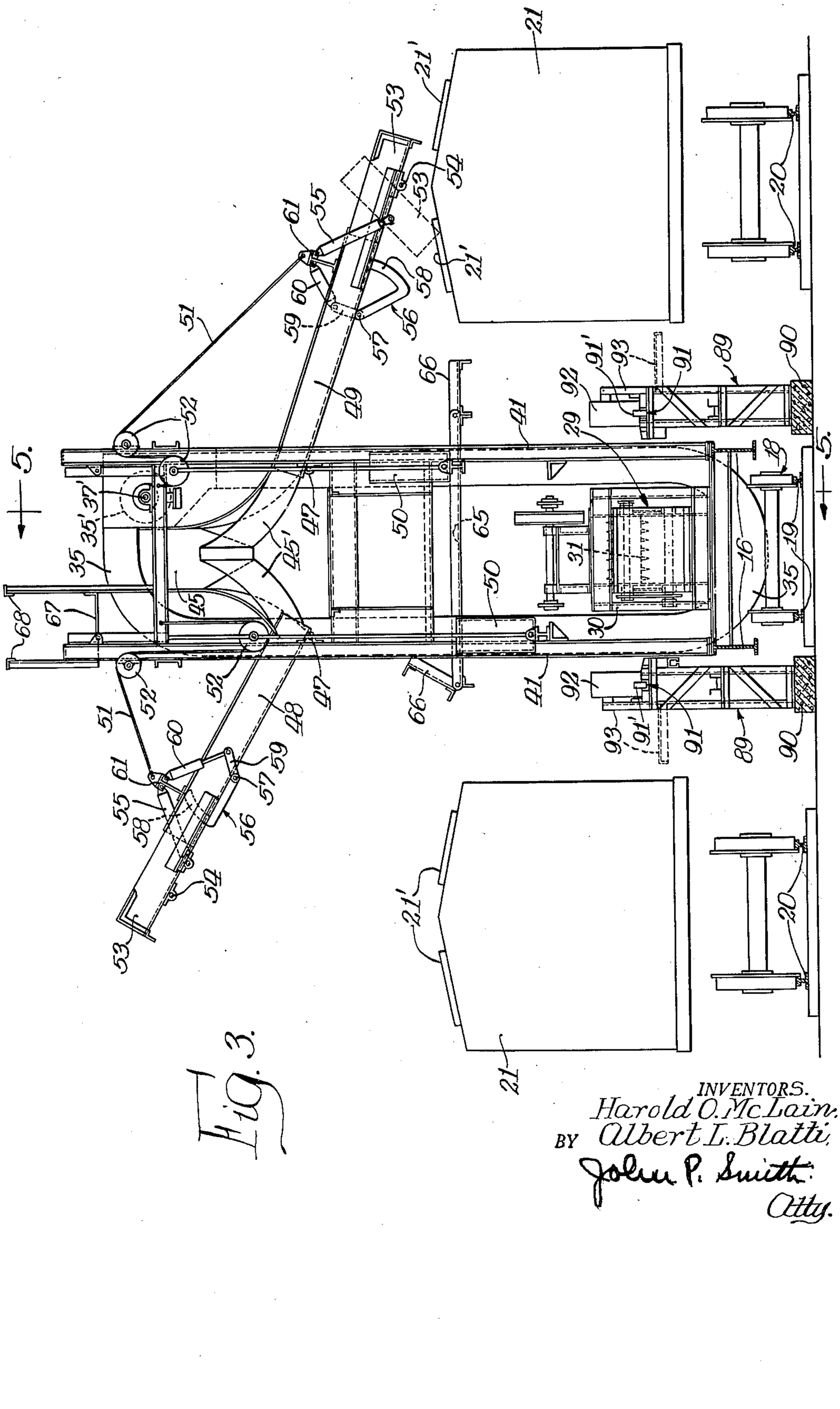


Fig. 3.

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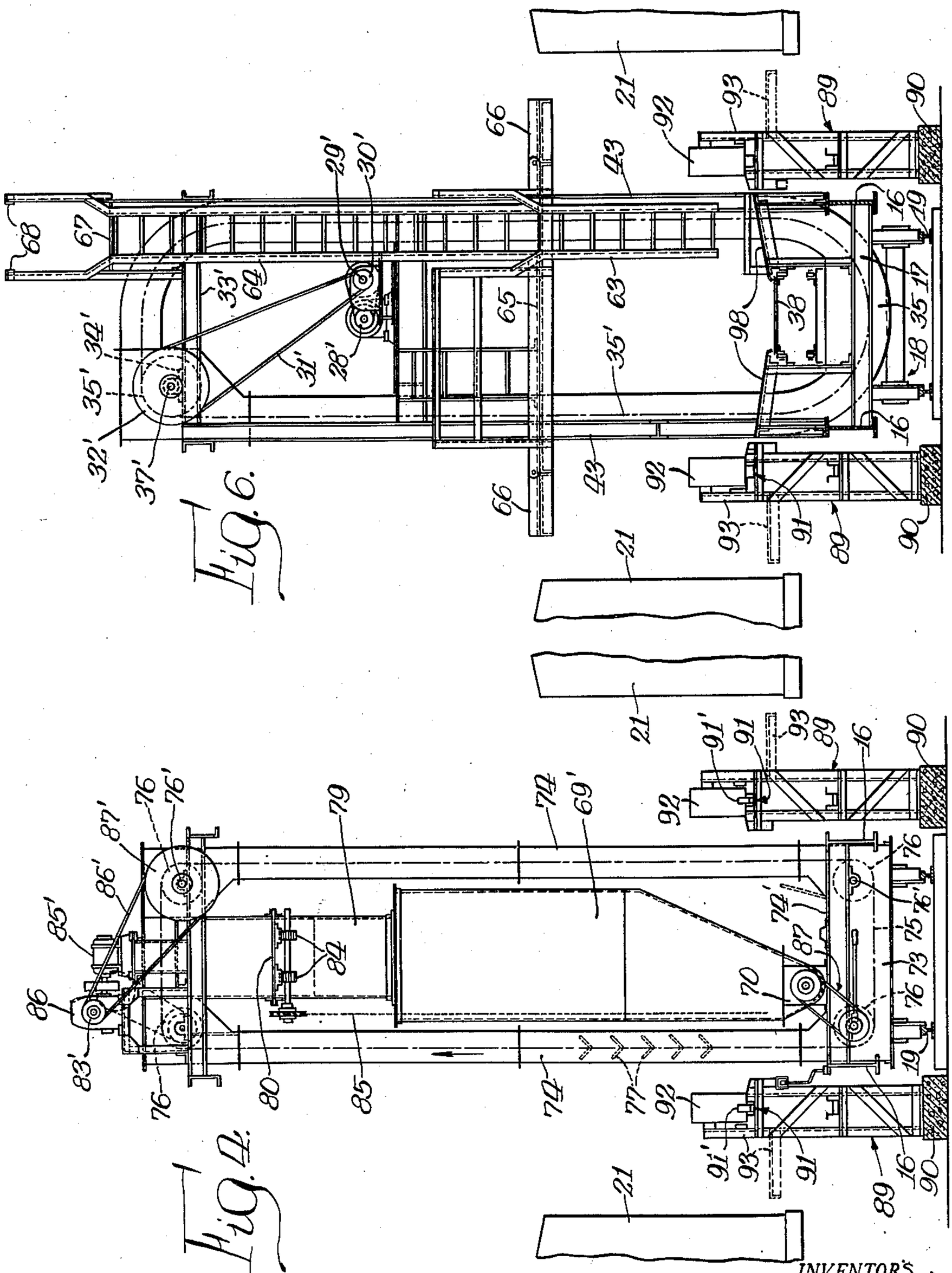


Fig. 6.




Fig. 4.

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MASTER CAR ICING UNIT

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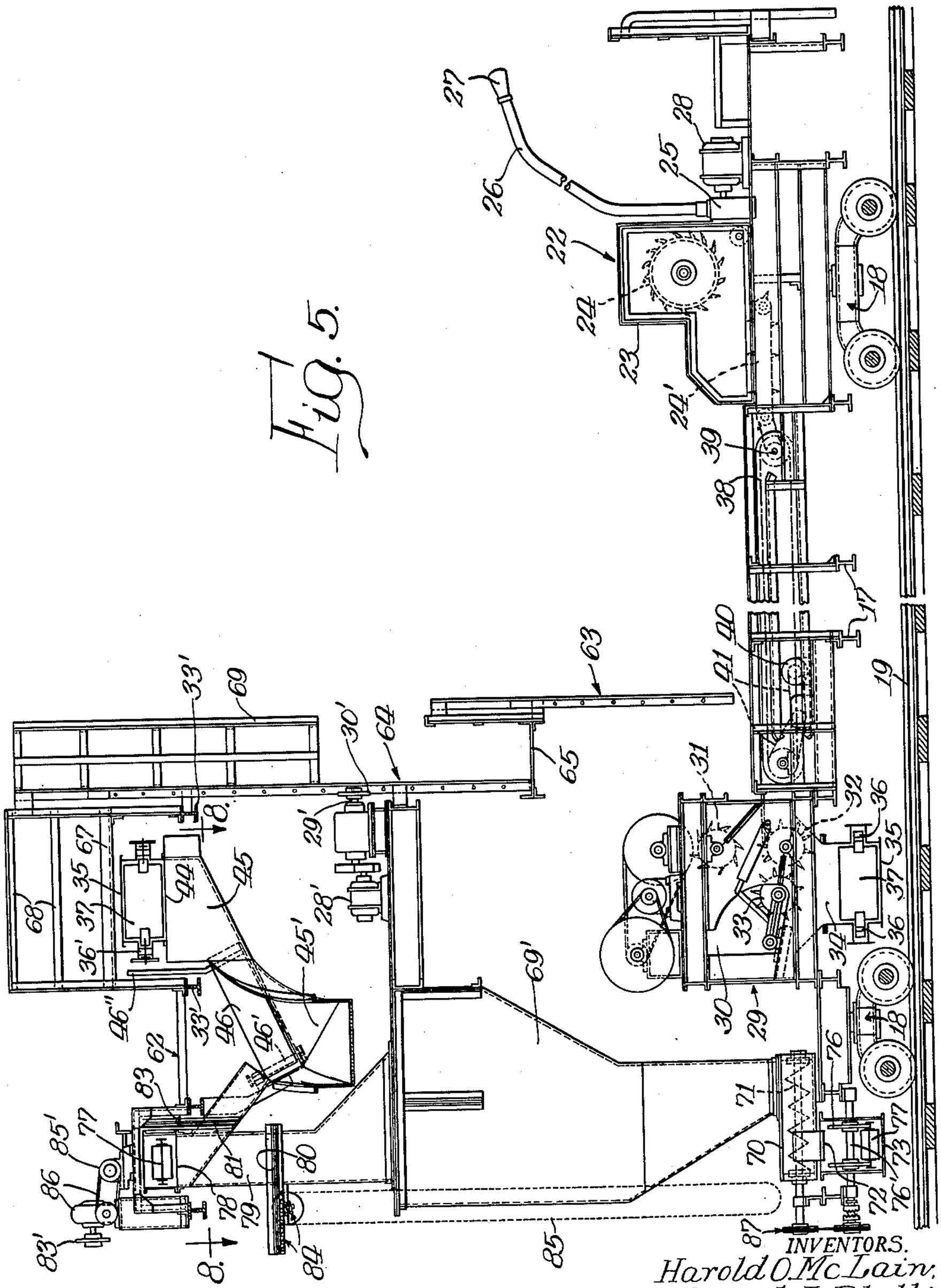
Fig. 5.

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MASTER CAR ICING UNIT

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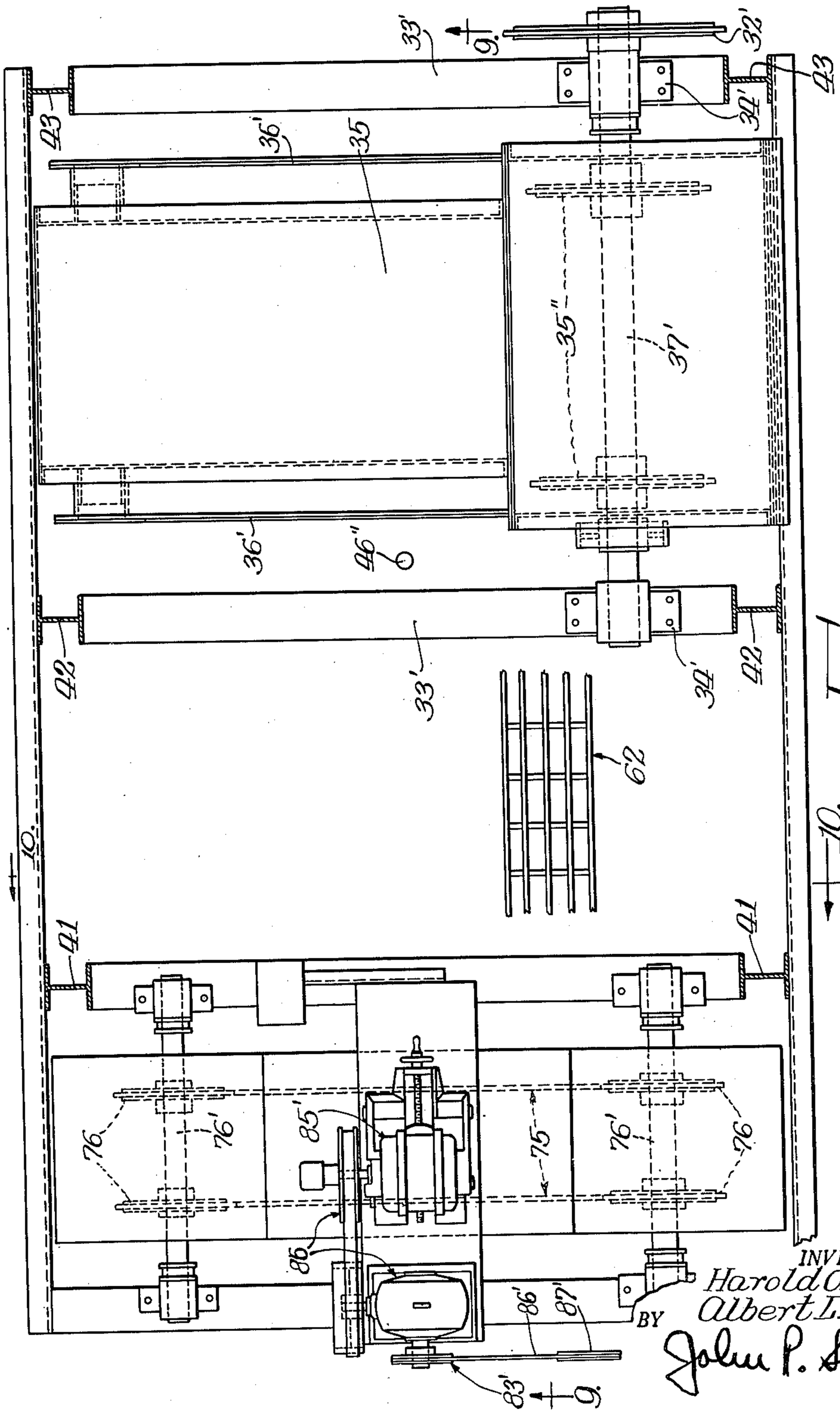


Fig. 7.

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MASTER CAR ICING UNIT

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Fig. 8.

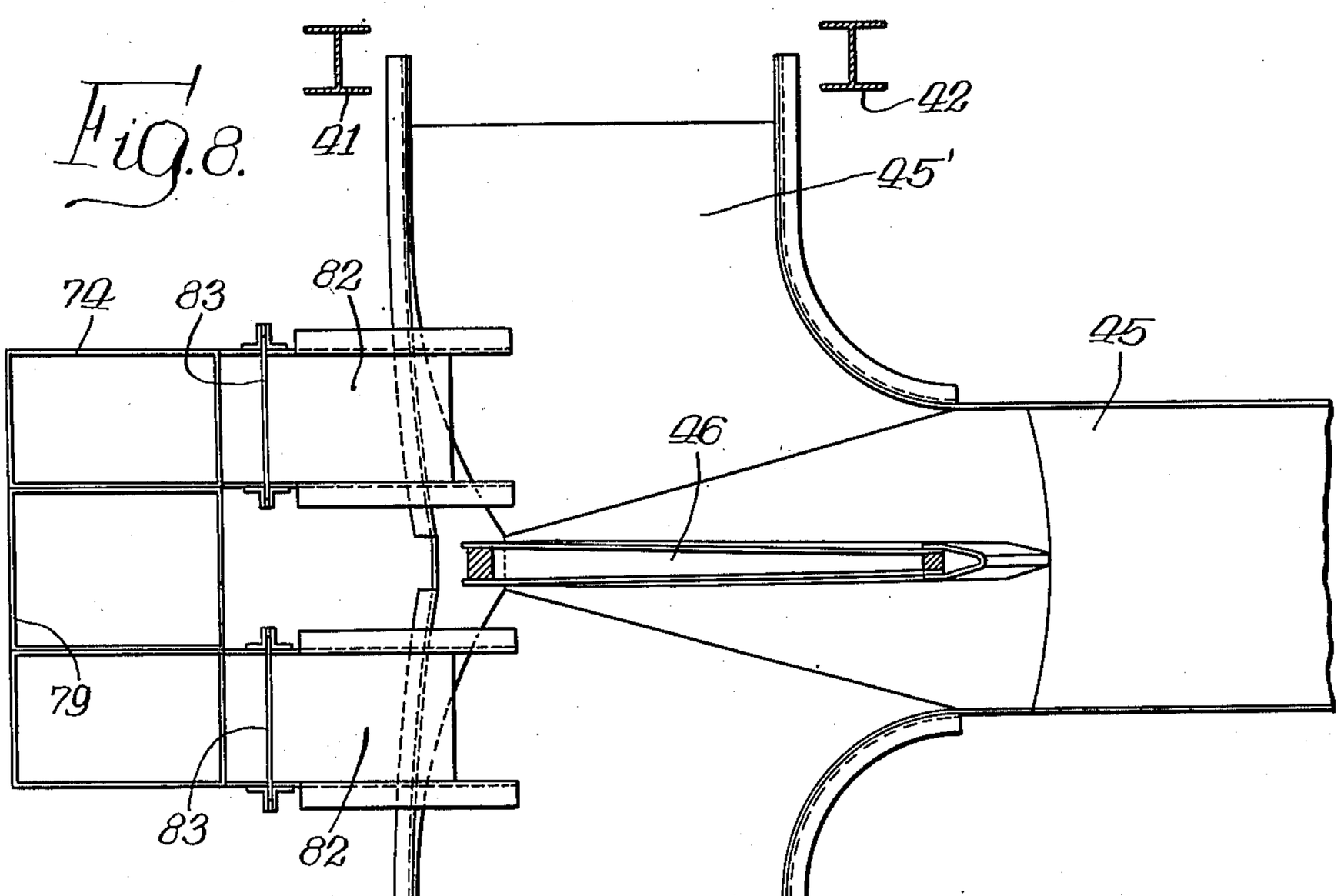
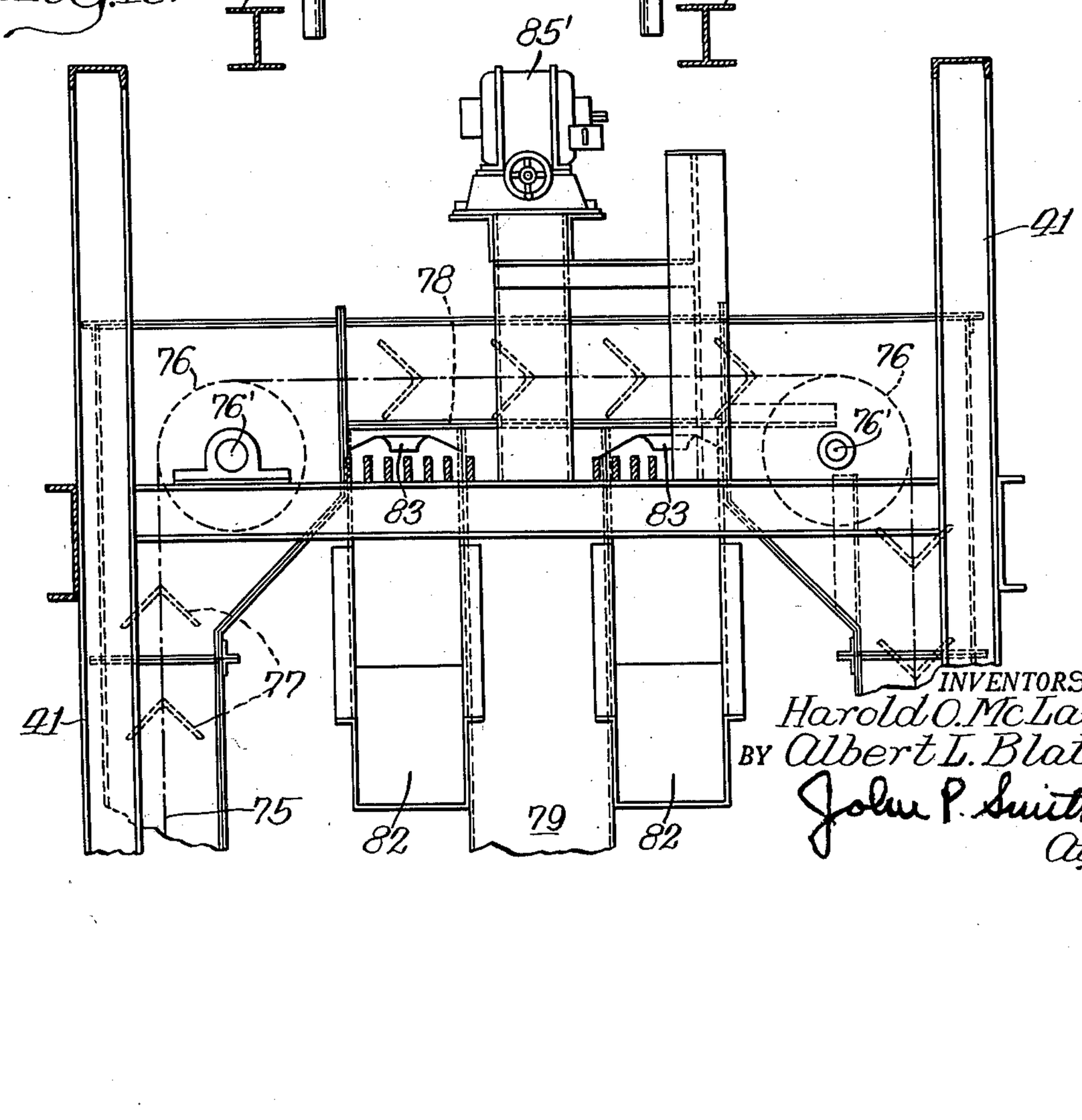



Fig. 10.

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MASTER CAR ICING UNIT

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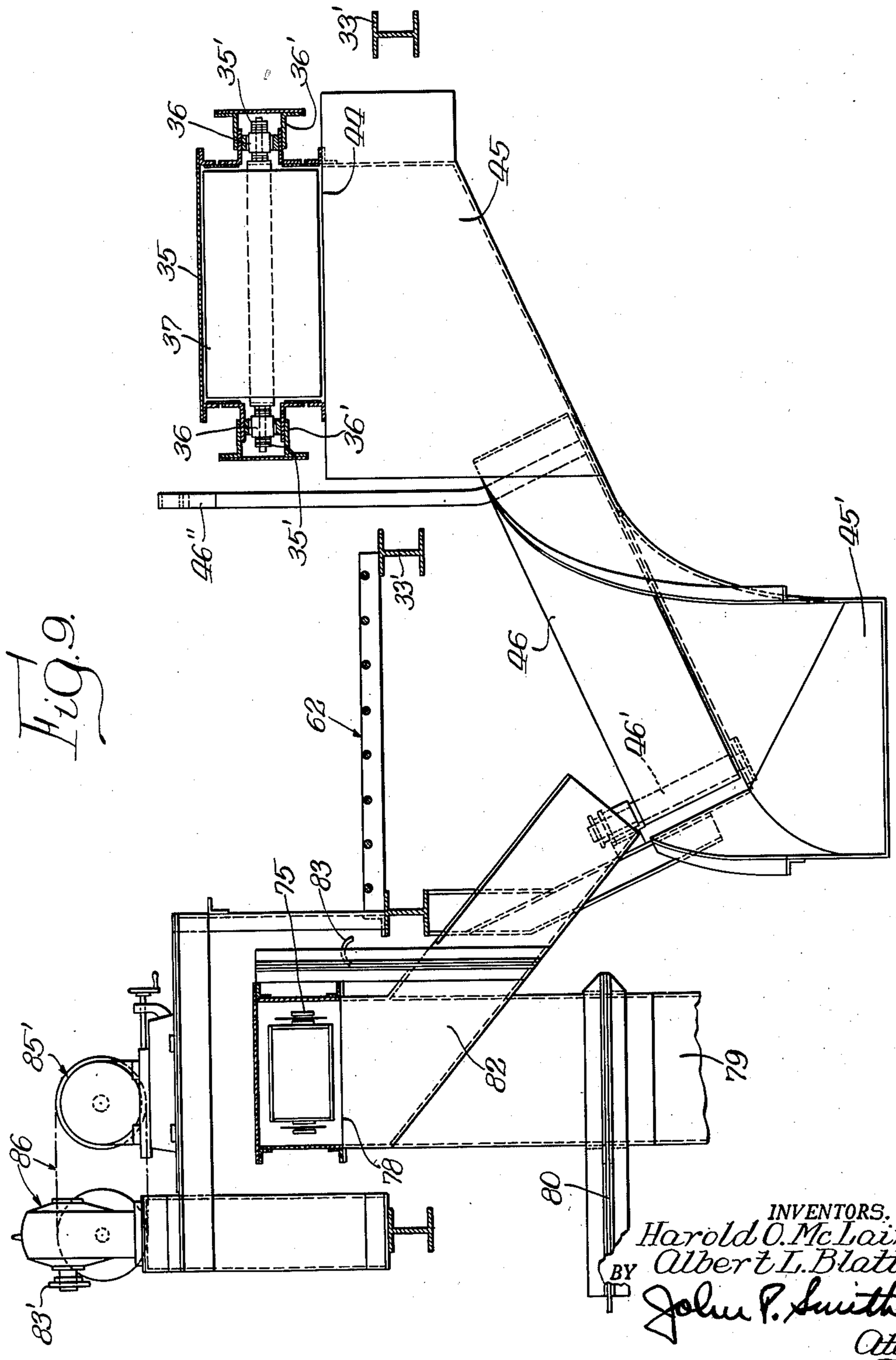


FIG. 9.

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Patented Mar. 6, 1951 2,544,431

# UNITED STATES PATENT OFFICE

2,544,431

## MASTER CAR ICING UNIT

Harold O. McLain, Highland Park, and Albert L. Blatti, Chicago, Ill.; Ruby Catherine Blatti, executrix of said Albert L. Blatti, deceased, assignor to said McLain

Application October 4, 1947, Serial No. 778,004

17 Claims. (Cl. 62—1)

1

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

Heretofore the complete servicing or icing of refrigerator railway cars required, in many instances, long, cumbersome elevated platforms or docks which usually extended in various lengths up to four thousand feet between two oppositely positioned lines of cars to be iced. In addition to this, large crews of men were required to perform various laborious tasks not only in breaking the ice into proper sizes for refrigeration of different types of perishable goods, but also in conveying and transporting this broken or crushed ice to the bunkers at the ends of the cars. At the same time it required this same crew of men or different crews, if they were available, to perform the function of top icing the centers of the cars with an ice slinger, while other of the men would transport, by means of carts or carriages, salt when required and properly distribute the same in the bunkers.

Various other systems, methods and equipment have been heretofore used, but in each instance, the inefficiency of such equipment, together with the large number of men required, not only increased the cost of the icing service, but also caused long and serious delay of the shipment of perishable goods because of the time required for icing the cars.

It other words, the cumbersome and inadequate equipment and extensive crews of men heretofore required to perform the complete icing service of cars has not only been expensive, but also burdensome and often caused excessive losses to the railroads. Delay in the movement of these refrigerator cars in transport caused by the present type of icing service described becomes an increasing menace to the shipment of perishable goods by rail in the face of other competing types of transportation which are now available and are more speedy.

It is, therefore, one of the primary objects of the present invention to not only overcome the objections hereinbefore pointed out, but to also provide a novel and improved master car icing unit which will perform all the essential functions of complete car icing with increased speed and capacity with a minimum loss of time and with a minimum number of men.

Further important objects of the present invention is to provide a portable or self-propelled

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master car icing unit which will have the following listed advantages over the methods and apparatus heretofore used:

(1) Reduce the time required for icing approximately fifty percent (50%).

(2) Reduce the labor cost approximately seventy-five percent (75%).

(3) Increase safety factor by approximately seventy-five percent (75%).

(4) Reduce over-all maintenance cost by approximately twenty percent (20%).

(5) Reduce ice and salt wastage by approximately sixty percent (60%).

(6) Eliminate practically all unskilled labor.

(7) Place the control of all the operating mechanisms under the control of one man stationed on the master unit.

A still further object of the invention is to provide a novel and improved master car icing unit in which the separate operating elements, such as the ice breaker and crusher unit, the ice crusher and slinger unit and the salt supply and distributing unit, are coordinated and synchronously operated and assembled on a single traveling frame or mobile carriage under the control of an operator stationed on the unit.

A further object of the invention is to provide a novel and improved master car icing unit in which the ice breaker and crusher mechanism is located at one end of the traveling unit and the ice crusher and slinger mechanism is located on the other end of the unit with a common conveyor located between the two mechanisms for conveying ice blocks to either mechanism.

A still further object of the invention is to provide an automotive master car icing unit for furnishing complete icing service of refrigerator cars in which all the operating elements or mechanisms are coordinated and synchronized so as to secure maximum speed of operation and capacity of output.

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 view of the frame structure of the master car icing unit with certain parts omitted;

Fig. 2 is a top plan view of the complete unit;

Fig. 3 is a cross sectional view taken on the lines 3—3 in Fig. 1;

Fig. 4 is an end elevational view taken on the lines 4—4 in Fig. 1;

Fig. 5 is a cross sectional view taken on the lines 5—5 in Fig. 3;

Fig. 6 is a cross sectional view taken on the lines 6—6 in Fig. 1;

Fig. 7 is an enlarged fragmentary top plan view of the ice and salt elevators;

Fig. 8 is an enlarged fragmentary cross-sectional view taken on the lines 8—8 in Fig. 5;

Fig. 9 is a fragmentary cross sectional view taken on the lines 9—9 in Fig. 7;

Fig. 10 is a fragmentary cross sectional view taken on the lines 10—10 in Fig. 7;

Fig. 11 is an enlarged fragmentary horizontal cross-sectional view of the ice elevator; and

Fig. 12 is an enlarged fragmentary vertical cross-sectional view of the same.

The invention herein disclosed is an improvement on our invention disclosed in our-pending application, Serial No. 766,313, filed August 5, 1947, for an Icing Machine.

In illustrating one form our improved master car icing unit may assume in practice, we have shown the same as comprising a relatively long longitudinally extending main frame, generally indicated by the reference character 15. This frame consists of two longitudinally extending laterally spaced-apart main frame members or I-beams 16 and relatively smaller transverse I-beams 17. This main frame 15 is supported on front and rear wheeled trucks, generally indicated by the reference character 18. The wheels of one of the trucks 18 are geared to and are operatively driven by an electric motor 18' carried by the main frame 15. The wheeled trucks 18 are adapted to travel on universally regular tread rail tracks 19 suitably embedded in the ground between the conventionally spaced apart railway tracks 20 on which are mounted the conventional railway refrigerator cars 21 to be iced or serviced by our master car icing unit. Mounted adjacent one end of the main frame 15 of the master unit is a conventional ice crusher and slinger, generally indicated by the reference character 22. (See Fig. 5.) This ice crusher and slinger 22 includes briefly, a housing 23 in which is mounted a rotary ice crusher cylinder 24. An endless conveyor 24' within the housing 23 conveys the ice blocks to the crusher 24. Communicating with the housing 22 is a rotary ice slinger, generally indicated by the reference character 25 which discharges the crushed ice through a tangentially connected conduit 26 and nozzle 27. Suitable electric motors for driving the crusher cylinder 24 and the slinger 25 are provided, but only one of which is indicated by the reference character 28. The nozzle 27 of the ice slinger 25 can, of course, be directed to either side of the master unit for top icing the refrigerator cars on either side thereof.

Mounted on and located adjacent the other end of the main frame 15 of the master unit is our improved ice breaker and crusher mechanism which embodies a novel construction and a novel arrangement of adjustments whereby the same is capable of breaking and crushing ice blocks in predetermined sizes from approximately forty pound chunks up to finely crushed ice at a maximum speed capacity. This novel ice breaker and crusher is generally indicated by the reference character 29 and is described and illustrated in detail in our co-pending application, Serial No. 768,966, filed August 16, 1947, now Patent No. 2,537,779 granted January 9, 1951. Briefly, this ice breaker and crusher 29 includes a housing 30 in which is journaled two oppositely



positioned and vertically spaced apart pronged ice breaking cylinders 31 and 32. Cooperating with these two pronged cylinders is a third bodily movable pronged cylinder 33. The adjustment of certain of these cylinders permits the blocks of ice to be broken or crushed into substantially any desired sizes necessary for icing different types of perishable goods in transit. The details of the specific construction and operation of the same may be had by reference to the aforementioned co-pending application. The chunks or crushed ice, as the case may be, from this breaker and crusher 29 are dropped into a hopper 34 and from there into the lower portion of a loop-like elevator housing 35 which extends around and substantially embraces the ice breaker and crusher mechanism 29. Mounted within the elevator housing 35 are oppositely disposed endless chains 35' having rollers 36 journaled thereon which are guided in suitable channels 36' in the opposite sides of the housing 35. Uniformly spaced apart lift plates 37 extend between the opposite chains for elevating the crushed or chunk ice to distributor chutes in the manner hereinafter described. The chains 35' are driven through the medium of suitably spaced apart sprocket wheels 35'' secured to a shaft 37'. (See Figs. 6 and 7.) The shaft 37' is journaled on opposite bearings 34' secured to the transverse frame members 33' which, in turn, are secured to vertical posts 42 and 43. Secured to the shaft 37' is a pulley 32' which in turn, is driven by a belt 31'. The belt 31' in turn, is driven by a second pulley 30' which is secured to a countershaft 29'. The countershaft 29' in turn is driven by an electric motor, generally indicated by the reference character 28'. (See Fig. 6.)

Positioned in the longitudinal center of the main frame 15 of the master car icing unit and serving as a common conveyor for conveying the ice blocks to either the ice breaker or crusher mechanism 29 or the ice crusher and slinger mechanism 22 is an endless conveyor 38. The conveyor 38 alternately serves to furnish ice blocks to either unit 29 or 22 by merely reversing the travel of the conveyor 38 so that when the operator desires to ice the bunkers through the hatches at the top and opposite ends of the refrigerator cars, the top lap of the conveyor travels or is actuated in the direction toward the unit 29 and when the operator desires to top ice the cars through the center doors of the cars, the conveyor 38 travels in the reverse direction, or toward the slinger unit 22. The conveyor 38 is geared to and driven from the shaft 39 which forms a common support for the conveyor 38. The conveyor 38 is driven by an electric motor 40 and suitable sprocket wheels and chains generally indicated by the reference character 41. (See Fig. 5.) Mounted on and secured to the main frame 15 of the master unit are oppositely positioned pairs of spaced apart vertical posts or I-beams 41, 42 and 43. These posts are located adjacent the forward end of the main frame 15 and support the elevator housing 35 and the opposite ice discharge chutes and salt bin and elevator hereinafter more fully described.

Positioned below an opening 44 in the upper portion of the elevator housing 35 is an ice receiving chute 45 which has two outwardly diverging extensions 45'. This chute 45 is adapted to receive the ice elevated by the elevator 37 and direct it to either side of the unit by a manually movable gate 46 which is pivoted to the chute 45 as shown at 46'. The gate 46 may be swung

from one side of the chute 45 to the other side by a lever 46''. (See Figs. 5 and 6.) Pivoted at the opposite sides of the frame as shown at 47 are laterally extending ice distributing chutes 48 and 49 which are adapted to receive the ice from the two-way chute 45 and deliver it into bunkers through hatches 21' located on top and adjacent the opposite ends of the refrigerator cars 21. These chutes 48 and 49 may be lowered to discharge the ice into the bunkers or may be raised to non-operative position as clearly shown in Fig. 3 of the drawings. These chutes are counterbalanced by suitable weights 50. The weights 50 are connected by cables 51 trained about sheaves 52 to intermediate portions of each of the chutes. The chutes may be raised or lowered by hydramatic cylinders (not shown) which can be operatively connected between the chutes and the frame structure of the master unit. The outer ends of each of the chutes 48 and 49 are provided with channel-like extensions or end chutes 53 which are pivoted at 54 so as to permit the ice to be discharged into the hatches on either side of the cars. These channel-like extensions 53 are actuated to either the full line or broken line positions as shown in Fig. 3 of the drawings by conventional hydraulic cylinders, generally indicated by the reference character 55. Each of the chutes 48 and 49 are provided with ice retaining gates, generally indicated by the reference character 56, which are pivoted as shown at 57. The gates 56 consist of a plurality of spaced apart prongs 58 which may be actuated to extend through openings 58' in the bottoms of each of the chutes 48 and 49 for retaining the ice in the chutes above the gates whenever it is found necessary. (See Figs. 2 and 3.) For example, when sufficient ice has been discharged into one hopper, the ice may be retained in the chute by the gate 56 so the chute may be moved to the next hopper to discharge the retained ice. These gates 56 are provided with crank arms 59 which in turn, are connected to conventional hydraulic cylinders, generally indicated by the reference characters 60 for actuating the gates. One end of each of the cylinders 55 and 60 are pivotally connected to arch brackets 61 secured to the top portion of each of the chutes 48 and 49. All of these hydraulic cylinders are provided with usual source of pressure and conduit connections (not shown) and are controlled from the operator's station or platform, generally indicated by the reference character 62. The station 62 is located on top of the unit above the two-way chute 45 from where the complete operation of the master unit can be observed. The operator's station may be reached through the medium of two sets of ladders, generally indicated by the reference characters 63 and 64. A transverse walk 65 is located at approximately the height of the top of the cars 21. Oppositely hinged extensions 66 afford proper car clearance when folded up as shown in Fig. 3 of the drawings. Between the ladders 64 and the station 62 is a raised longitudinally extending walk 67 with suitable guard rails 68. (See Figs. 2, 5 and 6.) The ladder 64 is also provided with a suitable circular guide or shield 69.

Associated with our improved ice breaker and crusher mechanism so as to secure a pre-determined amount of salt and distribute the same continuously with the flow of the ice in the ice chutes 48 and 49, we have provided a vertically extending salt bin 69' which is suitably supported forwardly of and outside the forward I-beams



41 of the main frame 15. The lower end of the bin 69' communicates with and is adapted to discharge salt into a conveyor screw housing 70 in which is rotatively mounted a conveyor screw 71. The lower forward end of the housing 70 is provided with an opening as shown at 72 through which the salt is discharged by gravity into the lower portion 73 and an elevator housing 74. (See Figs. 4 and 5.) The elevator housing 74 is substantially rectangular in shape and square in cross-section and has mounted therein an endless conveyor or belt, generally indicated by the reference character 75. This belt is trained about suitably spaced sprocket wheels 76 secured to shafts 76' located in the four corners of the rectangular housing 74. Two of the shafts 76' are shown in Fig. 7 of the drawings. The belt 75 is provided with a plurality of uniformly spaced apart V-shaped buckets 77 for elevating the salt and discharging the same through an opening 78, the upper portion of the elevator housing 74. (See Fig. 10.) This opening extends across both salt chutes 82 and across a salt extension housing 79. From here it is discharged into the first or top salt chute 82 as viewed in Fig. 8 and then into the rectangular portion 79 of the bin 69. When the housing extension 79 is filled, the salt may then be discharged into the lower salt chute 82 as viewed in Fig. 8 of the drawings. A manually controlled gate 80 is mounted and adapted to shut off communication of the rectangular housing extension 79 with the bin 69 so as to hold the salt above this gate. These salt chutes 82 discharge salt into diverging or outwardly extending ice chutes 45' to supply the desired amount of salt as the ice is being discharged into the ice chutes. Suitable manually adjustable gates 83 for each of the salt chutes 82 control each of the openings and therefore supplements the regulation of the amount of salt supplied. The principal adjustment for the regulation of the amount of salt is controlled by a variable speed drive hereinafter described. The gate 80 is opened or closed by rack bars and pinions generally indicated by the reference character 84. (See Figs. 4 and 5 of the drawings.) The pinions are revolved manually by a suitable chain 85 in the conventional manner. The elevator 75 also performs the function of filling the salt bin 69'. In order to perform this function, the gate 80 between the extension 79 and the bin 69' is opened and bags of salt are discharged through an opening 74' in the lower part of the elevator housing 74. (See Fig. 4.) The salt elevator 75 is driven by an electric motor generally indicated by the reference character 85' which is suitably geared to a variable speed transmission and reduction gearing mechanism, generally indicated by the reference character 86. The reduction gearing mechanism, in turn, is connected by means of a sprocket wheel 83' and chain 86' to a driven sprocket wheel 87' secured to one of the shafts 76'. (See Fig. 7.) The conveyor screw 71 at the lower end of the elevator is suitably geared to one of the driven shafts of the elevator by a belt and gearing mechanism generally indicated by the reference character 87. (See Fig. 5.)

From the above description it will be seen that by regulating the variable speed mechanism 86 and adjusting either one of the gates 83, the amount of salt may be varied and continuously furnished with the ice chutes as the ice is being discharged into the hoppers of the refrigerator cars.

The ice blocks of three hundred pounds or more are conveyed to our improved master car ice unit through the medium of relatively long main conveyors, generally indicated by the reference character 88. In the drawings we have shown two such longitudinal conveyors, but as a matter of fact, one is all that is necessary to serve one unit, but should the operator desire two separate master units, then the two conveyors shown would be required. These conveyors may be of any desired length and are preferably mounted on a plurality of uniformly spaced apart angle members or posts, generally indicated by the reference character 89 and have their lower ends suitably embedded and secured to a cement foundation 90 suitably embedded in the ground. (See Figs. 2, 4 and 6.) These conveyors comprise the conventional longitudinal'y extending endless belts or chains, generally indicated by the reference character 91 which, in turn, have uniformly spaced apart lugs 91' for engaging the blocks of ice, generally indicated by the reference character 92. Pivoted to the upper portion of the frame structure at a height substantially level with that of the floor of the refrigerator cars 21 are catwalks, general'y indicated by the reference character 93 which provide a support or station for the operator thereon when top icing the center of the refrigerator cars through the opened doors thereof. The servicing and top icing of the cars is one of the functions of the ice crusher and slinger unit 22 through the medium of the conduit 26 and the nozzle 27 for directing the flow of crushed ice for this purpose. When the catwalks 93 are folded up to their vertical or full length position, as shown in Fig. 3 of the drawings, they serve as guides for the ice blocks 92 as the same are being conveyed along by the endless conveyor 88. The ice blocks 92 are deflected from the main conveyor 88 by a two-way switch 94 which is pivoted as shown at 95 to the frame of the unit. This switch or deflector is provided with two oppositely curved arms 96 and 97 so that the same may be employed to deflect a block of ice onto the conveyor 38 regard'ess of the direction of travel of the conveyor 88. When the block of ice is deflected by the deflector, it is tripped over on its flat side and slides down one of the inclined slides 98 located on either side of the conveyor 38. These slides 98 are located on the opposite sides of the conveyor 38 and extend substantially the length of the conveyor 38.

While in the above description and in the drawings we have described and illustrated blocks of ice 92 mounted on the opposite conveyors 88, it will be understood that only one of these conveyors is emp'oyed with each master unit and a supply of ice will only be taken from one conveyor. If, however, a second master unit like the one herein described, is operated on the same tracks as the first one, then the same is supplied by the second conveyor. It will also be noted that the deflector 94 may be transferred and pivoted on either side of the unit so that the ice blocks may be deflected onto the endless conveyor 38 from the main conveyor on either side. It will be further noted that the deflector 94 may be actuated about its pivot to a neutral position so that the arms 96 and 97 do not project over the main conveyor 88 and when in this position the ice will not be deflected from the conveyor 88.

Summarizing the advantages and functions of operation of our improved refrigerator car icing device, it will be readily observed that by combining into a single master mobile unit the ice breaker and crusher, the ice crusher and slinger and the automatic salt supply, we have not only coordinated and synchronized the operations of these mechanisms, but have also increased the speed and output of the respective mechanisms and reduced to a minimum the time heretofore required to perform their respective functions.



In the operation of our improved master car icing unit, the operator on the station or platform 62 observes and controls the operation of all the operating mechanisms of the master unit. The master unit may be propelled on the tracks 19 between the refrigerator cars 21 and at proper positions or intervals the unit is stopped to either ice the bunkers through the openings 21' located at the ends of the car or to top ice the cars through the center opened doors by the ice slinger device 22.

When the bunkers at the ends of the cars are being filled, the ice blocks 92 are successively deflected and turned on their flat sides from the main conveyor 88 by one of the arms 96 or 97 onto the conveyor 38. The conveyor 38, in turn, conveys the ice blocks into the ice breaker and crusher 29, where the ice is broken into the desired predetermined sizes in the manner hereinbefore describd. The ice chunks or crushed ice is then elevated by the elevator 37 and discharged into the chute 45. By positioning the gate 46 on one side or the other, the ice is deflected to either one of the laterally extending chutes 48 or 49. From these chutes 48 or 49 the ice is discharged into the bunkers of the cars. In the event the perishable goods in transit requires salt, the same is automatically supplied in predetermined amounts by the salt elevator 75, which in turn, discharges into one or the other of the salt chutes 82 to the ice chutes 45' in the manner herebefore described.

In the event the bunkers at one end of the car become filled, the ice in the chutes 48 or 49 may be retained therein by closing the gates 56 by energizing the hydraulic cylinders 60. The ice retained in the chute may then be discharged when the master unit is moved to the next bunker. Should the operator desire to top ice the cars through the center opened doors, the conveyor 38 is operated in the reverse direction in order to convey the ice blocks 92 toward the ice crusher and slinger unit 22.

The advantages of having all the essential operating mechanisms for furnishing the complete icing service for a wide variety of perishable goods embodied in a single master unit not only reduces the time heretofore required to perform this service, but also reduces to a minimum the number of men heretofore required.

While in the above specification we have described one embodiment which our 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 we claim as our invention and desire to secure by Letters Patent is:

1. A master car icing unit for icing refrigerator cars comprising a longitudinally extending wheeled frame, an ice breaking and crushing mechanism mounted on said wheeled frame, conveying and elevating mechanism mounted on said frame for elevating the crushed ice from the ice breaking and crushing mechanism to an

elevation above the top of the refrigerator cars, delivery chutes carried by said frame for discharging the crushed ice from the upper end of the conveying and elevating mechanism to the bunkers of the refrigerator cars, a salt bin carried by said frame, a salt conveying and elevating mechanism mounted on said frame for elevating the salt to an elevation above the top of the refrigerator cars, salt delivery chutes carried by said frame for discharging the salt from the upper end of the salt conveying and elevating mechanism to the crushed ice chutes, a longitudinally extending ice block conveying mechanism positioned to one side of and paralleling the path travel of the wheeled frame for continuously supplying ice blocks to said unit, and means carried by the wheeled frame for deflecting and conveying the ice blocks from said ice block conveyor to said ice breaking and crushing mechanism.

2. A structure as specified by claim 2, in combination with an inclined chute carried by the wheeled frame for guiding and transporting the deflected ice blocks toward the ice breaking and crushing mechanism, and a conveyor mounted on the wheeled frame for feeding the ice blocks from the inclined chute to the ice breaking and crushing mechanism.

3. A structure as specified in claim 2, in combination with a variable speed transmission mounted on said wheeled frame and operatively connected to the salt conveying and elevating mechanism for varying the amount of salt discharged into the crushed ice chutes.

4. A structure as specified in claim 2, in combination with an operator's station carried by said wheeled frame positioned at a level above the tops of the refrigerator cars, a variable speed transmission mounted on said wheeled frame and operatively connected to the salt conveying and elevating mechanism for varying the amount of salt discharged into the crushed ice chutes, and control means for said variable speed transmission operable from said operator's platform.

5. A structure as specified in claim 2 in combination with an oppositely curved ice block deflector pivoted on the wheeled frame and movable into the path of ice blocks conveyed by the ice block conveyor for deflecting the ice blocks on to said wheeled frame.

6. A structure as specified in claim 2 in combination with the crushed ice conveying and elevating mechanism embracing the ice breaking and crushing mechanism and the salt conveying and elevating mechanism positioned adjacent to and extending in substantial parallelism with the crushed ice conveying and elevating mechanism.

7. A master car icing unit for icing refrigerator cars comprising a longitudinally extending wheeled frame, a high speed ice breaker and crusher mechanism mounted on said wheeled frame, elevating mechanism mounted on said wheeled frame for elevating the crushed ice from the ice breaker and crusher mechanism to an elevation above the tops of said refrigerator cars, oppositely disposed inclined chutes for discharging the crushed ice from the delivery end of said elevating mechanism in either direction laterally of the wheeled frame to the adjacent refrigerator cars, a longitudinally extending and continuously driven ice block conveying mechanism positioned parallel to and on one side of the path of travel of said wheeled frame, and an ice block deflector mounted on said wheeled frame and extending into the path of travel of the ice blocks on said ice block conveyor for guiding and directing a continuous and uninterrupted flow of ice blocks from said ice block conveyor to said ice breaker and crusher mechanism.



8. A structure as specified in claim 7 in combination with a longitudinally extending conveyor mounted on said wheeled frame for conveying the ice blocks directly into said ice breaker and crusher mechanism.

9. A master refrigerator car icing unit comprising a longitudinally extending main frame, a motor mounted on said frame for propelling said unit, an ice breaker and crusher mechanism mounted on said frame, an elevator housing mounted on said frame and extending around said ice breaker and crusher mechanism, there being an opening in said housing for receiving the ice from said ice breaker and crusher mechanism, an endless elevating means mounted in said housing, and a distributing chute communicating with the upper end of said elevating means for discharging the ice therefrom.

10. A master refrigerator car icing unit comprising a longitudinally extending main frame, a motor mounted on said frame for propelling said unit, an ice breaker and crusher mechainsm mounted on said frame, an elevator housing mounted on said frame and extending around said ice breaker and crusher mechainsm, there being an opening in said housing for receiving the ice from said ice breaker and crusher mechanism, an endless elevating means mounted in said housing, and oppositely disposed and laterally extending ice chutes carried by said frame and communicating with the upper end of said elevator housing for receiving ice from said housing and discharging it therefrom.

11. A master refrigerator car icing unit comprising a main frame, wheels for supporting said main frame, an ice breaker and crusher mechanism mounted adjacent one end of said main frame, a crushed ice elevator housing of loop-shaped construction embracing said mechanism and adapted to receive crushed ice therefrom, elevating means mounted on said housing, there being an opening adjacent the upper end of said housing, a distributing chute carried by said frame having its ice receiving end located below said opening, and a laterally projecting chute pivoted on said frame for receiving ice from said first named chute.

12. A master refrigerator car icing unit comprising a main frame, wheels for supporting said main frame, an ice breaker and crusher mechanism mounted adjacent one end of said main frame, a crushed ice elevator housing of loop-shaped construction embracing said mechanism and adapted to receive crushed ice therefrom, elevating means mounted on said housing, there being an opening adjacent the upper end of said housing, a distributing chute carried by said frame having its ice receiving end located below said opening, a laterally projecting chute pivoted on said frame for receiving ice from said first named chute, a horizontal conveyor mounted on and in the longitudinal center of said main frame for conveying ice blocks to said ice breaker and crusher mechanism, and a main longitudinally extending ice block conveyor located laterally of and parallel to said unit for conveying ice blocks to said first named conveyor.

13. A master refrigerator car icing unit comprising a main frame, wheels for supporting said main frame, an ice breaker and crusher mechanism mounted adjacent one end of said main

frame, a crushed ice elevator housing of loop-shaped construction embracing said mechanism and adapted to receive crushed ice therefrom, elevating means mounted on said housing, there being an opening adjacent the upper end of said housing, a distributing chute carried by said frame having its ice receiving end located below said opening, a laterally projecting chute pivoted on said frame for receiving ice from said first named chute, a horizontal conveyor mounted on and located in the longitudinal center of said main frame for conveying ice blocks to said ice breaker and crusher mechanism, a main longitudinally extending ice block conveyor positioned laterally of and separated from said unit, and an oppositely curved deflector pivoted on said main frame and adapted to be positioned in the path of the ice blocks conveyed by said main conveyor for deflecting said ice blocks on to said first named conveyor.

14. A master refrigerator car icing unit comprising a main frame, wheels for supporting said main frame, an ice breaker and crusher mechanism mounted adjacent one end of said main frame, a crushed ice elevator housing of loop-shaped construction embracing said mechanism and adapted to receive crushed ice therefrom, elevating means mounted on said housing, there being an opening adjacent the upper end of said housing, a distributing chute carried by said frame having its ice receiving end located below said opening, a laterally projecting chute pivoted on said frame for receiving ice from said first named chute, a horizontally positioned movable conveyor carried by said main frame for conveying ice blocks to said ice breaker and crusher mechanism, a main ice block conveyor extending parallel to the line of travel of said unit, and means carried by said main frame for deflecting the ice blocks from the main conveyor to said first named conveyor.

15. A master car icing unit for icing refrigerator cars comprising a wheeled frame, an ice breaking and crushing mechanism mounted on said wheeled frame, mechanism mounted on said frame for elevating the crushed ice from the ice breaking and crushing mechanism, delivery chutes carried by said frame for discharging the crushed ice from the elevating mechanism to the bunkers of the refrigerator cars, a salt bin carried by said frame, a salt conveying and elevating mechanism mounted on said frame for elevating the salt, salt delivery chutes carried by said frame for discharging the salt from the salt conveying and elevating mechanism to the crushed ice chutes, an ice block conveying mechanism for continuously supplying ice blocks to said unit, and means carried by said wheeled frame for deflecting the ice blocks from said ice block conveyor to said ice breaking and crushing mechanism.

16. A master car icing unit for icing refrigerator cars comprising a wheeled frame, an ice breaking and crushing mechanism mounted on said wheeled frame, mechanism mounted on said



frame for elevating the crushed ice from the ice breaking and crushing mechanism, delivery chutes carried by said frame for discharging the crushed ice from the elevating mechanism to the bunkers of the refrigerator cars, a salt bin carried by said frame, a salt conveying and elevating mechanism mounted on said frame for elevating the salt, salt delivery chutes carried by said frame for discharging the salt from the salt conveying and elevating mechanism to the crushed ice chutes, an ice block conveying mechanism for continuously supplying ice blocks to said unit, means carried by said wheeled frame for deflecting the ice blocks from said ice block conveyor to said ice breaking and crushing mechanism, and a variable speed transmission mounted on said wheeled frame and operatively connected to said salt conveying and elevating mechanism for varying the amount of salt discharged into the crushed ice chutes.

17. A master car icing unit for icing refrigerator cars comprising a wheeled frame, an ice breaking and crushing mechanism mounted on said wheeled frame, mechanism mounted on said frame for elevating the crushed ice from the ice breaking and crushing mechanism, delivery chutes carried by said frame for discharging the crushed ice from the elevating mechanism to the bunkers of the refrigerator cars, a salt bin carried by said frame, a salt conveying and elevating mechanism mounted on said frame for elevating the salt, salt delivery chutes carried by said frame for discharging the salt from the salt conveying and elevating mechanism to the crushed ice chutes, an ice block conveying mechanism for continuously supplying ice blocks to said unit, means carried by said wheeled frame for deflecting the ice blocks from said ice block conveyor to said ice breaking and crushing mechanism, an operator's station carried by said wheeled frame positioned at a level above the tops of the refrigerator cars, a variable speed transmission mounted on said wheeled frame and operatively connected to the salt conveying and elevating mechanism for varying the amount of salt discharged into the crushed ice chutes, and control means for said variable speed transmission operable from said operator's station.

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## Certificate of Correction

Patent No. 2,544,431 March 6, 1951

HAROLD O. McLAIN ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 9, lines 21, 29, 35, 45, and 51, for the claim reference numeral "2" read *1*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 8th day of May, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
*Assistant Commissioner of Patents.*