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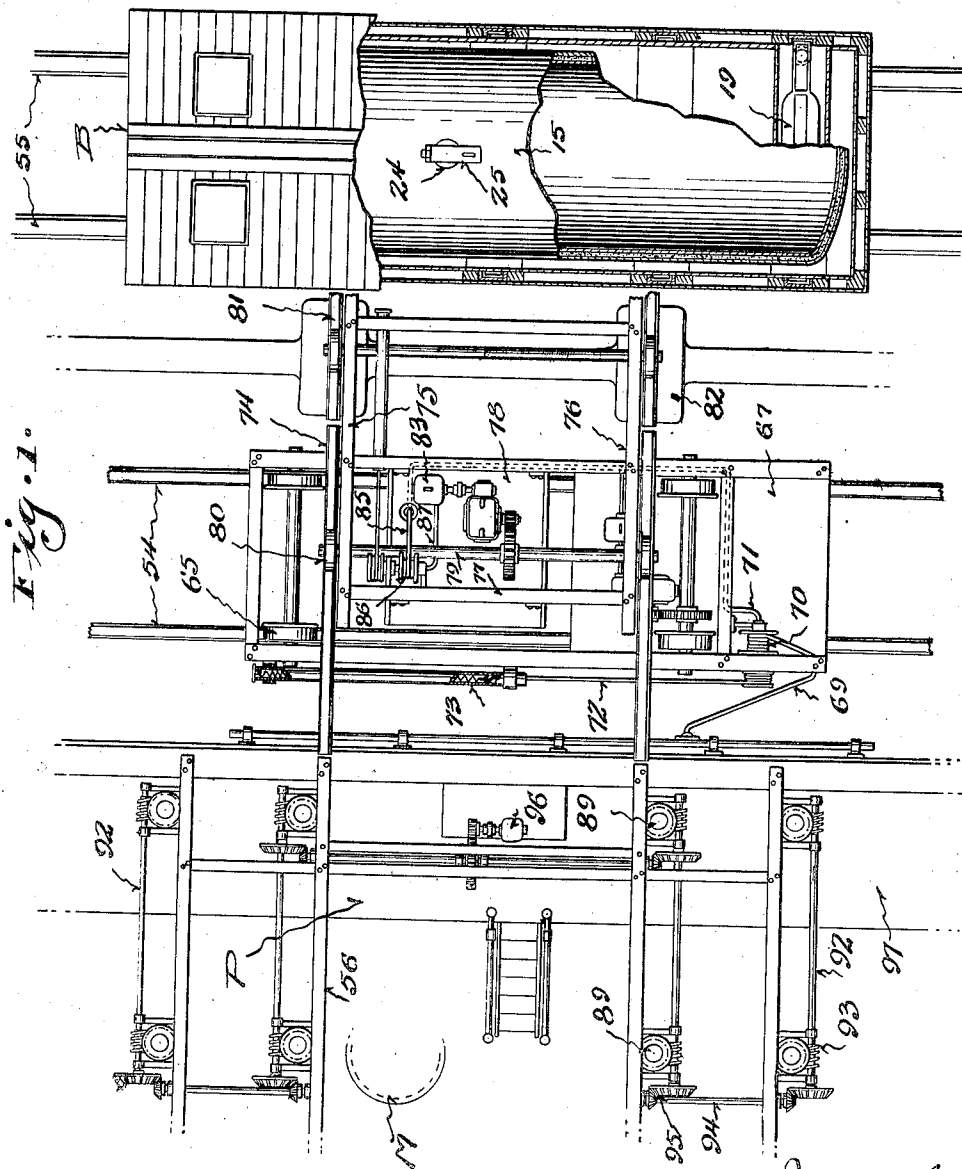
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2,102,844

APPARATUS FOR HANDLING LIQUID PRODUCTS

Filed Jan. 4, 1935

4 Sheets-Sheet 1



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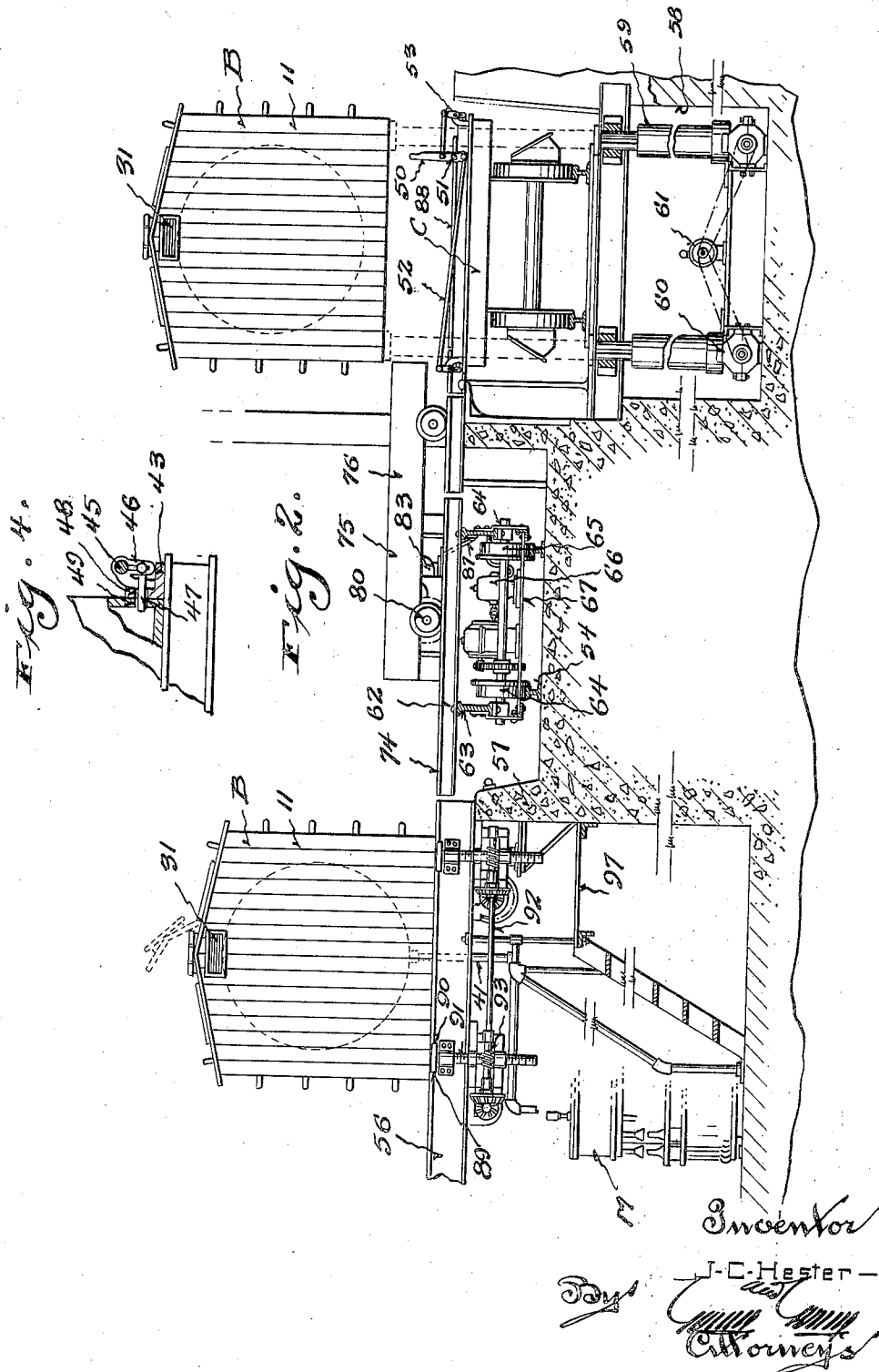
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APPARATUS FOR HANDLING LIQUID PRODUCTS

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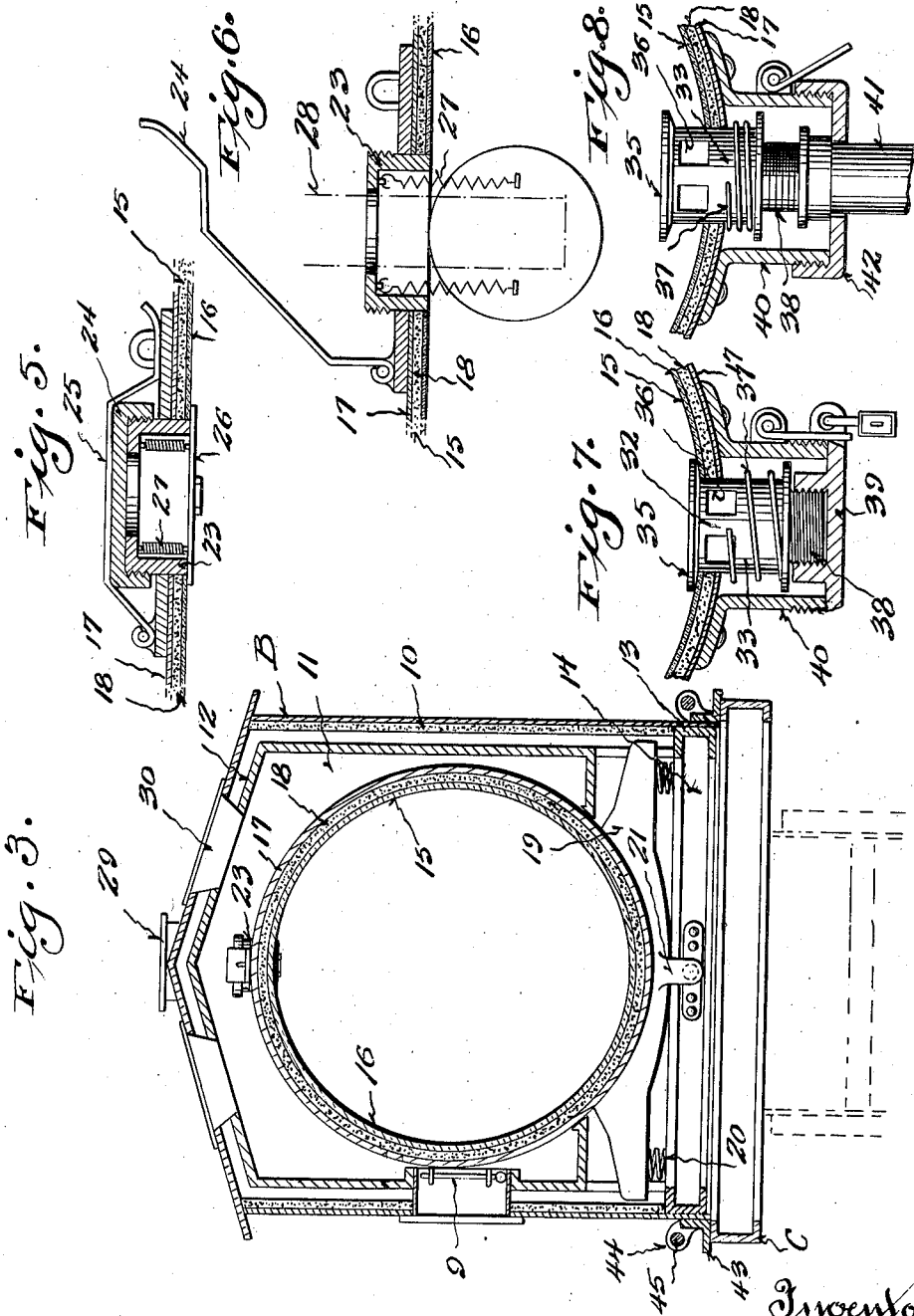
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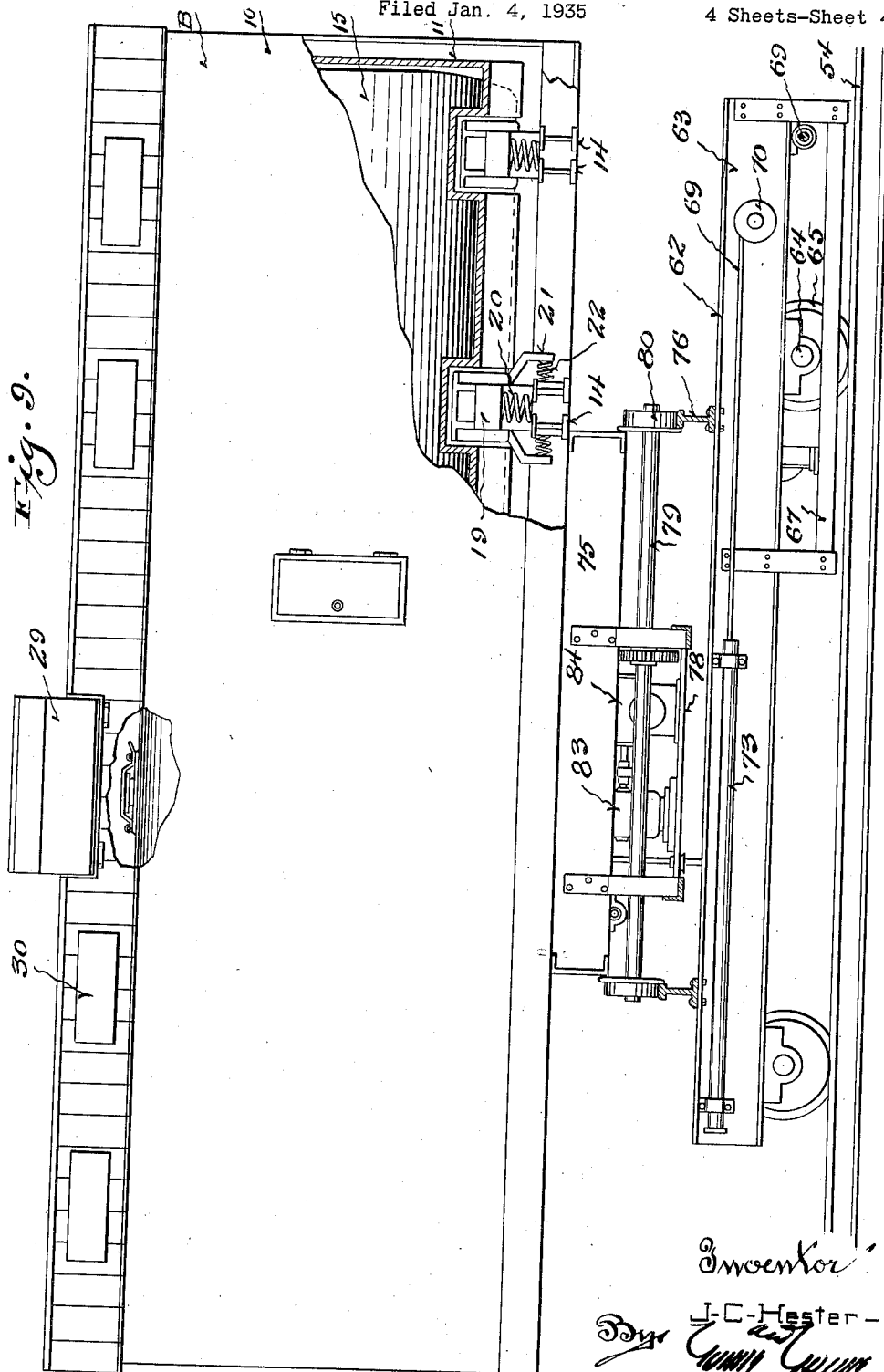
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,102,844

APPARATUS FOR HANDLING LIQUID PRODUCTS

John C. Hester, Milwaukee, Wis., assignor of one-fourth to Donald A. Harris, one-fourth to Edward A. Bornfleith, and one-fourth to Godfrey Oestrich, all of Milwaukee, Wis.

Application January 4, 1935, Serial No. 380

6 Claims. (Cl. 214—38)

This invention appertains to a novel means for handling and shipping liquids in large quantities, such as from a central distributing station, to widely separated and remote points.

In some lines of industry, such as in the brewing of beer, it is customary to fill bottles at the brewery, and then ship these filled bottles in cases, via railroad or trucks, to different points throughout the country. The expense of handling the bottles and their cases is enormous. Not only do the cases and bottles take up unnecessary space in the cars, but after the contents of the bottles have been sold, the bottles and cases have to be shipped back to the brewery for re-filling.

One of the salient objects of my invention is to provide means for eliminating the necessity of shipping the beer from the brewery in cases, and to provide novel means for handling the beer, or other liquids, in bulk, whereby the liquid can be economically shipped from the brewery in large tanks to a bottling plant located at a point distant from the brewery, and the liquid run directly from the tanks into the bottles for distribution to the local trade.

Another important object of my invention is to provide novel means for removably mounting the tanks on rolling stock, such as railroad cars, whereby the tanks can be filled at the brewery and placed on the cars, and thereafter hauled to the bottling plant and removed from the cars directly into the plant, so that the beer can be run from the tanks into the bottles, or other receptacles, to be filled for local distribution.

Another prime object of my invention is the provision of means arranged under a railroad track, whereby the car bodies containing the tank can be lifted above the railroad car chassis, so that a rail truck can be placed under the car bodies to facilitate the easy moving of the car bodies into the bottling plant.

Another object of my invention is the provision of novel means for forming the rail truck itself, and novel means for arranging the truck relative to a bottling plant, whereby the truck can be moved longitudinally relative to a railroad train and the bottling plant, and transversely to receive the car bodies, so that when the bodies are transferred from the train to the rail truck, the rail truck can be alined with the transversely extending tracks at the bottling plant, to permit the rail truck and the body to be moved bodily into the bottling plant.

A further object of my invention is the provision of novel means in the bottling plant for receiving the car bodies and tanks, so that the rail trucks can be freed of their load for handling other car bodies in the train.

A further object of my invention is the provision of a spotting or alining rail truck movable longitudinally of a train, and longitudinally of the bottling plant, having mounted thereon a transversely movable transfer truck capable of movement under an elevated car body and into a bottling plant.

A further object of my invention is the provision of novel means for forming the railroad car bodies with their tanks, and the railroad car chassis, whereby the car bodies can be detachably locked to the chassis to insure the proper traveling of the car bodies during the hauling thereof over a railroad.

A further object of my invention is the provision of novel means for supporting the tanks themselves within the car bodies, both transversely and longitudinally, whereby to effectively lessen the transmission of shocks from the car body to the tanks.

A further object of my invention is the provision of novel transportation tanks having a glass liner, and an outer protecting shell, whereby to protect the liquids being shipped against contamination.

A further object of my invention is the provision of novel means for forming the tank car bodies, whereby the beer in bulk will be kept at a proper temperature during shipping, so that the same will reach the bottling plant in the same condition as when the liquid left the brewery.

A still further object of my invention is to provide a novel system for handling liquids in bulk, which can be economically practised, and which will effectively cut down the shipping cost of bottled goods.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawings, in which drawings:—

Figure 1 is a fragmentary top plan view of my invention applied to a bottling plant, with a railroad car constructed in accordance with my invention, the car being shown broken away in section to illustrate the novel construction thereof, the bottling plant being shown diagrammatically.

Figure 2 is a vertical section showing the arrangement of my novel transfer mechanism at a

bottling plant, one of the car bodies being shown raised from the railroad car chassis for receiving my transfer truck, and another of said car bodies being shown moved into the plant and in its lowered position.

Figure 3 is a vertical section through one of the car bodies constructed in accordance with my invention, in its lowered position on a railroad car chassis, the figure illustrating the novel means for resiliently supporting the tank.

Figure 4 is a detail fragmentary view illustrating the novel means employed for detachably locking the car body on a railroad car chassis.

Figure 5 is an enlarged detail sectional view illustrating the filling cap for the tank.

Figure 6 is a view similar to Figure 5, with the cap in its open position to permit the tank to be filled with liquid.

Figure 7 is an enlarged detail fragmentary section through the bottom of a tank, illustrating the outlet for the liquid.

Figure 8 is a view similar to Figure 7, showing the outlet in its open position, and the outlet pipe connected therewith.

Figure 9 is a side elevation of one of my improved car bodies taken on a greater scale than Figures 1 and 2, showing the same on the transfer truck, and on the spotting or alining truck, the car body being shown partly in section to illustrate structural details.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter B generally indicates one of the car bodies constructed in accordance with my invention, and, as shown in the drawings, these car bodies are adapted to be mounted upon railroad car chassis C. While I have described and illustrated the bodies B for railroad trains only, it is to be understood that the bodies B can be built on a smaller scale for use on automobile trucks and trailers, and in fact such use is contemplated and forms the subject matter of a separate application for patent.

The car chassis C are substantially of conventional construction, with the exception of certain changes, which will be specifically described.

Referring more particularly to the car bodies B, it will be noted that the same are of the refrigerating type, and include insulated side walls 10, end walls 11, and a top wall 12. These bodies are built upon longitudinally extending channel beams 13, and transversely extending connecting cross beams or sleepers 14.

Arranged within the insulated walls is the shipping tank 15, which is also formed in a novel manner. This shipping tank includes a glass liner 16, and an outer protecting shell 17, which can be formed from a suitable metal. Between the glass liner 16, and the protecting shell 17, I prefer to provide a space which can be filled with pitch 18, or some other similar material.

The tank 15 is supported within the car body in a novel manner, and I provide transversely extending bolsters 19, arranged at spaced points throughout the length of the car body. These bolsters extend above the sleepers 14, and have their intermediate portions rockably mounted on the sleepers. Interposed between the ends of the bolsters and sleepers 14 are relatively heavy shock absorbing coil springs 20. The sides of the bolsters 19 have formed thereon at their central portions depending arms 21, and expansion coil springs 22 are interposed between the arms 21 and the sleepers 14. The tank rests directly upon

the bolsters, and the bolsters can be rigidly secured thereto if preferred, and it is to be noted that the upper faces of the bolsters are curved to conform to the configuration of the tank.

Each tank is provided with a novel inlet to permit the ready filling thereof, and in Figures 5 and 6 I have illustrated this inlet. As shown, an inlet nipple 23 is carried by the top of the tank, and the same is exteriorly threaded for removably receiving a closure cap 24. This cap can be removably held in position by a pivoted bail 25, which in turn can be locked against unauthorized movement by the use of a suitable padlock, or the like. The inner end of the filling neck 23 forms a seat for the normally closed valve disc 26. Contractile coil springs 27 connect the disc with the tank, and hold the disc firmly seated against the inner edge of the tank.

When it is desired to fill the tank, the hasp 25 is swung to its open position, and the closure cap 24 is removed.

The filling pipe 28, as shown in dotted lines in Figure 6, is inserted through the neck and into the tank, which will move the disc 26 off of the neck and at one side of the tank. Obviously, the tank can now be readily filled. The top of the car body B can be provided with a removable door 29 to permit access to be had to the inlet. The top of the car is also provided with trap doors 30, to permit the body to be packed with ice or other refrigerant around the tank. The car can also be provided with ventilators 31, if so desired. A thermometer 9 can be provided, whereby a ready check can be kept on the temperature of the car body, and this thermometer can be enclosed within a suitable box carried by said car body.

The tank is also provided with a novel outlet 32. This outlet includes a valve 33 slidably carried by the outlet opening formed in the bottom of the tank. This valve 33 includes a tubular sleeve, and a top valve disc 35. The valve sleeve is provided with escape openings 36, and the valve disc is normally held seated around the outlet opening by the use of an expansion coil spring 37. Obviously a gasket, or the like, can be interposed between the valve disc 35 and wall of the outlet opening. When the valve is moved to a raised position, the liquid will flow through the hollow sleeve 33 and out of the tank by means of the openings 36. In order to normally hold the valve disc tightly on its seat to prevent leakage of the beer or other liquid from the tank, the valve sleeve 33 is provided with threads 38, and a closure cap 39 is threaded thereon into tight contact with a neck 40 riveted or otherwise secured to the tank. Obviously, upon the tightening of the cap 39, the valve disc will be drawn down tightly around the outlet opening. If desired, the cap can be held in place by a key-operated lock so as to prevent unauthorized persons from manipulating the valve. When it is desired to drain the liquid from the tank, the cap 39 is removed and an outlet pipe 41 is brought into play. This outlet pipe 41 carries a threaded coupling ring 42, which is fitted on the neck 40. As the coupling is connected with the neck, the pipe 41 lifts up the valve against the tension of the spring 37, so that the liquid will readily flow from the tank into said pipe.

As heretofore intimated, the car body B is mounted upon the car chassis C in a novel manner, and the car chassis is provided with longitudinally extending, spaced parallel angle rails 43. The car body fits on to the car chassis C between

the rails 43, and these rails carry bearings 44 for rotatably supporting longitudinally extending rock shafts 45. These rock shafts carry at spaced points crank arms 46, and these crank arms are in turn provided with bolts 47 which are movable into and out of keeper recesses 48 and 49 formed in the angle rails 43, and in the side walls of the car body. The rock shafts 45 are synchronously actuated by means of a hand lever 50 located on the car chassis C adjacent to one end thereof. This hand lever is rockably mounted intermediate its ends, as at 51, on the car chassis, and has pivotally connected thereto on opposite sides of the pivot 51 links 52, which are in turn pivotally connected to cranks 53 keyed or otherwise secured to the rock shafts. Thus, by manipulating the hand lever 50, the bolts 49 can be moved into and out of the keeper recesses in the car body.

As brought out in the objects of the specification, it is one of the salient features of the invention to provide means for lifting the car bodies B from the car chassis C into a bottling plant, which is remotely located relative to the brewery, and to run the liquid directly from the tanks into the bottles. Hence, at the bottling plant novel means is provided for receiving and handling the car bodies.

As shown in Figures 1 and 2, a railroad track 54 is led parallel to and alongside of the track 55 of the railroad over which the car bodies are hauled. The railroad track 55 may be a spur leading from the main railroad track into the yard of the bottling plant. Only a fragment of the bottling plant has been shown, and the same is indicated generally by the letter P.

The railroad track 54 also extends longitudinally of the bottling plant, and thus the bottling plant P can be provided with any desired number of bottling machines M. These bottling machines M are preferably located in a plane below the railroad tracks 54 and 55, so that the liquid in the tanks can readily gravitate therefrom into the bottling machines, but obviously pressure can be utilized for forcing the liquid from the tanks. Adjacent to each bottling machine M, and preferably over the top of the same, I arrange a pair of rails 56, which extend transversely to the tracks 54 and 55, and in a plane above these tracks. The rails 56 are rigidly supported in any preferred manner, such as by concrete or other walls or pillars 57.

A portion of the railroad track extends over a pit 58, and in this pit I arrange jacks 59 for elevating the car body B from off of its car chassis C, for a purpose which will be later set forth. The jacks 59 can be of any desired type, and the same are arranged at spaced points for permitting the convenient raising of the car bodies. In the present instance the jacks 59 can be considered as of the hydraulic type, and the same can be provided with pumps 60 for the liquid, and these pumps can be driven from an electric motor 61. When the jacks are elevated, the same ride between the girders of the car chassis and under the car body.

Movably mounted on the tracks 54 is what I term a spotting or alining truck, generally indicated by the reference character 62. This spotting or alining truck 62 may comprise a pair of spaced parallel, longitudinally extending main beams or girders 63, which carry car trucks 64. These trucks 64 include car wheels 65, which ride on the tracks 54. While the alining or spotting truck might possibly be moved by man, I prefer to provide mechanical means for moving the same.

Thus an electric drive motor 66 is mounted on a platform 67, swung from the main beams 63, and this motor is connected through the medium of a reduced speed transmission 64 to one axle of the car truck. Means must be provided for conducting the electric current for the motor 66, during the travel of the spotting truck, and to take care of this contingency I provide a relatively long electric cable 69. The cable is paid off and on a rotatable spool 70 carried by the spotting truck. This cable can lead from any suitable source of electrical energy.

The inner ends of the cable (not shown) are connected to suitable conductors, which are in turn electrically connected with a cable 71 led to the motor. The spool and its electric connections are of standard construction, and form no part of my present invention other than the association thereof with my spotting truck.

In order to take up slack in the cable 69, and to wind the cable up on the spool 70, I provide means for rotating the spool in one direction. This means may consist of a pull cord 72 wound upon a portion of the spool, and one end of this pull cord 72 is connected to one end of an elongated expansion coil spring 73, which creates a constant tension on the pull cord.

Mounted upon the spotting truck 62 is a pair of spaced rails 74, and on these rails is mounted a transfer truck 75. The transfer truck 75 includes spaced beams 76 and connecting cross beams 77, which support a platform 78. The transfer truck 75 also includes axles 79 on which are mounted car wheels 80, which are adapted to travel on the rails 74 of the spotting truck. Thus the transfer truck is mounted for movement transversely of the movement of the spotting truck. The rails 74 on the spotting truck are the same distance apart as the rails 56, which lead into the bottling plant P, and the same distance apart as the rails 81, which are mounted between the tracks 54 and 55. These rails 81 are supported on suitable abutments 82 arranged between the tracks 54 and 55. It is also preferred to drive the transfer truck by motive power, and thus an electric motor 83 is mounted on the platform 78, and is connected to one axle 79 through the medium of a speed reducing mechanism 84. An electric cable 85 is electrically connected with the lead off cable 71 of the spotting truck 62, and this cable 85 is also paid on and off a spring-controlled drum 86 mounted on the transfer truck. The cable 86 is electrically connected with suitable conductors, which have in turn electrically connected therewith a cable 87 leading to the motor 83.

In the operation of my improved transportation system, the loaded cars are hauled to the bottling plant P on the tracks 55 adjacent to the rails 81 and over the pit 58. The locking bolts 47 are now operated to release the car body, and the jacks 59 are elevated to raise the car body above the car chassis C. Removable, short rail sections 88 are placed on the car chassis C below the car body B, and in alinement with the rails 56 and 81. The spotting or alining truck 62 is now set in motion until its rails 74 aline with the rails 56 and 81, at which time the spotting truck is stopped, and the transfer truck 75 is moved over the rails 74 on to the rails 81, and then on the rails 88 below the car body B. The jacks 59 are again operated so as to lower the car body on the transfer truck. The electric motor 83 of the transfer truck is again started, and the transfer truck with the car body B is moved on to the

spotting truck 62, and then on to the rails 56 into the bottling plant above the bottling machine M.

Means is provided at this point for again raising the car body B so that the transfer truck can be slid back on to the spotting truck 62, whereby another car body can be removed from the train on the tracks 55 into the bottling plant above another bottling machine, it being understood that the bottling plant is provided with a series of pairs of rails 56, and a series of bottling machines M.

Considering that a car body B has been moved into the bottling plant, and off of the transfer truck, and the transfer truck has been returned to the spotting truck, the car body B is lowered on to the rails 56. The employees at the bottling plant now remove the cap 39 from the bottom of the tank of the car body, and the outlet pipe 41 is coupled therewith. As shown in Figure 1, the pipe 41 leads directly to the bottling machine.

Any preferred type of jacks 89 can be employed in the bottling plant for raising and lowering the car bodies on the rails 56, and, as shown, the same are of the screw type. The jacks are arranged at spaced points best suited for handling a car body, and each includes a lifting head 90 and a threaded shank 91. By referring to Figure 1, it can be seen that the jacks are arranged in transversely aligned pairs, and the pairs of jacks are actuated by transversely extending rotatable shafts 92 having worms 93 keyed thereto which mesh with the threads on the shanks 91. Certain of the shafts 92 are operatively connected together by jack shafts 94, and beveled gears and pinions 95. Any desired means can be provided for operating the shafts, and in the present instance I have illustrated an electric motor 96, which is connected through a gear mechanism with the desired shafts of the jacks.

The bottling plant is especially arranged to receive the car bodies, and a platform 97 may be built under the rails 56 so as to facilitate the work of the employees incident to the operation of the jacks, and the draining of the car tank.

From the foregoing description, it can be seen that I have provided an exceptionally efficient means for handling and shipping liquids in bulk, whereby such liquids can be economically transported.

Changes in details may be made without departing from the spirit or the scope of this invention, but what I claim as new is:—

1. In a device for handling material in bulk, a receiving station having one or more pairs of spaced parallel rails, a track extending longitudinally of the receiving station and at right-angles to the rails, a roadway parallel to the receiving station, a wheeled chassis movable over the roadway, a pit in said roadway located below the track and the rails of the receiving station, a removable car body on the chassis, means in the pit for elevating the body above the chassis, said means being entirely movable in the pit below the roadway when the same are not in use, a spotting truck movable over the track having a pair of transversely extending rails movable with the truck into and out of alinement with the rails of the receiving station, a transfer truck independent of the car body and supporting truck and normally mounted on the rails of the spotting truck and movable on to the rails of the receiving station when the rails of the truck are in alinement with the rails of the receiving station, and rails for the car chassis whereby the

transfer truck can be moved under the elevated body when the rails of the spotting truck are in alinement with said last mentioned rails.

2. In a device for handling material in bulk, a receiving station having one or more pairs of spaced parallel rails, a track extending longitudinally of the receiving station and at right-angles to the rails, a roadway parallel to the receiving station, a wheeled chassis movable over the roadway, a pit in said roadway located below the track and the rails of the receiving station, a removable car body on the chassis, means in the pit for elevating the body above the chassis, said means being entirely movable in the pit below the roadway when said means is not in use, a spotting truck movable over the track having a pair of transversely extending rails movable with the truck into and out of alinement with the rails of the receiving station, a transfer truck independent of the car body and supporting truck and normally mounted on the rails of the spotting truck and movable on to the rails of the receiving station when the rails of the truck are in alinement with the rails of the receiving station, rails for the car chassis whereby the transfer truck can be moved under the elevated body when the rails of the spotting truck are in alinement with said last mentioned rails, and means for power operating the spotting truck.

3. In a device for handling material in bulk, a receiving station having one or more pairs of spaced parallel rails, a track extending longitudinally of the receiving station and at right-angles to the rails, a roadway parallel to the receiving station, a wheeled chassis movable over the roadway, a pit in said roadway located below the track and the rails of the receiving station, a removable car body on the chassis, means in the pit for elevating the body above the chassis, said means being entirely movable in the pit below the surface of the roadway when said means is not in use, a spotting truck movable over the track having a pair of transversely extending rails movable with the truck into and out of alinement with the rails of the receiving station, a transfer truck independent of the car body and supporting truck and normally mounted on the rails of the spotting truck and movable on the rails of the receiving station when the rails of the truck are in alinement with the rails of the receiving station, rails for the car chassis whereby the transfer truck can be moved under the elevated body when the rails of the spotting truck are in alinement with said last mentioned rails, and means for power operating the spotting truck and the transfer truck.

4. In a device for handling material in bulk, a receiving station having one or more pairs of spaced parallel rails, a track extending longitudinally of the receiving station and at right-angles to the rails, a roadway parallel to the receiving station, a wheeled chassis movable over the roadway, a pit in said roadway located below the track and the rails of the receiving station, a removable car body on the chassis, means in the pit for elevating the body above the chassis, said means being normally movable entirely in the pit below the surface of the roadway when said means is not in use, a spotting truck movable over the track having a pair of transversely extending rails movable with the truck into and out of alinement with the rails of the receiving station, a transfer truck independent of the car body and supporting truck and normally mounted on the rails of the spotting truck and movable

on the rails of the receiving station when the rails of the truck are in alinement with the rails of the receiving station, rails for the car chassis whereby the transfer truck can be moved under the elevated body when the rails of the spotting truck are in alinement with said last mentioned rails, means for power operating the spotting truck and the transfer truck, and means for raising and lowering the car body in the receiving station.

5. In a device for handling material in bulk, a receiving station having at least a pair of transversely extending rails leading into the same, a railroad track paralleling the receiving station and at rightangles to the rails of the receiving station, a roadway having a pit therein arranged longitudinally of the track and a material distance below the surface of the same, a wheeled car chassis movable over the pit, a car body for the chassis, means for detachably locking the body to the chassis, jacks in said pit for elevating the body above the chassis when the body is released from said chassis, said jacks being normally movable in the pit below the surface of the roadway when the jacks are not in use, a spotting truck movable over the track, and a transfer truck normally carried by the spotting truck movable under an elevated car

body and on to the rails of the receiving station.

6. In a device for handling material in bulk, a receiving station having at least a pair of transversely extending rails leading into the same, a railroad track paralleling the receiving station and at rightangles to the rails of the receiving station, a roadway having a pit therein arranged longitudinally of the track and located a material distance below the surface of the roadway and the track and transversely extending rails, a wheeled car chassis movable over the pit, a car body for the chassis, means for detachably locking the body to the chassis, jacks in said pit for elevating the body above the chassis when the body is released from said chassis, said jacks being movable entirely in the pit below the surface of the roadway when the jacks are not in use, rails movable under an elevated body on the chassis, a spotting truck movable over the track, a transfer truck normally carried by the spotting truck movable onto the last mentioned rails under an elevated car body and on to the rails of the receiving station, and jacks in said receiving station for elevating the body off of the transfer truck to permit the removal of said transfer truck and for lowering the body on to the rails.

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