J. C. YOUNGBLOOD.

LIFT DECK FOR FREIGHT CARS.

APPLICATION FILED FEB. 12, 1917.

1,229,374.

Patented June 12, 1917.

2 SHEETS—SHEET 1.

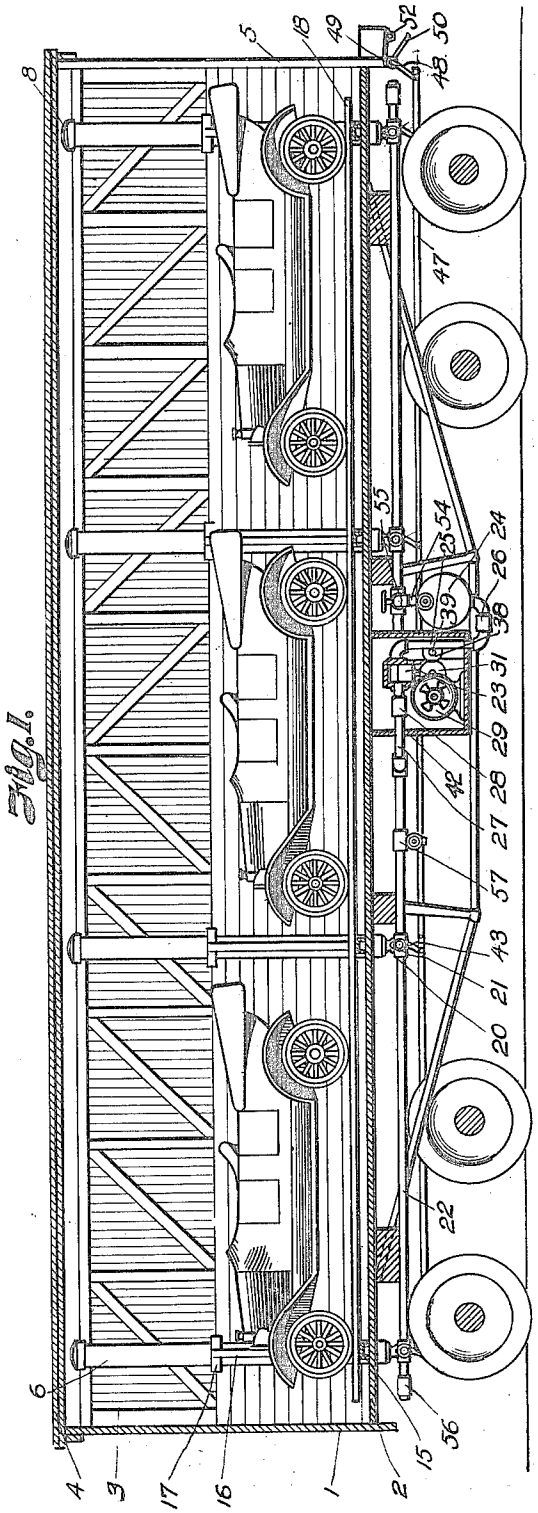


Fig. I.

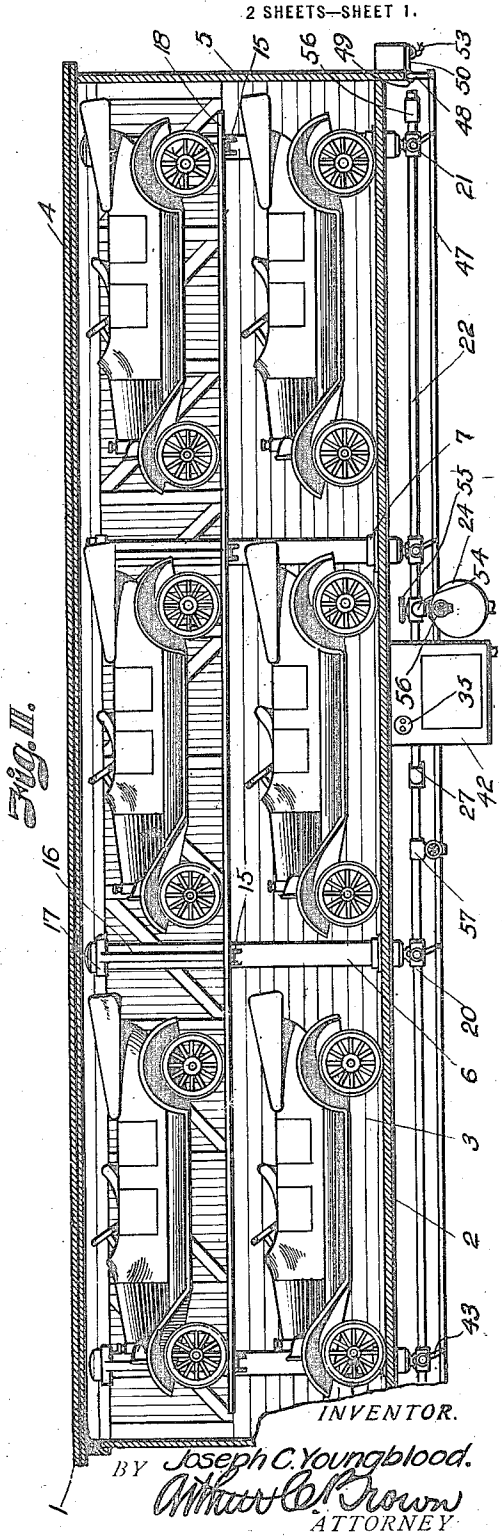


Fig. II.

INVENTOR.

BY Joseph C. Youngblood.

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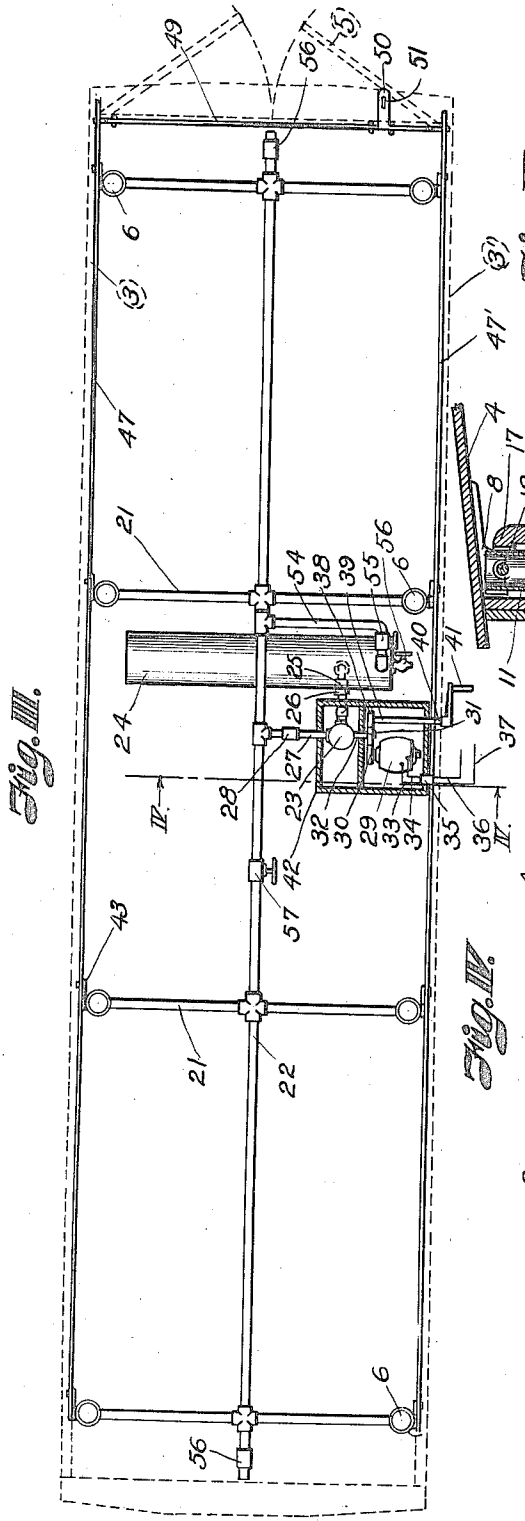


Fig. III.

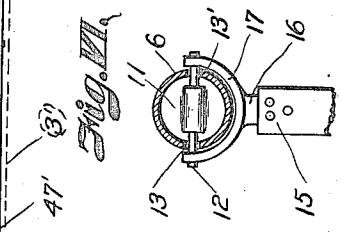


Fig. VI.

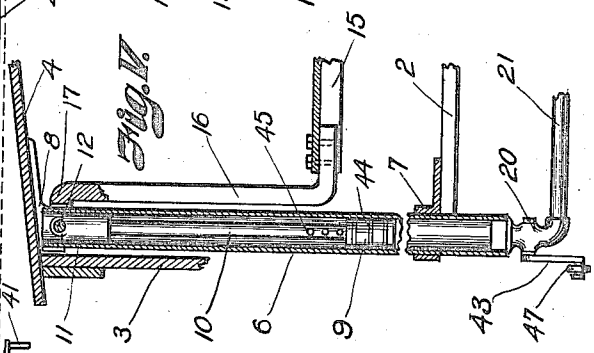


Fig. V.

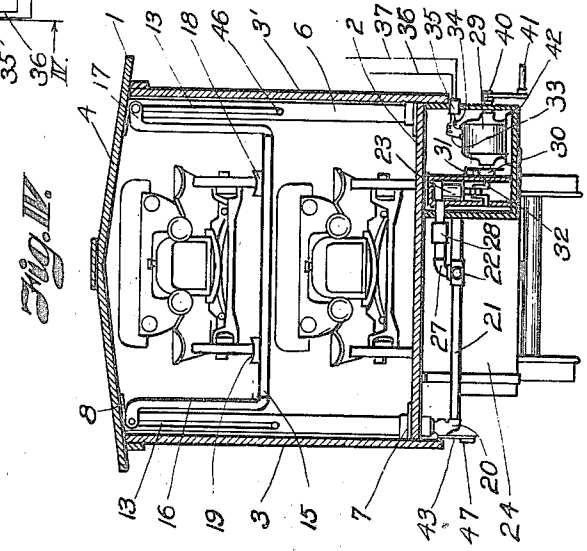


Fig. IV.

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UNITED STATES PATENT OFFICE.

JOSEPH C. YOUNGBLOOD, OF ATWOOD, KANSAS.

LIFT-DECK FOR FREIGHT-CARS.

1,229,374. Specification of Letters Patent. Patented June 12, 1917.

Application filed February 12, 1917. Serial No. 148,289.

To all whom it may concern:

Be it known that I, JOSEPH C. YOUNGBLOOD, a citizen of the United States, residing at Atwood, in the county of Rawlins and State of Kansas, have invented certain new and useful Improvements in Lift-Decks for Freight-Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a lift deck for freight cars, and more particularly to a device of this character adapted to facilitate the loading, shipping, and the unloading of automobiles, or the like, from freight cars, the principal object of the invention being to construct a movable floor or deck that may be easily and quickly lowered onto the main car floor to make the loading of automobiles thereon an easy matter and which after being loaded may be raised to such a position as to permit the loading of automobiles within the lower portion of the car.

It is an object of the invention to provide simple and effective means for operating the lift deck and to so locate and arrange the lifting mechanism that it will in no way interfere with the shipping of goods other than automobiles, at times when such shipments are not being made.

To persons familiar with the methods employed in shipping automobiles in car load lots, it is known that a temporary deck or floor is built within the car at the time of each shipment, on which a row of automobiles may be supported above a similarly placed row that is loaded on the main floor of the car, and by building such a deck the shipping capacity of the car is practically doubled. However, such a method of loading has proven, not only costly and inconvenient to shippers and dealers, but is also unsatisfactory to the car owners as the repeated installation and removal of such built in decks materially injures the car.

It is therefore, an object of the present invention to provide a deck which may be made as a permanent part of a car and will serve to a better advantage and ultimately at a lesser expense all the purposes of the built in deck and which may be lowered when not in use to such a position on the car floor that it will in no way interfere with the ordinary shipping facilities of the car.

In accomplishing these objects I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:—

Figure I is a longitudinal section through a freight car showing a lift deck constructed according to the present invention, the deck being shown in lowered position.

Fig. II is a similar view showing the deck in its raised position, and illustrating the double tier loading of automobiles within the car.

Fig. III is a plan view showing the relative location of the hoisting cylinders, and their pipe connections with the supply tank and pressure pump.

Fig. IV is a transverse vertical section through the car on the line IV—IV, Fig. III.

Fig. V is an enlarged sectional view of one of the cylinders showing a piston and its connection with a hanger arm for supporting the deck.

Fig. VI is a cross section through a cylinder showing the connection of the yoke arm to the piston rod.

Referring more in detail to the drawings:

1 designates a freight car of any ordinary construction comprising a floor 2, side walls 3—3′, a roof 4 and end opening doors 5.

Mounted within the car at opposite points, and adjacent the side walls 3—3′ are vertically arranged cylinders 6, each of which is substantially supported at its lower end by means of a collar 7 which is attached to the cylinders and seats on the floor 2, and at its upper end by a similar collar 8 which is fastened to the roof 4 to hold the cylinder rigidly in an upright position.

Slidably contained within each cylinder is a piston 9 having an upwardly extending rod 10 attached thereto which carries at its upper end a guide piston 11 and a cross rod 12, the ends of which extend from opposite sides of the cylinder through longitudinally extending slots 13—13′ in the cylinder walls and are adapted for guided travel therein.

Located within the car and adapted for vertical travel between the oppositely arranged cylinders 6 is a lift deck comprising cross beams 15 preferably of channel iron construction, which extend transversely across the car between paired cylinders and are at-

tached at their opposite ends to hanger arms 16, the latter having yoke portions 17 at their upper ends which partially inclose the cylinders 6 and are anchored to the projecting ends of the cross pins 12 at the upper ends of the piston rods 10.

Extending longitudinally within the car and supported on the cross beams 15 are floor plates 18 which are placed in parallel relation to receive the wheels of automobiles that may be loaded thereon and are preferably provided with cupped upper faces 19 to substantially seat the wheels and prevent their displacement therefrom.

The lower ends of the cylinders 6 terminate below the level of the floor 2 and are closed by means of valved fittings 20 which may be threaded thereinto, and leading to the valves are branch pipes 21 which extend from a central pipe line 22 carried longitudinally beneath the car floor and into which oil, or other suitable pressure fluid, may be forced by a pump 23 from a supply tank 24.

The preferred manner of connecting the pump with the supply tank 24 and central pipe line 22 comprises a pipe 25 which leads from the lower side of the tank to the pump and is provided with an automatic check valve 26 whereby the flow of liquid is permitted toward the pump but is prevented from going in an opposite direction. A pipe 27 also leads from the pump cylinder to the pipe line 22 and is similarly provided with a check valve 28 to prevent a backward flow of the pressure medium.

The pump used may be of any suitable construction as long as it may be conveniently located and operated, the preferred manner of operation consisting in mounting an electric motor 29 adjacent the pump and connecting it thereto by means of a gear wheel 30 mounted on the motor shaft and meshing with a gear wheel 31 on the pump operating shaft 32, and connecting the motor by means of circuit wires 33—34 with a plug 35 mounted in the car wall to which circuit wires 36—37 may be connected to energize the motor.

Also meshing with the gear wheel 31 is a smaller gear wheel 38 that is mounted on a shaft 39 which extends to an accessible point at the side of the car and is provided with a wrench head 40 for receiving a crank 41 so that where an electric current is not available to operate the motor or when a motor is not installed, the pump may be manually operated by use of the crank.

The pump and motor may be supported and housed in a casing 42 which is suspended beneath the car floor by any suitable means and the parts are thereby protected from foreign matter and unauthorized tampering.

With this manner of connection it will be seen that on energization of the motor 29, or by the turning of the shaft 39 by use of the crank 41, the pump will be actuated to force the oil from the storage tank 24 into the pipe line 22 from which it is distributed by the pipes 21, through the valves 20 into the cylinders 6 to actuate the pistons upwardly within the cylinders to raise the deck carried thereby.

When the deck is in its lowered position the beams 15 rest on the floor 2 as shown in Fig. I and the pistons 9 are positioned adjacent the lower ends of the cylinders 6, but as the oil, or other pressure medium which may be used, is forced by the pump 23 into the pipe lines and distributed to the cylinders the pistons are moved upwardly and by means of the piston rods 10 and hanger arms 16, the deck is raised from the floor correspondingly with the movement of the pistons.

I have also provided each of the valves 20 at the base of the cylinders 6 with actuating levers 43 which may be moved after the deck has been raised to a desired level to close the valve and prevent any possible backflow of the pressure fluid from the cylinders and to hold the deck in its elevated position, but which are normally left open to permit the passage of the pressure medium to and from the cylinders, and I also provide each of the pistons with one or more packing rings 44 which will effectively prevent leakage about the pistons so that the pressure medium cannot escape.

In order to prevent any possible downward movement of the raised deck during a shipment and to relieve the cylinders and pipe lines from continued pressure I provide each of the piston rods 10 with a plurality of apertures 45 adapted to receive pins 46 which may be extended therethrough and through the opposite slots 13—13′ in the cylinders 6 so that the ends of the pins may seat at the base of the slots and support the pistons within the cylinders. When it is desired to lower the deck the pins are removed to permit free movement of the piston rods.

I also provide means for simultaneously opening or closing the valves 20, which comprises rods 47—47′ that extend longitudinally at opposite sides of the car and are pivotally connected with the valve actuating levers 43, and at one end of the car are connected to the downwardly extending arms 48 of a locking bar 49 that extends transversely across the end of the car and has a forwardly extending arm 50 provided with an eye 51 for receiving a fixed bolt 52 for taking a seal band 53 to lock the valves in closed position; the parts being so arranged that when the arm 50 is moved downwardly from the bolt 52 the arms 48 are moved rearwardly, to actuate the rods 47—47′ to simultaneously open the valves

20 and when moved to locking position the valves are simultaneously closed.

A return pipe 54 connects the pipe line 22 with tank 24, and has a valve 55 therein, which is necessarily closed while the deck is being raised or is in raised position but may be opened when it is desired to lower the deck to permit the return flow of the pressure medium from the cylinders 6 into the tank 24.

Safety valves 56 are installed at each end of the main pipe line 22 which will automatically open if an over pressure should be reached, so that injury to the parts is avoided. A drain valve 57 in the pipe line 22 is provided so that when it is desired, the system may be conveniently drained of its pressure medium, and the tank 24 is also equipped with a valve 56 for permitting the intake or exhaust of air while the pressure medium is being pumped therefrom or returned thereto from the system.

Assuming that the parts are so constructed and assembled in a car, and the movable deck is at its lower limit on the car floor 2, and it is desired to load the car with automobiles or the like, the latter are moved into the car through the end door 5 and placed on the floor plates 18. When the deck has been loaded the motor is energized, by the connection of the circuit wires 36—37 with the motor plug 35, to operate the pump and the pressure medium is forced from the tank 24 into the pipe line 22 and is distributed by the branch pipes 21 through the valves 20 into the cylinders 6, where it effects an upward movement of the pistons 9 and through the connection of the piston rods 10 and hanger arms 16 causes the lifting of the deck.

When the deck has been raised to the desired height the pins 46 are inserted through the rod apertures and cylinder slots 13—13′ and the valves 20 are closed by actuation of the lever arm 51 to prevent any possible back flow of the fluid from the cylinders and the deck is thereby held in elevated position. With the deck so elevated additional automobiles may then be loaded within the car beneath the suspended floor. The arm 51 is then locked by a seal to the bolt 52 and the car is ready for shipment.

When the car has reached its destination and it is desired to unload the same, the automobiles on the car floor 2 are first removed. The deck 6 is then lowered after removing the pins 46 by opening the valves 20 in the branch pipes 21 and the valve 55 in the return pipe 54 which will allow the oil in the cylinders, under pressure of the pistons 9, to be forced back into the supply tank 24 and the deck will gradually settle to its lower position on the car floor 2, where the automobiles or other articles thereon may be quickly and easily removed.

While I have shown spaced floor plates 18 for supporting the automobiles, it is apparent that a solid floor could be laid on the cross beams 15 and articles or merchandise other than automobiles could be conveniently shipped in this manner.

The particular location and manner of suspension of the supply tank 24 and the pumps and motor is immaterial as long as the parts are accessible and conveniently arranged and do not interfere with other operative parts beneath the car floor.

It will be seen that by constructing a car deck of this character, a convenient and inexpensive means is provided for shipping and loading automobiles or the like and the cost and injury to a car caused by building in a deck with each shipment is eliminated.

Having thus described my invention what I claim as new therein and desire to secure by Letters-Patent, is:—

1. In a car comprising a floor, a deck adapted for support on said floor, cylinders mounted vertically at opposite sides of said deck, pistons in said cylinders, means for operatively connecting the pistons with said deck, and means for actuating the pistons within the cylinders to raise the deck from the floor.

2. In a car comprising a floor, a deck adapted for support on said floor, cylinders mounted vertically at opposite sides of said deck, pistons in said cylinders, hanger arms operatively connecting the pistons with said deck, and means for actuating the pistons by a fluid pressure to raise said deck.

3. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck, pistons in said cylinders, hanger arms operatively connecting said pistons with the said deck, a pressure medium supply tank, a pump, and means for actuating the pump to force a pressure medium from said tank into said cylinders to actuate said pistons, for the purpose set forth.

4. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck, pistons in said cylinders, hanger arms operatively connecting said pistons with the said deck, a pressure medium supply tank, a pump, a conduit connecting said pump with said pressure medium tank, conduits leading from said pump to said cylinders, and means for actuating the pump to draw a pressure medium from said tank and force the same under pressure into said cylinders.

5. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck, pistons in said cylinders, hanger arms operatively connecting said pistons with the said deck, a pressure medium supply tank, a force pump, a conduit connecting said pump

with the supply tank and having a check valve therein for preventing back flow from the pump, a main conduit, branch conduits leading from the main conduit to each of said cylinders, a conduit leading from said pump into the main conduit and having a check valve therein for preventing back flow to the pump, and means for actuating the pump to force a pressure medium from the supply tank through said conduits into said cylinders to actuate the pistons upwardly, for the purpose set forth.

6. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck, pistons in said cylinders, hanger arms operatively connecting said pistons with the said deck, a pressure medium supply tank, a force pump, a conduit connecting said pump with the supply tank and having a check valve therein for preventing back flow from the pump, a main conduit, branch conduits leading from the main conduit to each of said cylinders, a conduit leading from said pump into the main conduit and having a check valve therein for preventing back flow to the pump, and means for actuating the pump to force a pressure medium from the supply tank through said conduits into said cylinders to actuate the pistons upwardly, and a valved conduit connecting said main conduit with said supply tank whereby a pressure medium may be returned from said cylinders into said supply tank.

7. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck in paired relation, pistons mounted in said cylinders, means operatively connecting the pistons with said deck, a pressure medium supply tank, a main distributing conduit, branch conduits leading from the main conduit and opening into the lower ends of said cylinders, a conduit connecting said main conduit within the supply tank, a pump interposed in the last named conduit, and means for mechanically or manually actuating the pump.

8. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck in paired relation, pistons mounted in said cylinders, means operatively connecting the pistons with said deck, a pressure medium supply tank, a main distributing conduit, branch conduits leading from the main conduit and opening into the lower ends of said cylinders, a conduit connecting said main conduit within the supply tank, a pump interposed in the last named conduit and having a drive shaft, a gear wheel on said shaft, and an electric motor having geared connection with said pump gear wheel to actuate said pump, for the purpose set forth.

9. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck in paired relation, pistons mounted in said cylinders, means operatively connecting the pistons with said deck, a pressure medium supply tank, a main distributing conduit, branch conduits leading from the main conduit and opening into the lower ends of said cylinders, a conduit connecting said main conduit with the supply tank, a pump interposed in the last named conduit, means for mechanically or manually actuating the pump to force a pressure medium from said tank into said cylinders to actuate said pistons to raise said deck, and valves in said conduits for controlling the flow of the pressure medium through the conduits into and from the cylinders.

10. In a car of the character described, a deck mounted within the car, cylinders mounted vertically at opposite sides of said deck, pistons in said cylinders, means for operatively connecting the cylinders with the deck, a pressure medium supply tank, conduits connecting said tank with said cylinders, a pump for forcing a pressure medium from said tank through said conduits to the cylinders, valves in said conduits, and means for simultaneously opening and closing said valves.

11. In a car of the character described, a deck mounted within the car, cylinders mounted vertically at opposite sides of said deck, pistons in said cylinders, means for operatively connecting the cylinders with the deck, a pressure medium supply tank, conduits connecting said tank with said cylinders, a pump for forcing a pressure medium from said tank through said conduits to the cylinders, valves in said conduits, and means for locking the valve actuating means in closed position.

12. In a car of the character described, a deck mounted within the car, cylinders mounted vertically at opposite sides of said deck, pistons in said cylinders, means for operatively connecting the cylinders with the deck, a pressure medium supply tank, conduits connecting said tank with said cylinders, a pump for forcing a pressure medium from said tank through said conduits to the cylinders, valves in said conduits, actuating levers extending from said valves, rods connecting said actuating levers, means for moving the rods to simultaneously open or close said valves, and means for locking the moving means in closed position.

13. In a car comprising a floor, a deck mounted on said floor, cylinders mounted vertically along opposite sides of said deck in paired relation and having oppositely disposed vertical slots therein, pistons mounted in said cylinders, rods extending upwardly from said pistons within said cyl-

inders, pins mounted at the upper ends of said rods and having ends extending outwardly from said cylinders and slidable in said cylinder slots, hanger arms suspended from said pins and connecting with said deck, and means for actuating the pistons within the cylinders to raise and lower said deck, for the purpose set forth.

14. In a car of the character described, cylinders mounted along opposite sides of said car in transverse paired relation and having oppositely disposed vertical slots in their upper portions, a deck mounted on said car floor comprising cross beams extending between said paired cylinders and longitudinal floor plates mounted on said cross beams, pistons mounted in said cylinders, rods extending upwardly from said pistons within said cylinders and having apertures therethrough in alinement with the cylinder slots to receive locking pins, pins mounted at the upper ends of said rods and having ends extending outwardly from said cylinders and slidable in said cylinder slots, hanger arms suspended from said pins and connected with said deck cross beams, and means for admitting a pressure medium into said cylinders to actuate the pistons vertically, for the purpose set forth.

15. In a car of the character described, cylinders mounted along opposite sides of said car in transverse paired relation and having oppositely disposed vertical slots in their upper portions, a deck mounted on said car floor comprising cross beams extending between said paired cylinders and longitudinal floor plates mounted on said cross beams, pistons mounted in said cylinders, rods extending upwardly from said pistons within said cylinders, pins mounted at the upper ends of said rods and having ends extending outwardly from said cylinders and slidable in said cylinder slots, hanger arms suspended from said pins and connected with said deck cross beams, valves at the base of said cylinders for admitting or discharging a pressure medium, and means for simultaneously opening or closing the said valves and for locking the same in closed position.

16. In a car of the character described, cylinders mounted along opposite sides of said car in transverse paired relation and having oppositely disposed vertical slots in their upper portions, a deck mounted on said car floor comprising cross beams extending between said paired cylinders and longitudinal floor plates mounted on said cross beams, pistons mounted in said cylinders, rods extending upwardly from said pistons within said cylinders having apertures therethrough in alinement with the cylinder slots for receiving locking pins, pins mounted at the upper ends of said rods and having ends extending outwardly from said cylinders and slidable in said cylinder slots, hanger arms suspended from said pins and connected with said deck cross beams, a pressure medium supply tank, a pump, a main distributing conduit, conduits connecting the pump with the said supply tank and with the distributing conduit having valves therein for preventing a back flow of the pressure medium therein, branch conduits leading from the main conduit to each of said cylinders, control valves in said branch conduits, means for manually or mechanically actuating the pump to force a pressure medium from said tank through said conduits to said cylinders to actuate the pistons upwardly, and a drain conduit leading from said distributing conduit to said supply tank having a control valve therein, for the purpose set forth.

In testimony whereof I affix my signature.

JOSEPH C. YOUNGBLOOD.