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R. A. CLAPP

COMBINATION RAILWAY CAR

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2 Sheets-Sheet 1

Fig. 1.

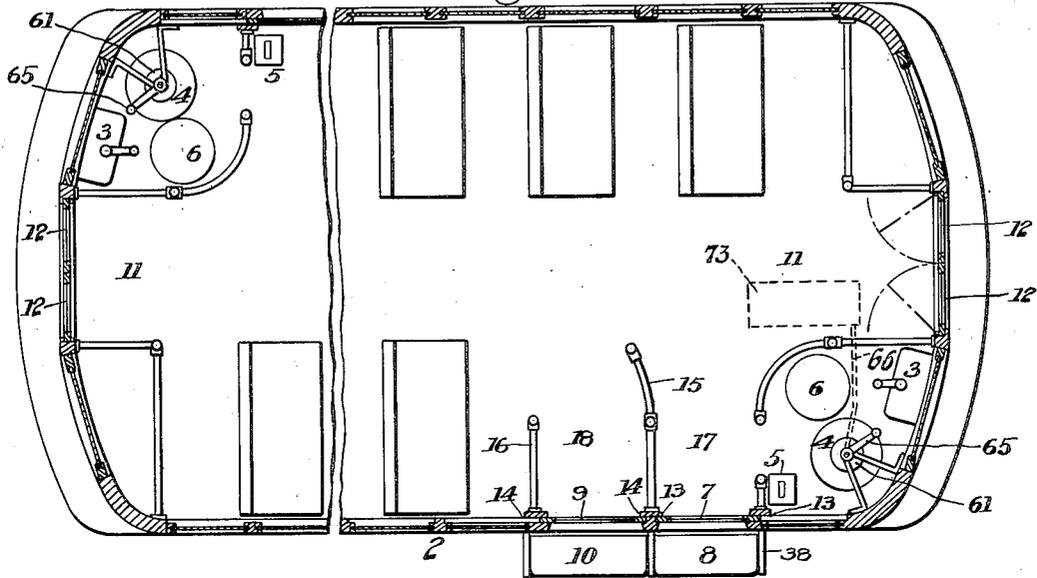


Fig. 2.

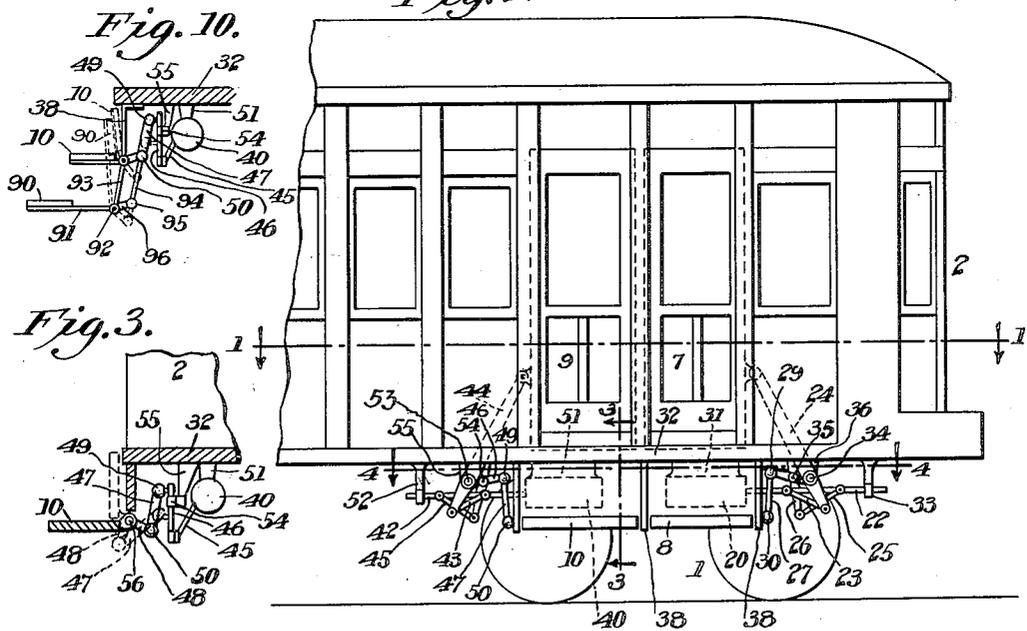


Fig. 3.

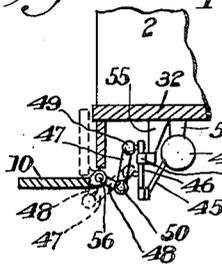
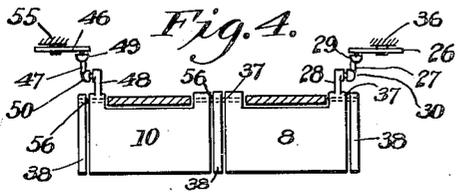


Fig. 4.



INVENTOR:

Ray A. Clapp,

BY

Robt. W. Pearson

ATTORNEY.

UNITED STATES PATENT OFFICE.

RAY A. CLAPP, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROBERT D. PEARSON.

COMBINATION RAILWAY CAR.

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To all whom it may concern:

Be it known that I, RAY A. CLAPP, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Combination Railway Cars, of which the following is a specification.

This invention relates to railway cars and more particularly to one-man operated cars.

One of the objects of the invention is to provide a one-man operated car which may be operated singly, or as a train when connected to other cars.

Another object is to provide a one-man operated car in which the operator is located in the front right hand corner, and the entrance and exit doors located at the rear of the operator so that the operator may always see the door steps, thus avoiding step accidents which are common in the present type of one-man cars.

Another object is to provide a one-man operated car with double, or entrance and exit doors, whereby the car may be rapidly loaded or unloaded, and door accidents avoided.

A further object is to provide a one-man operated car with an entrance and an exit door, and with a door operating apparatus actuated by a single handle for opening or closing either door independently, or for opening or closing both doors together.

With the foregoing and other objects in view the invention consists in the features of construction, combination of elements and arrangement of parts hereinafter described and pointed out in the claims.

Referring to the drawings which form a part of this specification:

Figure 1 is a fragmentary horizontal section of a one-man-operated car embodying my invention taken substantially on line 1—1 of Figure 2.

Figure 2 is a fragmentary side elevation of the car as shown in Figure 1.

Figure 3 is a cross sectional view of a portion of the step operating apparatus taken on line 3—3 of Figure 2.

Figure 4 is a horizontal sectional view of the step operating apparatus taken on line 4—4 of Figure 2.

Figure 5 is a side elevation of the door and step operating apparatus.

Figures 6, 7 and 8 are horizontal sections of the door and step controller taken on line 6—6 of Figure 5, showing the controller in positions respectively for opening the entrance door, for opening both the entrance and exit door and for closing both of said doors.

Figure 9 is a vertical section on line 9—9 of Figure 8.

Figure 10 is a view similar to Figure 3 of a modified form of step and operating apparatus for high cars.

In the drawings 1 indicates the truck and 2 the body of a passenger car mounted on said truck. In the front right hand corner of the car body are located a power controller 3, a door and step controller 4, a fare box 5 and an operator's seat 6. In the rear left hand corner of the car body, which becomes the front right hand corner when the car travels in a reverse direction the parts 3, 4, 5 and 6 are duplicated. At the rear of each fare box 5 and seat 6 are located an entrance door 7 and step 8 and an exit door 9 and step 10. The location of the parts 3, 4, 5 and 6 in said corners provides for a continuous aisle 11 through the car, there being doors 12 in the ends of the car at the ends of said aisle, whereby communication may be established between the ends of the car and the ends of other cars constructed with continuous aisles and end doors, should the car be coupled to said other cars, thus providing a one-man-operated car which may be operated singly or to pull a train.

The entrance door 7 is mounted to slide forwardly into open position in the guides 13 inside the side walls of the car body while the exit door 9 is mounted to slide rearwardly into open position in the guides 14 inside said side walls. A dividing rail 15 extends within the car body from a point between the doors 7 and 9 and a rail 16 extends inwardly from the rear edge of the exit door 9 whereby an entrance 17 and an exit 18 are provided in the car body, leading from door 7 and to door 9 respectively.

The operating mechanism for the entrance door 7 and step 8 comprises an air cylinder 20, a piston 21 in said cylinder, a piston rod 22, a link 23 connected at one end to said piston rod, a lever 24 connected at one end to the other end of said link and at its other end loosely connected to the forward edge

of said door, a link 25 is connected at one end to the piston rod 22, a bell crank 26 is connected at one end to the other end of the link 25, a link 27 is connected at one end to the other end of said bell crank and at its other end to an arm 28 projecting rearwardly from the entrance step 8. The ends of the link 22 are connected to the bell crank 26 and step arm 28 by the universal joints 29 and 30 respectively. The cylinder 20 is suspended on a bracket 31 from the floor 32 of the car body 2. The forward end of the piston rod 22 is slidable in a bearing 33 suspended from the floor 32. The lever 24 and the bell crank 26 are pivoted at 34 and 35 on a bracket 36 depending from the car floor. The door step 8 is pivotally mounted at 37 on the brackets 38 depending from the car floor.

The operating mechanism for the exit door 9 and step 10 comprises an air cylinder 40, a piston 41 in said cylinder, a piston rod 42, a link 43 connected at one end to said piston rod, a lever 44 connected at one end to the other end of said link and at its other end loosely connected to the rear edge of the exit door 9, a link 45 connected at one end to the piston rod 42, a bell crank lever 46 connected at one end to the other end of the link 45, a link 47 connected at one end to the other end of said bell crank and at its other end to an arm 48 projecting rearwardly from the exit step 10. The ends of the link 47 are connected to the bell crank 46 and to the step arm 48 by universal joints 49 and 50 respectively. The cylinder 40 is suspended from the car floor 32 on a bracket 51. The rear end of the piston rod 42 is slidably mounted in a bearing 52 suspended from the car floor. The lever 44 and the bell crank 46 are pivoted at 53 and 54 respectively on a bracket 55 depending from the car floor. The exit door step 10 is pivoted at 56 on the brackets 38 depending from the car floor.

The door controller 4 comprises a pedestal 60 mounted on the floor of the car and a rotary valve 61 is pivotally mounted on top of said pedestal by means of a journal 62 and bearing 63. said journal upstanding from the top of the valve and said bearing being formed on the end of an arm 64 which extends upwardly from the top of the pedestal outside the valve and over the top of the valve. The valve is operated by a single handle 65 secured to the upper end of the journal 62 above the bearing 63. A plurality of pipes 66, 67, 68, 69, 70, 71 and 72 extend upwardly through the pedestal. The pipe 66 is an air service pipe and extends from an air tank 73 upwardly through the center of the pedestal, said tank being secured to the underside of the car body and contains air under pressure which is supplied thereto by an air pump not shown.

The pipe 67 connects to one end of the cylinder 20, and the pipe 68 connects to the other end of said cylinder. The pipes 69 and 70 connect to the ends respectively of the cylinder 40. The pipe 71 connects to the pipe 70, there being a check valve 74 in the pipe 71 to prevent air entering the pipe from the pipe 70 but which allows air to pass from pipe 71 into the pipe 70. The pipe 72 connects to the pipe 69, there being a check valve 75 in the pipe 72 to prevent air from entering said pipe from the pipe 69, but which allows air to pass from pipe 72 into the pipe 69. A pipe 76 connects the pipes 67 and 71 and a check valve 77 is located in the pipe 76 to prevent air passing there-through from pipe 67 into pipe 71, but to allow air to pass from pipe 71 to pipe 67 through pipe 76. A pipe 78 connects the pipes 68 and 72, there being a check valve 79 in the pipe 78 to prevent air passing through said pipe from pipe 68 to pipe 72 but to allow air to pass through the pipe 78 from pipe 72 to pipe 68. The valve 61 is provided with a radial port 80 and with an arcuate port 81 which open through the lower side of the valve and the port 81 is provided with an outlet 82 leading into the atmosphere. Local webs 83 and 84 integral with the valve 61 extend across the lower side of the port 81 flush with the lower face of the valve. On the handle 65 is formed a depending arm 85 in the lower end of which is mounted a spring latch 86 for engaging notches 87 in the upper end of the pedestal 60 to hold the valve 61 in position with the outer end of its port 80 in register with the upper end of either pipe 67, 68, 69, 70, 71 or 72, the inner end of the port 80 at all times connecting with the upper end of the air service pipe 66.

In Figure 10 I have illustrated a modified form of step and operating apparatus suitable for high cars, or cars which require more than one step, it being understood that this other step will be applied at both the entrance and exit. In this form of my invention I provide an additional step 90 below and outwardly of the step 10, which step 90 is carried on the outward ends of the levers 91, pivoted at 92 to the lower ends of the arms 93 depending from the lower ends of the brackets 38. The link 47 is formed with a depending arm 94 which is connected by a ball joint 95 to an arm 96 extending rearwardly from one of the levers 91.

By means of the link 94, arm 96 and levers 91, the step 90 will be let down and folded up with the step 10, the step 90 folding against the step 10.

When the port 80 communicates with the pipe 67 the pipes 68 to 72 communicate with the port 81. Air under pressure passes from pipe 66 through port 80, through pipe 67 into the forward end of the cylinder 20 and forces the piston 21 and

rod 22 rearwardly, whereupon the entrance door 7 is opened through the medium of the link 23 and lever 24 and the step 8 is lowered through the medium of link 25, bell crank 26, link 27 and arm 28. At the same time air is forced by the piston 21 out of the rear end of the cylinder 20 through the pipe 68, port 81 and outlet 82 into the atmosphere. The check valve 77 prevents any air from passing from pipe 67 through pipes 76 and 71 and out through the valve 61 and check valve 79 prevents air from passing through pipes 78 and 72.

To close the door 7 and raise the step 8 the valve is turned until the port 80 registers with pipe 68. Compressed air passes from the pipe 66 through port 80 and pipe 68 into the rear end of the cylinder 20 and forces the piston 21 and rod 22 forwardly, whereupon the door is closed through link 23 and lever 24 and the step 8 is raised through link 25, bell crank 26, link 27 and arm 28. Air is prevented from passing from the pipe 68 into pipes 69 and 72 and out through the valve by the check valve 79. Air in the forward end of the cylinder 20 passes out through the pipe 67, valve port 81 and outlet 82 into the atmosphere.

To open the door 9 and lower step 10 the valve 61 is turned so that port 80 registers with the pipe 70. Compressed air passes from pipe 66 through port 80 and pipe 70 into the rearward end of the cylinder 40 and forces the piston 41 and rod 42 forwardly, whereupon the door is opened through the link 43 and lever 44 and the step 10 is lowered through link 45, bell crank 46, link 47 and arm 48. Air is prevented from passing from the pipe 70 out through the pipe 71 into the atmosphere by the check valve 74. Air passes out of the rear end of the cylinder through pipe 69, valve port 81 and outlet 82 into the atmosphere.

To close the door 9 and to raise step 10 the valve is turned until the port 80 registers with pipe 69. Compressed air passes from pipe 66 through port 80 and pipe 69 into the forward end of the cylinder 40 and forces the piston 41 and rod 42 rearwardly, whereupon the door 9 is closed through link 43 and lever 44, and the step 10 is raised through link 45, bell crank 46, link 47 and arm 48. Air is prevented from passing from pipe 69 into pipe 72 and out through valve 61 by the check valve 75. Air passes out of the forward end of the cylinder through pipe 70, valve port 81 and outlet 82 into the atmosphere.

To open both doors and lower both steps the valve is turned so that the port 80 registers with the pipe 71 and the webs 83 and 84 cover the upper ends of the pipes 67 and 70 respectively. Compressed air passes from pipe 66 through port 80, pipe 71, pipe

76 and pipe 67 into the forward end of the cylinder 20, and from pipe 71 through pipe 70 into the rear end of the cylinder 40, whereupon the piston 21 and rod 22 are forced rearwardly and the piston 41 and rod 42 are forced forwardly, and the doors 7 and 9 are both opened and the steps 8 and 10 are lowered through the parts and in the manner above described. Air cannot pass out of the pipes 67 and 70 because they are closed by the valve webs 83 and 84 respectively, and air cannot escape through the pipes 76 and 71 into the atmosphere because of check valves 77 and 74. Air passes out of the rear end of the cylinder 20 through pipe 68, and valve port 81 and outlet 82, and air passes out of the forward end of the cylinder 40 through pipe 69, valve port 81 and outlet 82.

To close both doors and raise both steps the valve is turned so that the port 80 registers with port 72 and webs 83 and 84 close the upper ends of the pipes 68 and 69 respectively. Compressed air passes from pipe 66 through port 80, pipe 72, pipe 78 and pipe 68 into the rear end of the cylinder 20, while air also passes from pipe 72 through pipe 69 into the forward end of the cylinder 40, whereupon the piston 21 and rod 22 are forced forwardly and the piston 41 and rod 42 are forced rearwardly and the doors 7 and 9 are closed and the steps 8 and 10 are raised through the medium of the parts above described. Air cannot escape through pipe 72 to the atmosphere because of the check valves 79 and 75. Air cannot pass out through the pipes 68 and 69 because they are closed by the webs 83 and 84 respectively. Air passes out of the forward end of the cylinder 20 through pipe 67, port 81 and outlet 82. Air passes out of the rear end of the cylinder 40 through the pipe 70 and valve port 81 and outlet 82.

Having thus described my invention what I claim is:

1. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, a door in the car body at the rear of said control station, and door operating apparatus controlled by said door controlling means for opening and closing said door.

2. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, an entrance door and an exit door in the car body at the rear of said control station, and door operating apparatus controlled by said door controlling means for opening and closing said doors.

3. In a one-man-operated car, a car body, a control station comprising a power con-

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trolling means and door controlling means located in the front right hand corner of said body, an entrance door and an exit door in the car body at the rear of said control station, and door operating apparatus controlled by said door controlling means for opening and closing said doors together or independently of each other.

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4. In a one-man-operated car, a car body, a control station comprising a power controlling means and door and step controlling means located in the front right corner of said body, an entrance door and step and exit door and step on said car body at the rear of said control station, and door and step operating apparatus controlled by said door and step controlling means for opening or closing said doors and lowering or raising said door steps together or independently of each other.

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5. In a one-man-operated car, a car body, a control station comprising a power controlling means and door and step controlling means located in the front right corner of the car body, a sliding door and swinging step on the car body at the rear of said control station, a cylinder and piston, said door and step controlling means controlling the admission of air into said cylinder and the escape of air therefrom, a rod connected to said piston, a lever connected at one end to said door, a link connected to the other end of said lever and to said piston rod, a bell crank, a link connecting said piston rod and one end of said bell crank, and a link connecting the other end of said bell crank and said step.

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6. In a one-man-operated car, a car body, a control station comprising a power controlling means and door and step controlling means located in the front right corner of the car body, a sliding door and swinging step on the car body at the rear of said control station, a cylinder and piston, said door and step controlling means controlling the admission of air into said cylinder and the escape of air therefrom, a rod connected to said piston, a lever connected at one end to said door, a link connected to the other end of said lever and to said piston rod, a bell crank, a link connecting said piston rod and one end of said bell crank, and a link universally connected to the other end of said bell crank and to said step.

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7. In a one-man-operated car, a car body, a control station comprising a power controlling means and door and step controlling means located in the front right corner of the car body, a door and step on the car body at the rear of said control station, and apparatus controlled by said door and step controlling means for opening or closing

said door and for lowering or raising said step.

8. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, there being an aisle extending from end to end through the car, a door in the car body at the rear of said power controlling means, and door operating apparatus controlled by said door controlling means for opening and closing said door.

9. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, there being an aisle extending from end to end through the car body, and doors in the end walls of the car body at the ends of said aisles, a door in the car body at the rear of said power controlling means, and door operating apparatus controlled by said door controlling means for opening and closing said door.

10. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, an entrance door and an exit door in the car body at the rear of said control station, and door operating apparatus controlled by said door controlling means for opening and closing said doors, and a single handle for actuating said door controlling means.

11. In a one-man-operated car, a car body, a control station comprising a power controlling means and door controlling means located in the front right hand corner of said body, an entrance door and an exit door in the car body at the rear of said control station, and door operating apparatus controlled by said door controlling means for opening and closing said doors together or independently of each other, and a single handle for actuating said door controlling means.

12. In a one-man-operated car, a car body, a control station comprising a power controlling means and door and step controlling means located in the front right corner of said body, an entrance door and step and exit door and step on said car body at the rear of said control station, and door and step operating apparatus controlled by said door and step controlling means for opening or closing said doors and lowering or raising said door steps together or independently of each other, and a single handle for actuating said door and step controlling means.

In testimony whereof I affix my signature.
RAY A. CLAPP.