W. V. TURNER.
CAR DOOR MOTOR.
APPLICATION FILED AUG. 4, 1916.

1,326,228.

Patented Dec. 30, 1919.

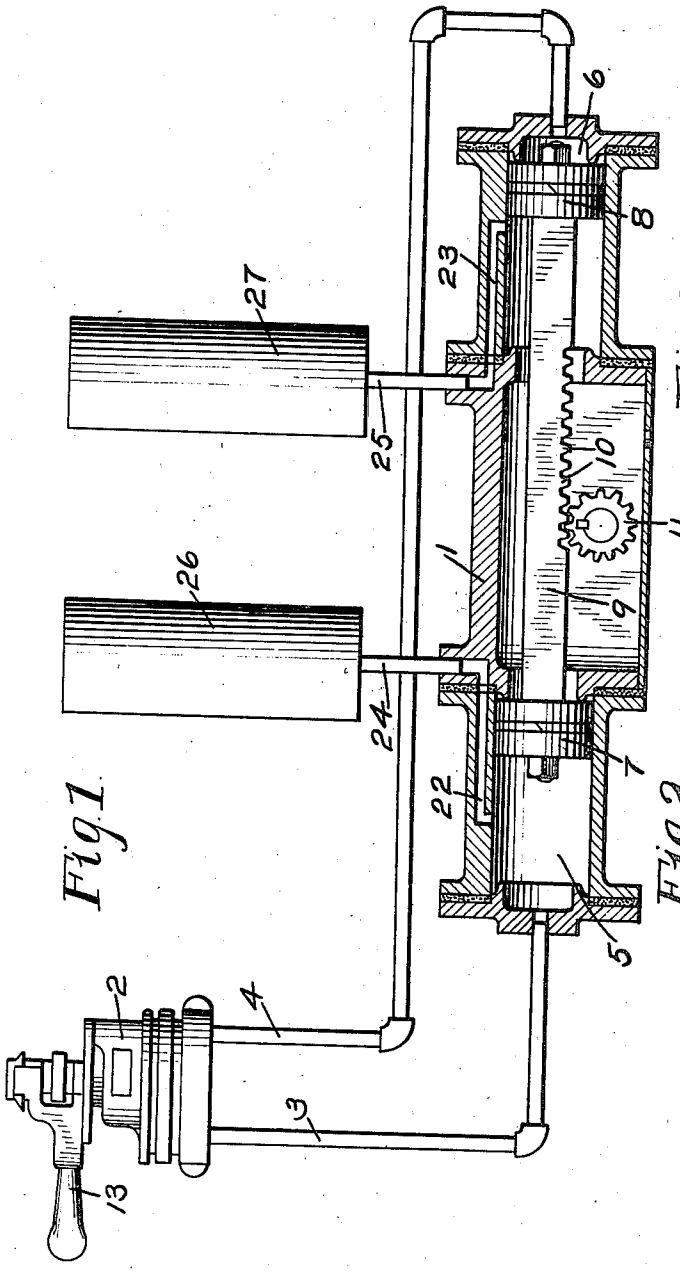


Fig. 1.

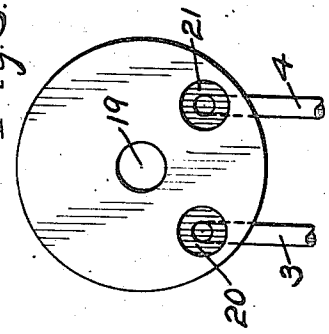


Fig. 3.

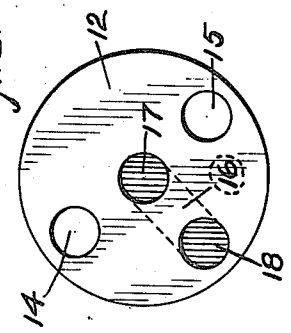


Fig. 2.

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WALTER V. TURNER, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF WILMERDING, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CAR-DOOR MOTOR.

1,326,228. Specification of Letters Patent. Patented Dec. 30, 1919.

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To all whom it may concern:

Be it known that I, WALTER V. TURNER, a citizen of the United States, residing at Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Car-Door Motors, of which the following is a specification.

This invention relates to door operating motors, and more particularly as applied for controlling the doors of traction cars.

The principal object of the invention is to provide improved means for cushioning the action of the door motor in order to prevent slamming of the car doors.

In the accompanying drawings; Figure 1 is a diagrammatic view, with the door operating motor in section, of a car door controlling apparatus; Fig. 2 a face view of the rotary valve for controlling the admission and release of fluid under pressure to and from the door operating motor; and Fig. 3 a plan view of the valve seat for said rotary valve.

As shown in the drawing, the door controlling apparatus may comprise a door operating motor 1 and a controlling valve device 2 connected by pipes 3 and 4 to the door motor.

The door motor comprises a casing having piston chambers 5 and 6 connected respectively to pipes 3 and 4 and containing pistons 7 and 8 connected together by a piston rod 9.

The piston rod 9 is provided with rack teeth 10 adapted to be engaged by a pinion 11, which, through suitable mechanism (not shown) is adapted to effect the opening and closing of the car doors when the pinion is rotated by the movement of the piston rod 9.

The controlling valve device 2 contains a rotary valve 12 adapted to be operated by a handle 13 and having through ports 14 and 15 and a cavity 16 having a central port opening 17 and an outer port opening 18. The seat of the rotary valve 12 is provided with a central exhaust port 19 and ports 20 and 21 which communicate respectively with the pipes 3 and 4. Ports 22 and 23 lead to the respective piston chambers 5 and 6 and are connected by the respective pipes 24 and 25 to reservoirs or receptacles 26 and 27, the ports 22 and 23 being so positioned that when the corresponding piston is in its extreme outer position, the port is opened to the chamber at the inner face of the piston.

Assuming that when the pistons 7 and 8 are moved to the right hand position shown in the drawing, the doors are closed, the corresponding position of the valve device 2 will be such that through port 15 registers with port 20 so that fluid is supplied from a suitable source of fluid under pressure through pipe 3 to piston chamber 5 and in the same position cavity 16 connects port 21 with exhaust port 19, so that piston chamber 6 is maintained at atmospheric pressure. The pistons 7 and 8 will therefore be maintained in this position by the fluid pressure in piston chamber 5, thus dispensing with the necessity for employing a locking device to hold the doors in the closed position.

If it is desired to open the doors, the handle 13 is turned so as to bring the through port 14 into registry with port 21 and cavity 18 into position, so that port 20 is connected to exhaust port 19.

Fluid is then supplied to piston chamber 6 and the pistons are shifted to the left.

When piston 8 passes over the port 23, fluid is also supplied to reservoir 27 and this reduces the pressure and the rate of increase in pressure in piston chamber 6, so that the movement of the piston is retarded and a slower action of the doors is obtained, so that slamming of the doors is prevented.

The volume of the reservoir may be so proportioned with respect to the volume of the piston chamber that any desired rate of movement can be secured, as will be evident.

As the piston 7 approaches its outer seat, the port 22 is passed over by the piston, so that the port is opened to the chamber at the inner face of the piston, permitting the fluid remaining in the reservoir 26 to exhaust to the atmosphere, since the inner chamber is open to the atmosphere.

If it is desired to close the doors, the handle 13 is turned to the position for admitting fluid under pressure to the piston chamber 5 and for venting fluid from piston chamber 6.

In this case, the movement of the pistons is also retarded by the flow of fluid into reservoir 26 which is connected to piston chamber 6.

It will now be seen that the cushioning of the pistons is brought about without the use

of check valves or other auxiliary valves, so that a simple construction is provided which can be cheaply manufactured, and which is not liable to get out of order.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A fluid operated motor comprising a casing having a piston chamber, a piston therein, having one side constantly open to the atmosphere, and a closed reservoir connected to said piston chamber and communicating in the release position of the piston with the atmospheric side of the piston and with the fluid pressure side of the piston upon a partial movement of the piston by fluid under pressure.

2. A fluid operated motor comprising a casing having opposite piston chambers, a piston in each chamber having one side constantly open to the atmosphere and the opposite side adapted to be subjected to fluid pressure, a member connecting said pistons, and a separate closed reservoir connected to each piston chamber and communicating with the fluid pressure side of the corresponding piston upon movement of said piston by fluid under pressure.

3. A door operating motor comprising a casing having piston chambers containing pistons connected together for operating the car doors and having one side of each piston open to the atmosphere, means for supplying and releasing fluid to the other side of each piston, and a separate reservoir of constant volume connected to each piston chamber and opening to the atmospheric side of the piston in its release position and adapted to be charged with fluid supplied to the piston chamber upon a predetermined movement of the piston.

4. A door operating motor comprising a casing having piston chambers containing pistons connected together for operating the car doors and each piston having one side constantly open to the atmosphere, a manually operated valve device having positions for supplying fluid to one piston chamber and for releasing fluid from the other, and a separate reservoir connected to each piston chamber and communicating with the fluid pressure side of the corresponding piston upon movement of said piston by fluid under pressure.

5. A door operating motor comprising a casing having a piston chamber, a piston therein for operating the door having one side constantly open to the atmosphere, and a reservoir normally at atmospheric pressure connected to said piston chamber and communicating with the fluid pressure side of the piston upon movement of the piston by fluid pressure.

In testimony whereof I have hereunto set my hand.

WALTER V. TURNER.