H. ROWNTREE.

HINGED DOORS AND OPERATING MECHANISM THEREFOR.

APPLICATION FILED APR. 3, 1909.

1,088,936.

Patented Mar. 3, 1914.

2 SHEETS—SHEET 1.

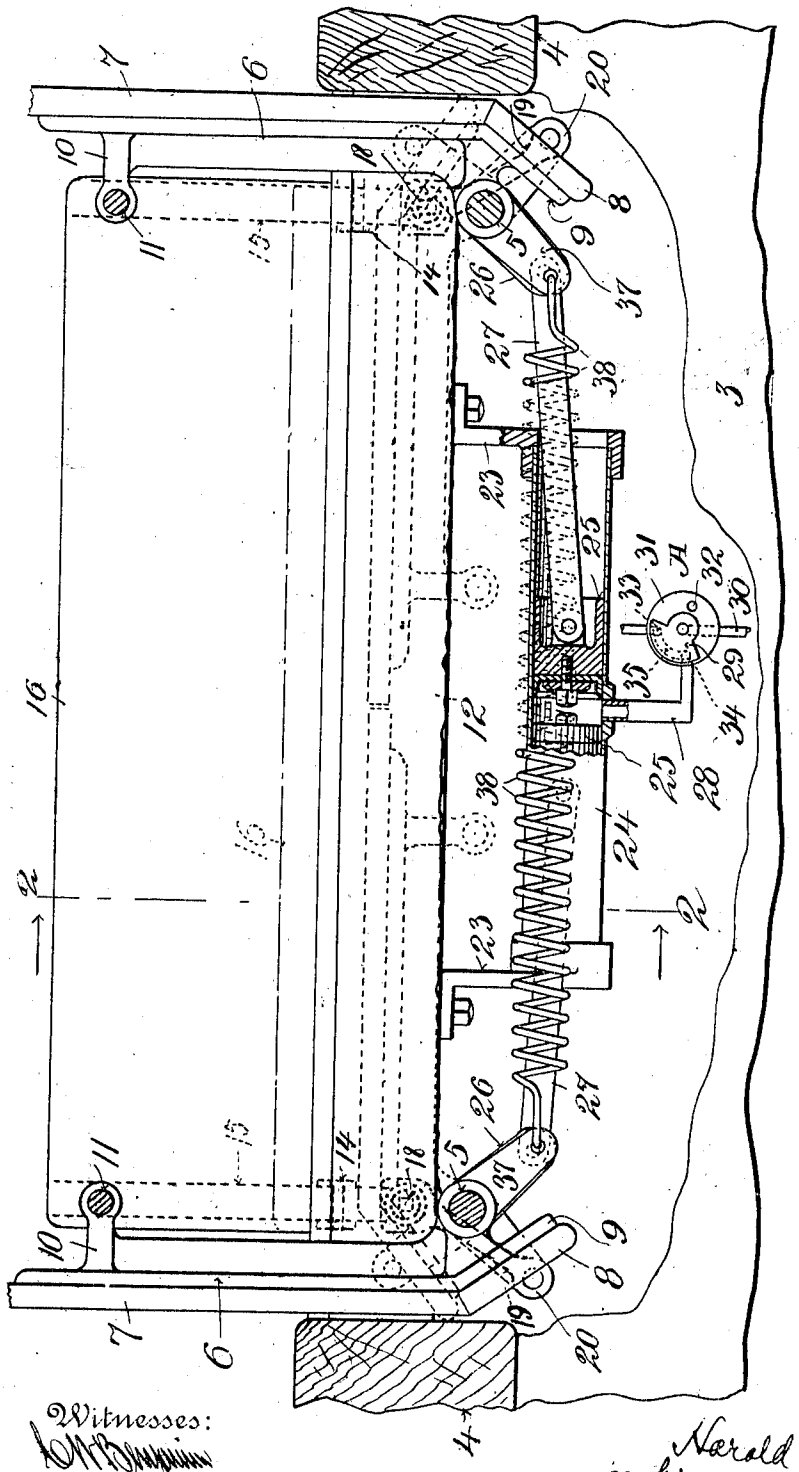


Fig. 1.

Witnesses:

Inventor

Harold Rowntree

By his Attorney

Samuel E. Darby

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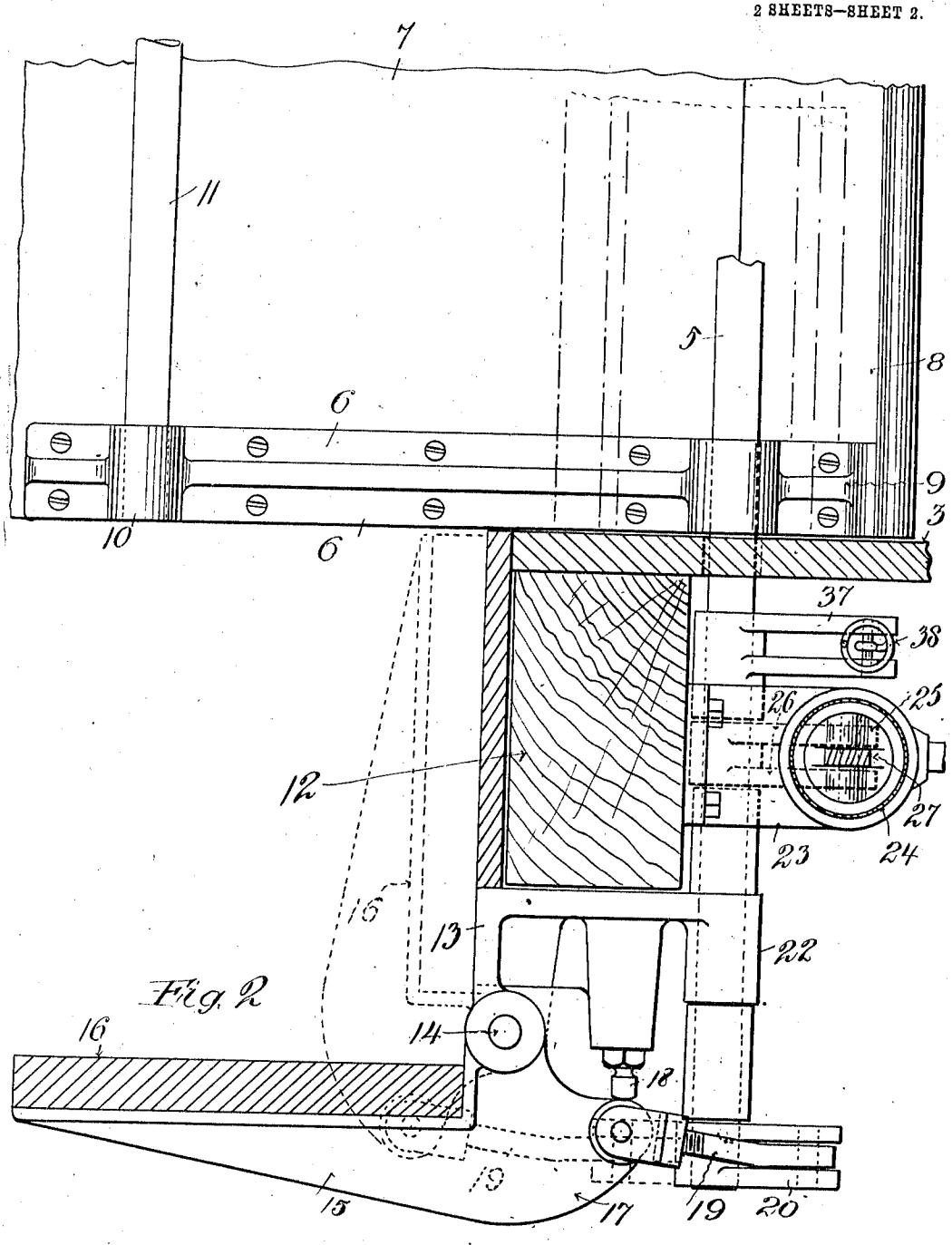


Fig. 2

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UNITED STATES PATENT OFFICE.

HAROLD ROWNTREE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO NATIONAL PNEUMATIC COMPANY, A CORPORATION OF WEST VIRGINIA.

HINGED DOORS AND OPERATING MECHANISM THEREFOR.

1,088,936. Specification of Letters Patent. Patented Mar. 3, 1914.

Application filed April 3, 1909. Serial No. 487,667.

To all whom it may concern:

Be it known that I, HAROLD ROWNTREE, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have made a certain new and useful Invention in Hinged Doors and Operating Mechanism Therefor, of which the following is a specification.

This invention relates to hinged doors, and particularly to double hinged doors, and power operated actuating mechanism therefor.

The object of the invention is to provide a construction of double hinged doors and operating mechanism therefor which is simple and efficient.

Other objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings and finally pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a view in top plan of a construction of door and associated step and operating mechanism therefor, embodying the principles of my invention, parts in horizontal section. Fig. 2 is a view in vertical section on the line 2, 2, Fig. 1.

The same part is designated by the same reference sign wherever it occurs.

In the drawing reference sign 3 designates the floor of a car, 4 are jambs, posts or other parts arranged to form a doorway space, or entry between them. At the sides of this doorway and adjacent the jambs or posts 4, are vertically extending shafts 5, suitably journaled to rock in bearings provided therefor. Castings 6, are carried by the shafts 5, to rock or swing therewith. The doors 7 are secured to the castings 6, and supported thereby. The shafts 5, are somewhat removed from the adjacent jambs or posts 4, so that the doors, when open, will lie close against the faces of the jambs. In order to close the space between the shafts and their adjacent jambs when the doors are closed; each door is provided on the edge thereof which is closest to the jamb, with an auxiliary narrow panel 8, which, as indicated in dotted lines in Fig. 1, forms a closure for the space referred to when the door is closed. The narrow panels 8 are carried by the extensions 9, of the castings 6. The castings, at or adjacent their outer or free ends are provided with extensions 10, in which are carried vertical rods 11, designed to form hand grabs to aid passengers entering or leaving the car, where my invention is applied to street cars, to ascend to or descend from the floor of the car. The vertical rock shafts 5 may also serve the same purpose.

To the underside of the floor supporting beam 12, or other suitable or convenient part, is secured a casting 13, which may be arranged to form one of the bearings 22, in which the shaft 5 is journaled. Upon a pivot pin 14, carried by said castings 13, is pivotally mounted a bracket 15, arranged to form a support for a step 16. Of course it will be understood that a similar support is provided, if desired, at each end of the step so as to afford an efficient and substantial support therefor. Each bracket 15 is provided with an extension 17, beyond the axis of its supporting pivot pin 14, and which extension coöperates with an adjustable stop or limit pin 18, mounted in the casting 13, to form an abutment for the step when in position for use, as clearly shown in Fig. 2. Pivotally connected at one end to the extension 17, of each bracket 15, is a link 19, the other end of said link being pivotally connected to a crank arm 20, mounted on the adjacent shaft 5, whereby, when the shaft is rocked to open or close the door the step is coöperatingly moved into or out of position for use as the case may be. Since a casting 15, is provided for each end of the step, and each casting is connected to its adjacent shaft 5, it follows that the associated doors, shafts and step must all move in unison.

Suitably supported by brackets 23, or otherwise, mounted on the inner face of the beam 12, or other convenient part, is a power cylinder 24. This cylinder is open at both ends and has two oppositely faced pistons 25, therein. The shafts 5, are provided with crank arms 26, which are respectively connected by links 27, or otherwise, to the pistons 25, whereby when said pistons are moved the shafts 5 are rocked. The pis-

ton rods or links 27, extend through the open ends of the cylinder for connection to the pistons. A valve device, indicated generally by reference sign A, Fig. 1, controls the supply and exhaust of operating medium to and from the cylinder. In the form shown a pressure supply connection 28, extends from the valve or control device A, to a point midway the length of the cylinder 24, and between the pistons 25. The valve or control device comprises a valve 29, having an operating handle 30, and is adapted to operate over a seat surface 31, having the pressure supply port 32, the exhaust port 33, and the cylinder supply connection port 34. The under face of the valve 29 is provided with a channel or recess indicated in dotted lines at 35, whereby the ports 33, and 34, may be brought into communication with each other whenever desired. This control device is represented somewhat diagrammatically as the structure thereof in its details forms no part of the present invention, and hence any suitable or convenient form of control device may be employed.

Where the control device is manipulated so as to admit pressure medium to the cylinder 24, at a point between the pistons 25, said pistons are forced apart thereby coincidently rocking the shafts 5, and hence swinging the doors closed, the doors being held in their closed positions by the force of the pressure medium and when the pressure medium is opened to exhaust from the cylinder the doors are free to move to open position. In order to insure the movement of the doors to open position when the pressure is exhausted from the cylinder 24, I provide each shaft 5, with a crank arm 37, arranged to project in opposite directions, and I connect these crank arms by means of a strong spiral or other spring 38, the tension of which is constantly exerted in a direction to hold the doors open. The operation of the doors to their closed position by the pressure medium acting on the pistons 25, is against the tension of spring 38. Coincidently with the movements of the doors the actuation of the step 16 is also accomplished through the connections above described.

A door and operating mechanism therefor, such as above described is simple, inexpensive, cheap and substantial, and can be easily and quickly installed. It is obvious that the control device A, may be located at any convenient point.

By reason of the fact that the pressure medium holds the doors in their closed position it will be observed that I avoid the necessity of providing positive locking mechanism for the doors when in this position. This is a desirable feature in street, subway or elevated car constructions for the reason that while the doors are held closed with sufficient degree of pressure to prevent the same from being opened by passengers leaning thereagainst, still, by applying concentrated force the doors may be opened in case of panic, accident or other cause, or in case the conductor should be forced to leave his station, thereby enabling the passengers to release themselves.

I do not claim herein the combination which includes the door and step with connections for securing coincident movements of the door and step, as the same is claimed in a separate application.

It will also be seen that in a construction of door operating mechanism such as above described means for cushioning the door movements are not required.

Having now set forth the object and nature of my invention, and a construction embodying the principles thereof, and having described such construction, its purpose, function and mode of operation, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent is:—

1. The combination with door jambs arranged on opposite sides of a doorway, a vertical shaft journaled adjacent each jamb, a door connected to each shaft, a crank arm on each shaft, a piston connected to each crank arm, a cylinder in which said pistons move in opposite directions, and means for controlling the supply and exhaust of operating medium from the space between said pistons.

2. The combination with jambs arranged on opposite sides of a doorway, a vertical shaft journaled adjacent each jamb, a door connected to each shaft, a crank arm on each shaft, a spring connecting said crank arms, independent pistons respectively connected to said shafts for rocking the same, a cylinder in which both pistons operate and means for simultaneously actuating said pistons against the tension of said spring.

3. The combination with jambs arranged on opposite sides of a doorway, a vertical shaft journaled adjacent each jamb, a door connected to each shaft, a crank arm on each shaft, independent pistons respectively connected to said arms, a cylinder in which both pistons operate, means for simultaneously actuating said pistons in opposite directions, to open the doors, and a spring having operative connection with both shafts to close the doors.

4. The combination with vertical shafts respectively arranged on opposite sides of a doorway, a door connected to each shaft, a crank arm on each shaft, a piston connected to each crank arm, a cylinder in which said pistons move in opposite direction, means for controlling the

supply and exhaust of operating medium to and from said cylinder in the space between said pistons, and a spring having connection with both of said shafts to yieldingly oppose the action of said pistons when the latter are actuated.

In testimony whereof I have hereunto set my hand in the presence of the subscribing witnesses, on this 31st day of March A. D., 1909.

HAROLD ROWNTREE.

Witnesses:

LEMUEL M. SHIELDS,

M. H. MARTIN.