R. T. SENTER.

DOOR AND STEP OPERATING MECHANISM.

APPLICATION FILED MAR. 4, 1912. RENEWED MAY 22, 1914.

1,105,707. **Patented Aug. 4, 1914.**

2 SHEETS—SHEET 1.

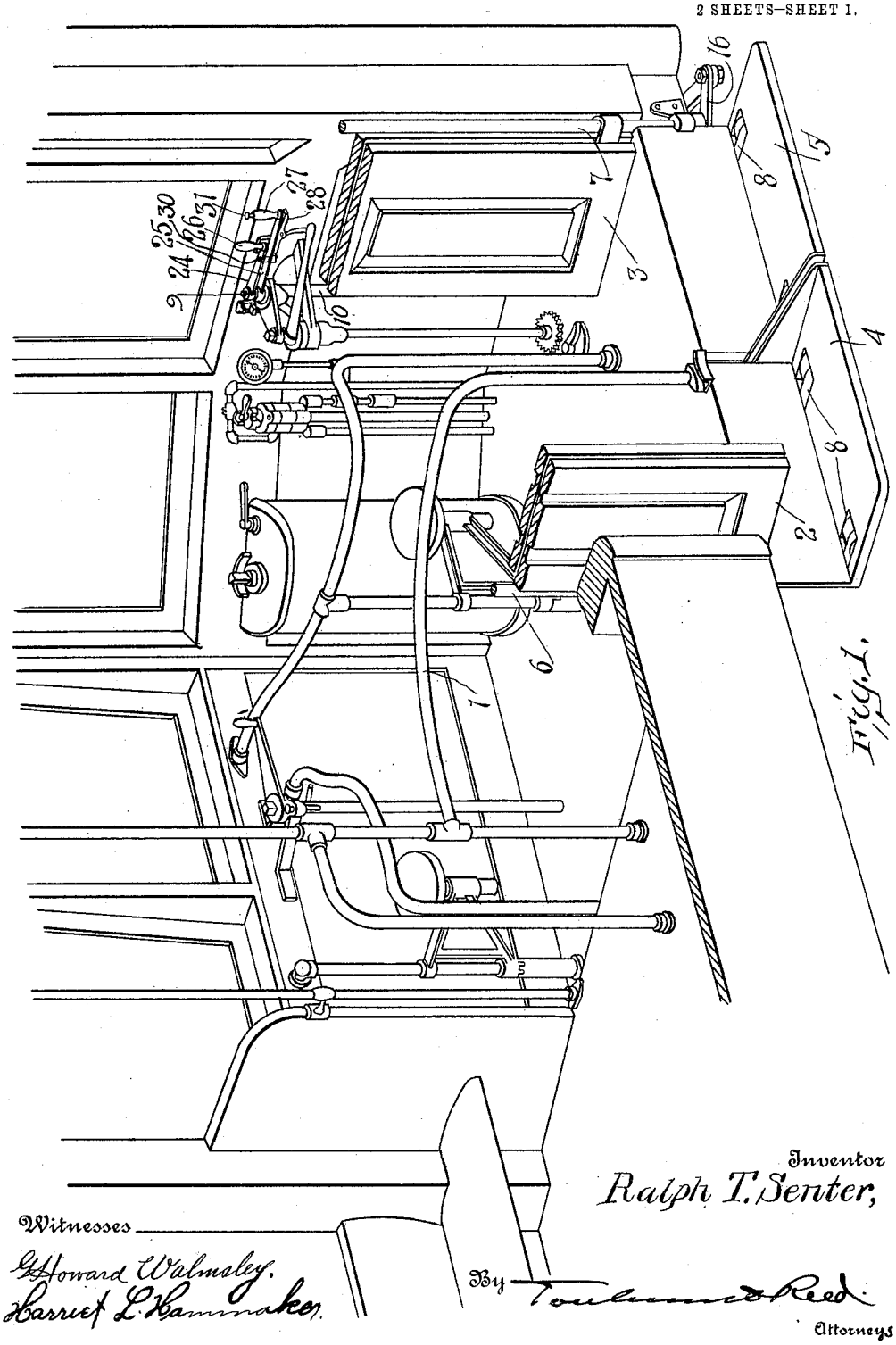


FIG. 1.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

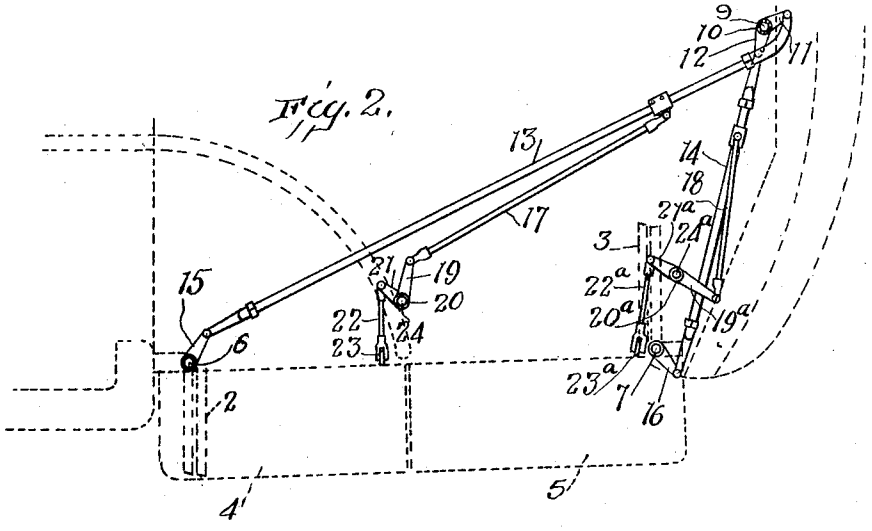


Fig. 3.

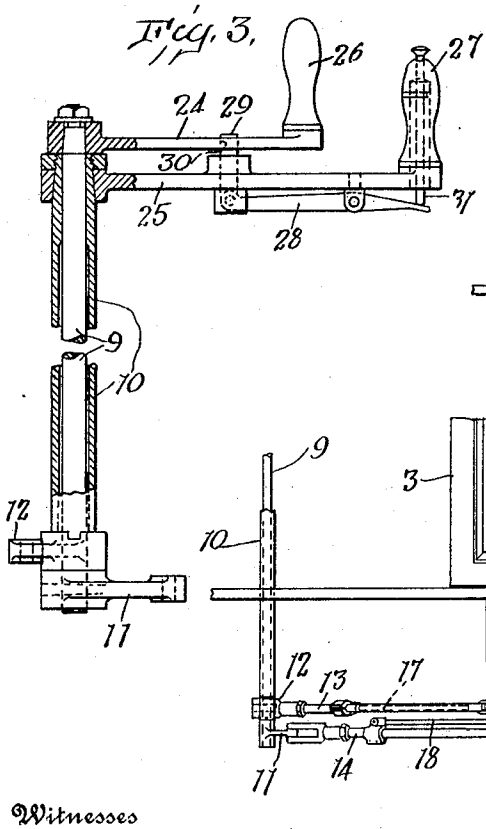


Fig. 4.

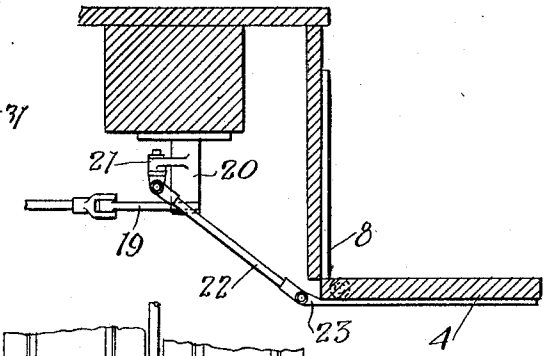


Fig. 5.

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UNITED STATES PATENT OFFICE.

RALPH T. SENTER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NEAR-SIDE CAR COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

DOOR AND STEP OPERATING MECHANISM.

1,105,707. Specification of Letters Patent. Patented Aug. 4, 1914.

Original application filed July 5, 1911, Serial No. 638,635. Divided and this application filed March 4, 1912, Serial No. 681,545. Renewed May 22, 1914. Serial No. 840,364.

To all whom it may concern:

Be it known that I, RALPH T. SENTER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Door and Step Operating Mechanism, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to door and step operating mechanism for street cars and is shown as applied to a car of the type shown and described in the application filed by me July 5, 1911, Serial Number 638,635, of which application this present application is a division.

The object of the invention is to provide a separate movable step for each door and to provide means for actuating each step in unison with the corresponding door; and further, to actuate each door and its step either simultaneously with or separately from the other door and its step.

In the accompanying drawings, Figure 1 is a perspective view of the front platform of a street car equipped with my invention; Fig. 2 is a detail view of the door and step operating mechanism showing parts of the car in dotted lines; Fig. 3 is a detail view, partly in section, of the operating devices; and Fig. 4 is a sectional view showing a portion of the step operating mechanism; and Fig. 5 is a side elevation of the door and step operating mechanisms.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a street car having its forward portion or front platform divided by a rail or barrier, 1, to form ingress and egress passageways arranged side by side and extending from the body or passenger section of the car to one side of the platform. Each passageway is controlled by a door, 2 and 3, and is provided with a step, 4 and 5. In the present instance the doors are located at the edge of the platform adjacent to the steps and means are provided for opening and closing said doors either individually or simultaneously; and further, means are provided for operating each step in unison with its door, whereby when the door is open the step will be down in position for use and when the door is in its closed position the step will be folded up against the edge of the platform. In the present instance each door comprises two sections hinged together at their adjacent edges. One section of each door is rigidly secured at its edge to a door supporting rod, as indicated at 6 and 7, and the other section of each door is connected at its outer edge with a guide by means of which it is caused to move toward and away from the supporting rod to which the other section of the same door is connected, thus causing the outer section of the door to fold upon that section thereof which is connected to the rod when the latter section is moved into its open position. Such guides are well known in the art and need not be here shown or described. Each step is pivotally mounted at its inner edge upon brackets 8, whereby it can be moved into a horizontal or a vertical position.

Suitable operating devices are provided for moving the doors into their open or closed positions at the will of the officer in charge and these operating devices are so connected with the steps as to cause the latter to move in unison with their respective doors. In the present form of the mechanism the operating devices comprise two vertical shafts 9 and 10 having suitable connections with the respective doors and steps. Preferably the shafts 9 and 10 are telescopically arranged and are provided at their lower ends with crank arms 11 and 12 which are connected by means of connecting rods 13 and 14 with crank arms 15 and 16 rigidly secured to the lower ends of the respective door supporting rods 6 and 7. Obviously, by manipulating the shafts 9 and 10 motion will be imparted to the doors. Suitable connections are established between the shafts and respective steps to cause this same manipulation of the shafts to operate the steps as well as the doors. This connection may be of any suitable character but, as here shown, comprises rods 17 and 18 connected to and movable with the rods 13 and 14, respectively, and also connected with the corresponding steps. The rods 17 and 18 are connected to rock arms 19 and 19^a rigidly secured to sleeves 20 and 20^a mounted on stud shafts 24 and 24^a se-

cured to the frame of the car and depending beneath the same and also having secured thereto other crank arms 21 and 21ª connected by short rods 22 and 22ª with inwardly projecting lugs 23 and 23ª rigidly secured to the respective steps, 4 and 5. The lugs 23 and 23ª project inwardly from the axes about which the steps move. Consequently, a downward and outward movement of either lug will cause the outer portion of the corresponding step to swing upward and inward and thereby fold against the side of the car. It will be apparent, therefore, that rotary movement imparted to either of the vertical shafts 9 and 10 will simultaneously impart movement to the door and the step with which it is connected, this movement being such as to open or close the door and lower or raise the step. This movement may be imparted to the operating devices in any suitable manner. In the present instance we have shown the upper end of each shaft as having connected thereto an operating member, such as arms 24 and 25, having handles 26 and 27. These handles are so arranged on their respective shafts that when the doors are both in either their open or closed positions the two arms will lie substantially parallel and one above the other, the arrangement being such that either handle can be readily grasped and the corresponding operating device actuated. Preferably, means are also provided to enable the two operating devices to be actuated in unison, thus simultaneously operating both doors and both steps. To this end the lower arm 25 has pivotally mounted thereon a lever 28 connected at one end to a pin 29 which is slidably mounted in a guideway in the arm and is so arranged that when the two arms are in their parallel positions it will be in alinement with an opening 30 in the upper arm 24. A rod 31 is slidably mounted in the handle 27 of the lower arm and arranged to press upon the adjacent end of the lever 28. Thus, when the officer grasps the handle 27 he can, by the pressure of his thumb upon the rod 31, connect the two arms together and cause the operating devices to move in unison.

With the arrangement of the mechanism herein described the controlling officer, who, in the present instance, is the motorman, can operate either door and its step independently of the other door and its step or he can, by the same movement, simultaneously operate both doors and their corresponding steps.

It will be understood that, while I have shown and described one embodiment of the invention, this form is chosen for the purpose of illustration only and I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

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

1. The combination, with a plurality of doors, and a movable step for each of said doors, of a manually controlled device to operate said doors either separately or in unison, and connections between said steps and the respective operating devices to cause each step to be actuated in unison with the corresponding door.

2. The combination, with a plurality of doors, and a hinged step for each of said doors, of a pair of telescoping shafts, means for actuating each of said shafts, rods connecting the respective shafts with the respective doors, other rods connected at one end with the respective first-mentioned rods and at their other ends with the respective steps, and means for connecting said shafts one with the other to cause them to move in unison.

3. The combination, with a door, a rotary supporting rod, to which said door is secured, a step mounted on a horizontal axis adjacent to said door, and a projection carried by said step and extending beyond said axis, of a shaft, means for imparting rotary movement to said shaft, a crank arm secured to said shaft, a second crank arm secured to said supporting rod, a rod connecting said crank arms one to the other, a rock arm, a rod connecting said rock arm with the projection from said step, and a second rod connecting said rock arm with the first-mentioned connecting rod, whereby the manipulation of said shaft will impart movement to said door and said step.

4. The combination, with a plurality of doors, rotary supporting rods to which the respective doors are connected, a step for each of said doors mounted on a horizontal axis and having a projection extending beyond said axis, of vertical shafts each having a crank arm secured thereto, a crank arm secured to the lower end of each of said supporting rods, rods to connect the crank arms of said shafts with the crank arms of the respective door-supporting rods, rock arms supported adjacent to and operatively connected with the projections from the respective steps, and a rod connecting said rock arms with the respective connecting rods, and means for actuating said shafts either individually or in unison.

5. The combination, with a plurality of doors, and a step mounted adjacent to each door and movable into operative and inoperative positions, of a pair of shafts, connections between said shafts and the respective doors and corresponding steps, whereby the manipulation of one shaft will actuate one door and its step and the manipulation of the other shaft will actuate the other door and its step, and means for connecting said

shafts so they will move in unison to simultaneously actuate both doors and both steps.

6. The combination, with a plurality of doors, and a step mounted adjacent to each door and movable into operative and inoperative positions, of a pair of telescoping shafts, connections between said shafts and the respective doors and corresponding steps, whereby the manipulation of one shaft will actuate one door and its step and the manipulation of the other shaft will actuate the other door and its step, and means for connecting said shafts so they will move in unison to simultaneously actuate both doors and both steps.

In testimony whereof, I affix my signature in presence of two witnesses.

RALPH T. SENTER.

Witnesses:
EDWARD P. RAWLE,
HENRY C. ESLING.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."