

H. H. SCHROYER.
TRAP DOOR.
APPLICATION FILED NOV. 15, 1913.

1,089,367.

Patented Mar. 3, 1914.

2 SHEETS—SHEET 1.

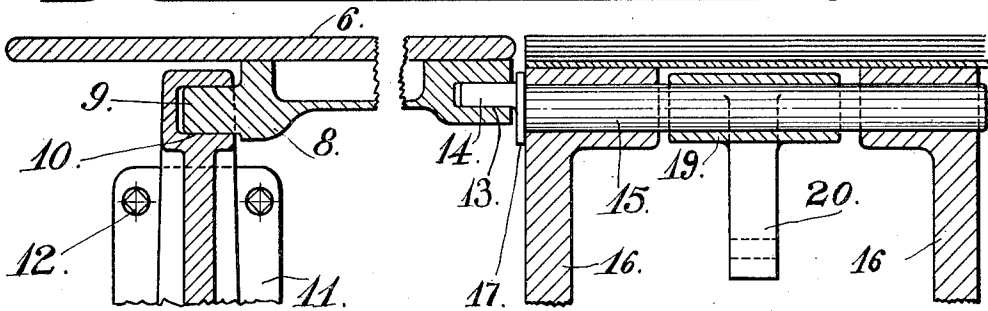
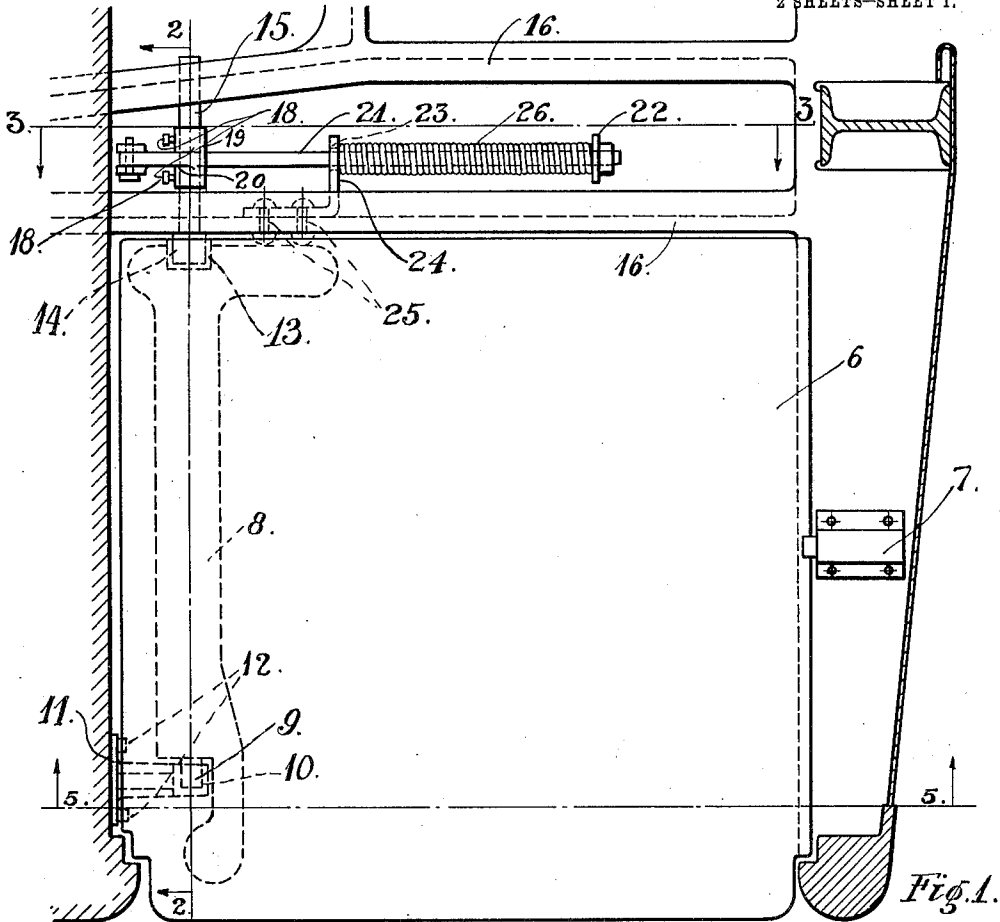


Fig. 2.

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2 SHEETS-SHEET 2.

Fig. 3.

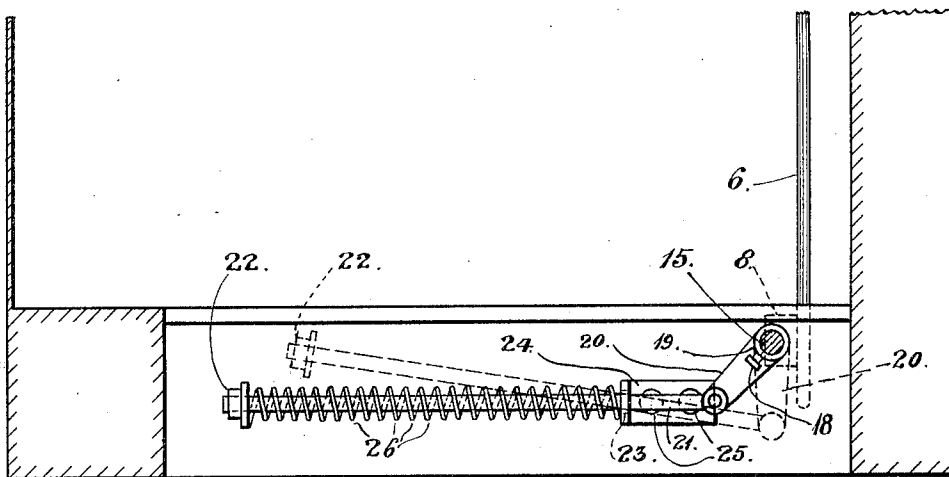


Fig. 4.

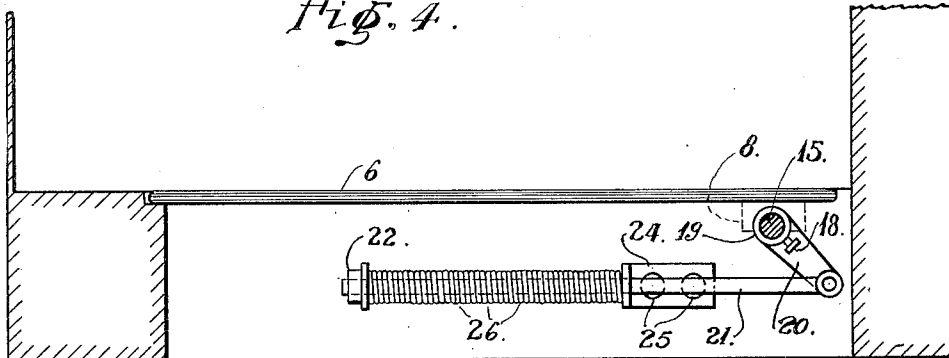
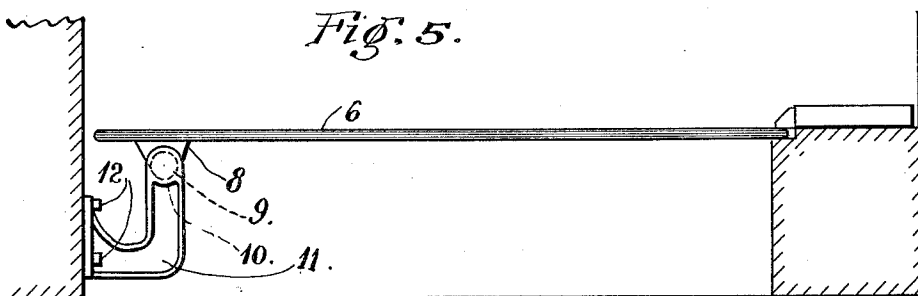


Fig. 5.



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UNITED STATES PATENT OFFICE.

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TRAP-DOOR.

1,089,367.

Specification of Letters Patent.

Patented Mar. 3, 1914.

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To all whom it may concern:

Be it known that I, HARRY H. SCHROYER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Trap-Doors, of which the following is a specification.

The present invention relates to that form of trap door employed in connection with vestibule cars and is used for closing the stair opening of the vestibules, to provide when desired, a flooring over the vestibule.

The objects of the present invention are to provide a means for lifting such doors by a tension operated mechanism and to construct this mechanism of a relatively few parts rendering it cheap and simple of manufacture and durable of use.

A further object of the invention is to so arrange the supporting means for the door as to permit of the removal of the door without disturbing the position and arrangement of the door lifting mechanism.

The invention further consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings: Figure 1 is a plan view of a portion of a platform of a vestibule car with the door closed and with the parts forming the subject matter of the present invention in operative position; Fig. 2 is a section taken on line 2—2 of Fig. 1 looking in the direction of the arrow, said figure being on an enlarged scale and with a part of the door broken out; Fig. 3 is a section on line 3—3 of Fig. 1, looking in the direction of the arrow, and showing the door in raised position; Fig. 4 is a view similar to Fig. 3 showing the door in lowered position; and Fig. 5 is a section on line 5—5 of Fig. 1, looking in the direction of the arrow.

The present invention, as previously stated, relates to a trap door used in connection with vestibule cars for covering the opening in the platform in which the stairs are placed. These stair openings are never intended to be exposed except during the periods when passengers are getting on and off the cars and the trap doors when in lowered position make a solid platform across the vestibule eliminating any danger of injury to the passengers by their falling down the stair opening. Since the opening and closing of these doors occurs at relatively frequent intervals it is expedient to provide

some means for automatically forcing the doors to open position when suitable catch mechanism is released, and the present invention deals with a new and novel arrangement by means of which this automatic opening of the door is effected.

Referring to the drawings, and particularly to Fig. 1, a door 6 is there illustrated which can be of any suitable size and construction, and which when in closed position overlies the stair opening in the vestibule of the car. Said door may be locked in closed position by any suitable sort of catch mechanism and the door is provided on its under face (see Figs. 1 and 2) with a rib or enlargement 8 which at one end is formed to produce a trunnion 9 adapted to seat within an opening 10 in a supporting member or bracket 11, which latter is removably attached to the body of the car by suitable removable locking means as bolts 12. The trunnion 9 and socket or opening 10 form a socket and pin connection between the door and bearing 11 and this connection is of a rotatable order whereby said door revolves in said bearing as a pivot when the door moves from its open to its closed position.

The opposite end of the rib 8 is formed with a socket 13 which socket is of polygonal formation and receives the polygonal shaped end 14 of a shaft 15 which is rotatably mounted in suitable portions 16 of the car body. The shaft end 14 in conjunction with the socket 13 forms an interlocking connection between the shaft 15 and the door, and said end 14 further serves as an additional support for the door so that by means of the shaft 15 and the bracket 11 the door is supported upon both sides and maintained in position.

The shaft 15 has a rotatable fit within the portions 16 of the car body in which it is mounted, and a collar 17 is attached to said shaft which collar, when the parts are assembled, as will be more clearly seen from Fig. 2, lies between the end of the rib 8 of the door and one of the portions 16 in which the shaft is mounted, thus when the parts are assembled the shaft is held by the collar and the door against lateral movement in either direction and said door when positioned forms in effect the means which locks the shaft 15 in place.

The shaft has connected thereto by suitable locking means, as for instance thumb

nuts 18, a sleeve 19 from which extends a crank arm 20 to which is attached one end of a rod 21, the other end of this rod is free, and adjacent said free end is formed an abutment 22. This rod passes through an opening 23 in an L-shaped plate 24, said plate being fixedly held by suitable fastening members 25 to a portion of the car structure. The plate 24 thus serves as a guiding means and support for the rod 21 and interposed between the plate and the abutment 22 is a coil spring 26 which surrounds said rod.

When the door is in lowered position the parts assume the position shown in Fig. 4 wherein the rod is pulled back and the spring 26 compressed between the abutment 22 and the plate 24. When the catch mechanism is released the spring expands forcing the rod forward, carrying the crank arm forward and rotating the shaft 19 by means of the interlocking connection between said shaft and door the rotations of the shaft will turn the door about its pivotal connection with the bearing 11 and thus throw the door to the upright or open position shown in Fig. 3. The door in moving from its closed to its open position will cause a slight tilting of the rod 21 the tilting movement reaching its greatest extent when the crank arm 20 is approximately in its true vertical position as shown by dotted lines in Fig. 3. The rod 21 will then assume the position shown in dotted lines in this same figure, and in order to allow of this necessary tilting movement of the rod the opening 23 in the plate 24 is somewhat larger than the diameter of the rod.

The operation of this door operating mechanism is believed to have been already fully set forth and need not be explained further.

It is to be observed that the actuating parts for the door are of a relatively small number comprising only the shaft 19, the arm 20, the rod 21, the spring 26, the plate 24 which forms the guide and support for the rod and the abutment 22 for the spring. By thus reducing the parts the device is rendered very cheap and simple as well as durable in use.

In order to remove the door the bracket 11 is removed from position and the door can then be readily pulled out. It will be observed that this can be done without disturbing in any way, or removing any portion of, the door opening mechanism, thus making the operation of removing or positioning the door a quick and simple one.

As stated, when the door is in place it

serves to lock all of the operative parts in position so that a disarrangement of the same is rendered improbable under ordinary usage.

I claim:

1. In a device of the class described, the combination of a door, a pivotal mounting for the door, mechanism for raising the door comprising a crank operatively connected to the door, a rod connected at one end to the crank and having its other end free, a stationary guide member for the rod located intermediate its ends, an abutment adjacent the free end of the rod and a tension member about said rod interposed between the guide member and abutment, substantially as described.

2. In a device of the class described, the combination of a door, a pivotal mounting for the door, mechanism for raising the door comprising a crank operatively connected to the door, a rod connected at one end to the crank, and having its other end free, a stationary plate located intermediate the ends of the rod, said plate having an opening through which the rod passes, an abutment adjacent the free end of the rod and tension means about said rod and interposed between the plate and abutment, substantially as described.

3. In a device of the class described, the combination of a door, means for supporting the door, comprising a removable supporting member in which the door is pivotally mounted and a rotatable supporting member having an interlocking connection with the door, said door when positioned serving to hold said rotatable supporting member in position and tension actuated means for rotating said rotatable support to move the door to raised position, substantially as described.

4. In a device of the class described, the combination of a door, means for supporting the door comprising a removable supporting member in which the door is pivotally mounted, a shaft forming a second supporting member for the door, said shaft having an interlocking connection with the door, a fixed bearing for said shaft a collar on said shaft lying when the parts are assembled between said fixed bearing and the end of the door and tension actuated means operatively connected for rotating said shaft to open the door, substantially as described.

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