(No Model.) 2 Sheets—Sheet 1.

J. D. O'DONNELL.

OPENING AND SHUTTING THE DOORS OF RUNNING VEHICLES.

No. 248,876. Patented Nov. 1, 1881.

Fig. 1.

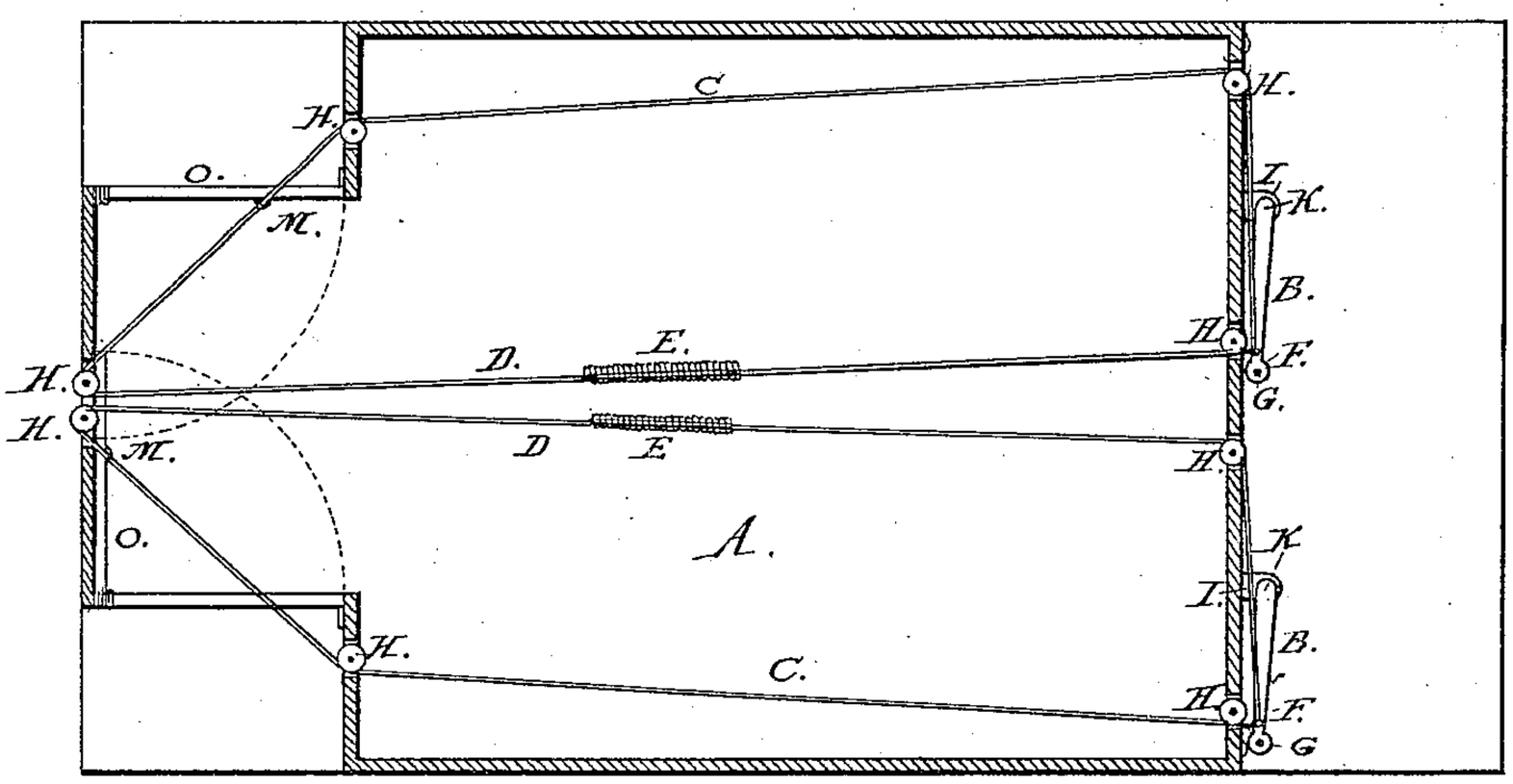


Fig. 2.

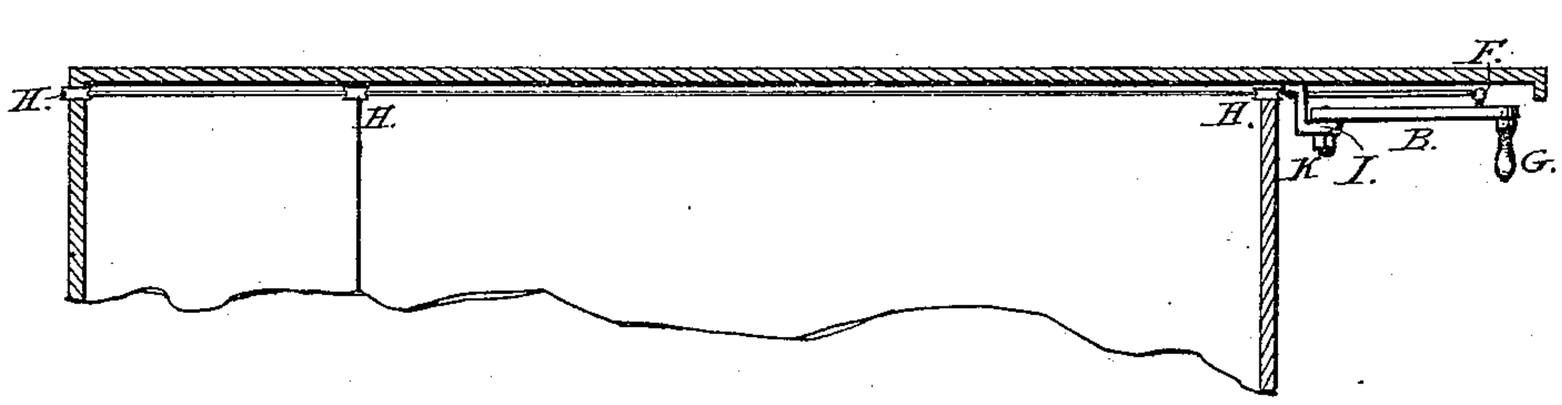
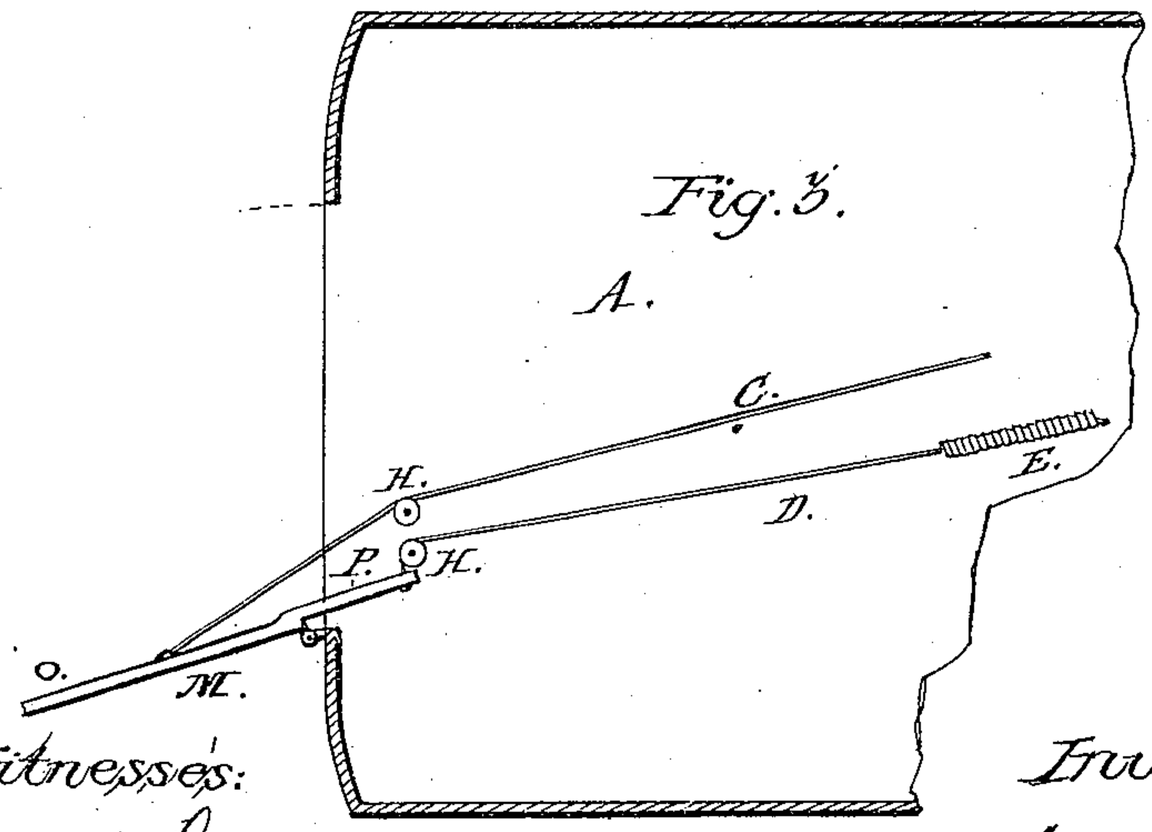


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

J. D. O'DONNELL.

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Fig. 4.

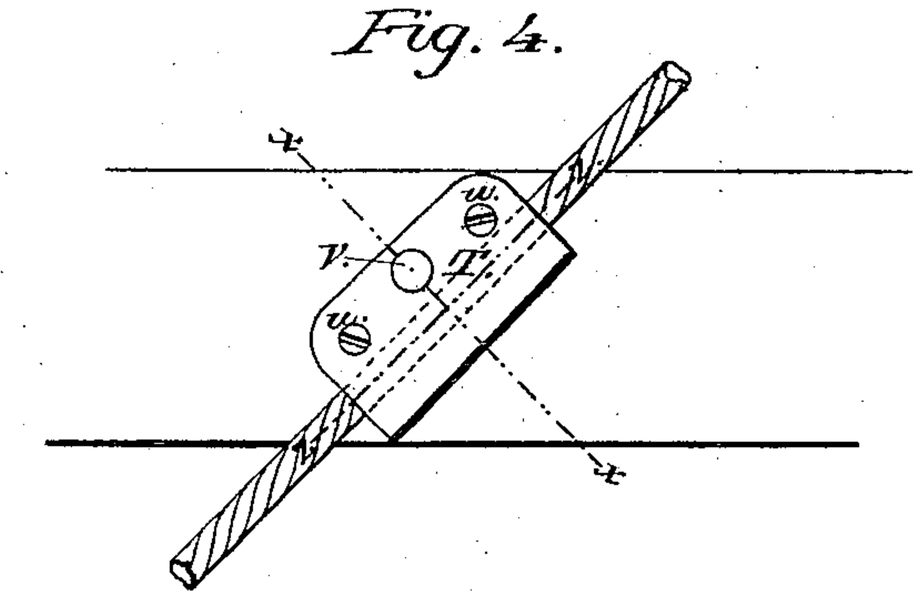


Fig. 5.

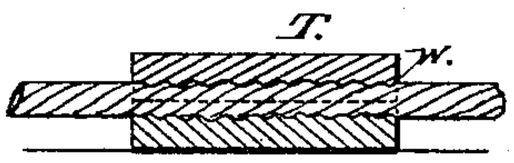


Fig. 6.

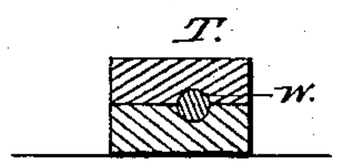


Fig. 7.

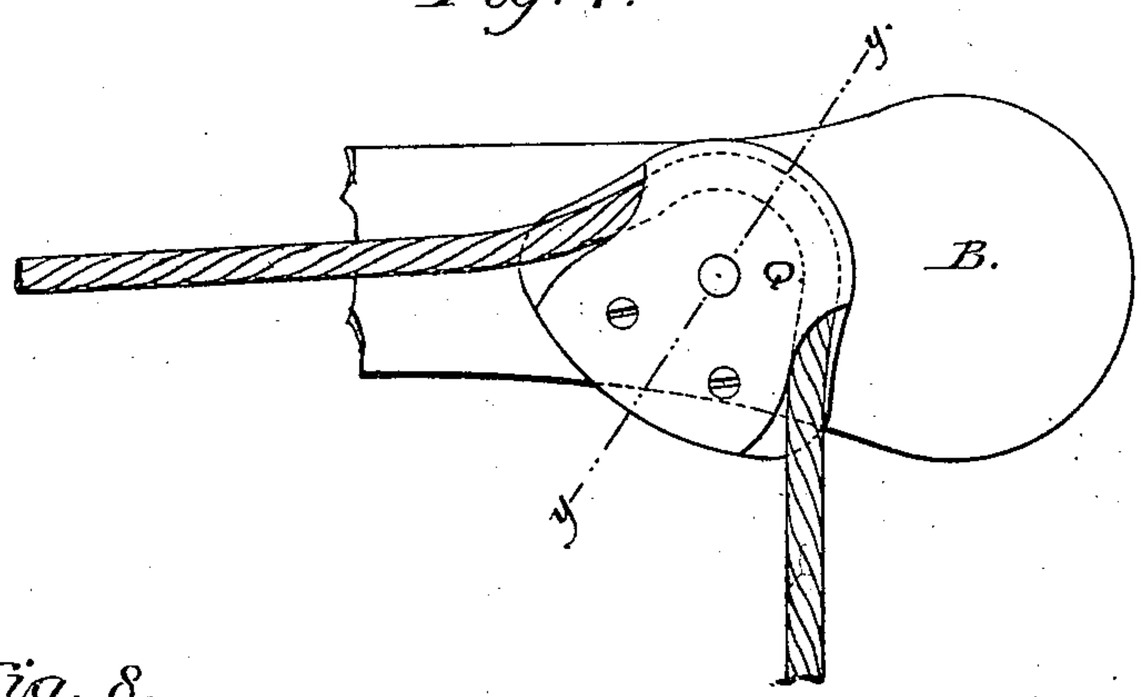
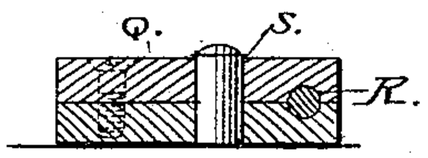


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES D. O'DONNELL, OF WASHINGTON, DISTRICT OF COLUMBIA.

OPENING AND SHUTTING THE DOORS OF RUNNING VEHICLES.

SPECIFICATION forming part of Letters Patent No. 248,876, dated November 1, 1881.

Application filed July 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES D. O'DONNELL, of the city of Washington and District of Columbia, have invented a new and useful Improvement in Opening and Shutting the Doors of Running Vehicles, of which the following is a specification.

My invention is an improvement in opening and closing doors of running vehicles.

It consists, in connection with the door of a vehicle or coach which is properly hinged to the frame, of a certain continuous cord, provided with a tension-spring, and passing around pulleys in the upright walls of said coach, said cord being connected to a crank pivoted in the forward part of said coach at a suitable point, and also with the door of the same at the rear, the object being to close or open and hold closed and open the said door by a positive movement from the hands of the driver, all of which will be fully set forth hereinafter.

In order to enable those skilled in the art to manufacture and apply the device, I will proceed to describe the same, reference being had to the accompanying drawings, forming a part of this specification.

In my drawings, Figure 1 is a plan of the "Herdic" coach with cranks, cords, and pulleys in position, one door open and the other shut. Fig. 2 shows a sectional view of the top of a coach with cords, pulleys, and cranks in position, the crank about passing the center. Fig. 3 shows a view of an omnibus or street-car with a lever attached to the door, and cords and pulleys in position. Fig. 4 is a plan showing the clamping device pivoted to the door of a coach. Fig. 5 is a section of the same on line *z z* of Fig. 4. Fig. 6 is a section of the same on line *x x* of Fig. 4. Fig. 7 is a plan of the clamping device pivoted to the crank B. Fig. 8 is a section of the same on line *y y* of Fig. 7.

A represents the plan of a coach. B B are cranks. C C are cords for shutting the doors. D D are cords for opening the same. E E are springs forming part of the cords D D. F F are lugs on top of the cranks B B. G G are handles to the cranks. H H are pulleys over which cords are run. I I are brackets attached to the top of the coach. K K are crank-shafts having nuts and washers on their ends. M M are lugs on top of the doors. O O are the doors. P is a lever fixed to the inside of a door of an omnibus or other vehicle having a door opening on the outside. Q is one part of a clamp for the cord, pivoted on top of the crank B. R is a groove or corrugation in one of the clamps. S is an orifice in the same. T is one part of a clamp for securing a cord in position at the top of the door. *u u* are screws for clamping parts together. V is an orifice in the same, and *w* is a groove in one of the clamps.

In adapting this device to vehicles of any kind, one cord, preferably fine wire cable, may be made to form the two cords C and D by having one end attached to the spring E, thence extending through the front, and by means of a clamp it is secured to the crank B. From this it is passed through the front to the inside of the vehicle, to a clamp on top of the door, and, finally, it is secured to the other end of the spring E, forming a complete circuit. To secure the proper length for cord C it should first be secured by the clamp Q, pivoted on top of the crank; thence it is passed over the pulley through the front to the inside and over the pulley at the back to the clamp T, pivoted on top of the door, and passed loosely between the parts and drawn taut. The two parts of the clamp being now securely screwed together, the cord is passed over the pulley at the back and fixed to the end of the spring. One of the clamps is made with a curved groove, as at the front, and the cord therein is always bent. The other is made straight, because the cord is very little out of a straight line. Grooves in both clamps are formed to give the clamp a firm hold on the cord. The clamps are pivoted to prevent any twisting of the cords. The crank-shaft works in an orifice on the end of a bracket, I, and is secured thereto by a nut and washer.

In omnibuses the cords C and D would at the front be passed through from the inside to the top of the same on the outside, and be attached to the crank behind the driver's seat.

In operating the device it is only necessary to take hold of the handle, to turn the crank half round, and open or shut the door. When the crank is in the position shown in Fig. 1, the cord will come inside of the axis, and the push-

ing or pulling of the door cannot move the crank from its position.

It will readily be seen that the cord which shuts the door, having no tension, will, for the same reason, hold the door as securely as a latch could do. The length of cord necessary to allow the crank to pass over the center is obtained by means of a spring, E, attached to the cord D in the center of the coach. A sufficient power only is required in this spring to enable it to draw back the door and resume its natural length after the crank has passed from one side to the other in opening the door, or vice versa to take up slack when the door is being shut. This spring may be of spiral steel or rubber, such as is ordinarily used to keep doors closed in winter. The length of the cranks must be sufficient to allow the distance between the lug and axis to equal one-half the distance between the lug M and the pulley at the back of the coach.

There being two doors to the Herdic coaches, two sets of cords, pulleys, cranks, &c., are required, while in an omnibus or street-car having but one door one of each only will be required. The device is applicable to hackney carriages and other vehicles having a door on either side, only a slight change in the direction of the cords being necessary.

Omnibuses or other vehicles having egress at the back may be fitted with double doors and operated by one crank, the cords which open the doors being attached to a single cord at some convenient point within the vehicle, and so with the cords which shut the doors.

The doors of Herdic coaches are generally operated by means of two cords, one spring, and one latch. In opening a door one cord is pulled to raise a bar of metal, which trips the latch, and a spring on the hinged edge of the door opens the same. In shutting the door a second cord is pulled, which shuts and latches the door. Considerable difficulty and annoyance are experienced frequently in operating the doors, and violent jerking being often necessary, the doors are broken and unnecessarily left open at times.

In omnibuses ordinarily the doors are opened and shut by means of a leather strap attached to the center of the door, and, passing out at the front on top of the roof, is attached to some convenient point. It is operated by the driver, who keeps a strap under his foot when the door is closed, or removes his foot when the door is to be opened.

The superiority of my invention consists in its simplicity, cheapness, and efficiency. A few feet of cord, four pulleys, one spring, and one crank to each door is all that I require in applying my device. Its effectiveness will be appreciated when it is considered that by a slight exertion the driver may open or close the door by simply turning a crank.

I am aware that car-doors have been opened and closed from a crank in the forward part of a car by means of cords passing over pulleys and connecting with a sliding door; but to such, and particularly that of Little, Reissue No. 5,791, I make no claim.

What I claim as my invention, and desire to secure by Letters Patent, is—

In combination with the doors of a coach or vehicle, the cords C C and D D, springs E E, and cranks B, all arranged and operating substantially as and for the purpose set forth.

J. D. O'DONNELL.

Witnesses:
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