

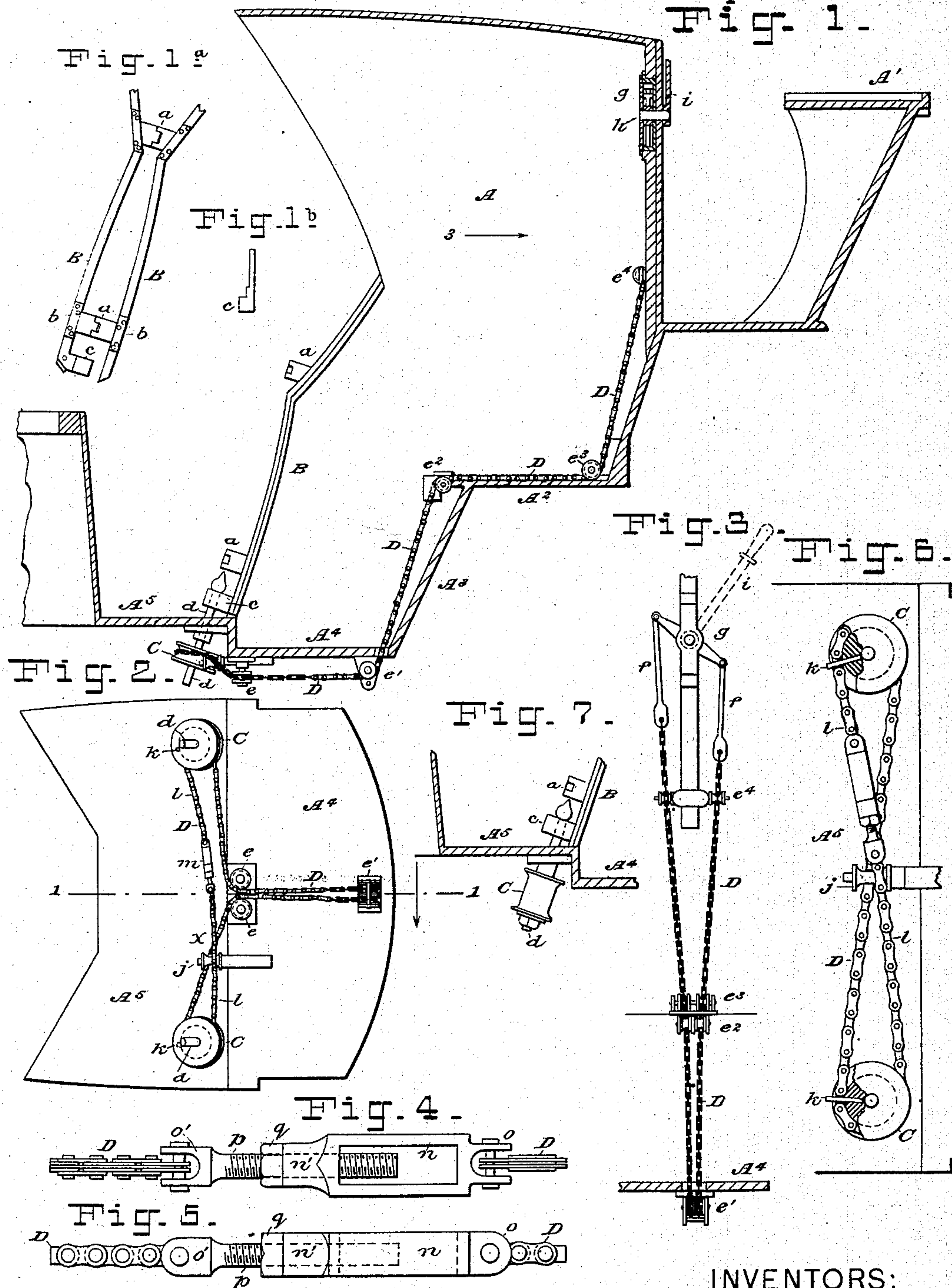
(No Model.)

F. & C. FORDER.

MEANS FOR OPENING AND CLOSING THE DOORS OF HANSOM CABS.

No. 325,739.

Patented Sept. 8, 1885.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

FREDERICK FORDER AND CHARLES FORDER, OF WOLVERHAMPTON,  
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MEANS FOR OPENING AND CLOSING THE DOORS OF HANSOM-CABS.

SPECIFICATION forming part of Letters Patent No. 325,739, dated September 8, 1885.

Application filed May 15, 1885. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK FORDER and CHARLES FORDER, both subjects of the Queen of Great Britain, and residents of  
5 Wolverhampton, England, have invented certain new and useful Improvements in Means for Facilitating the Opening and Closing of the Doors of Hansom-Cabs, of which the following is a specification.

10 The object of this invention is to provide simple and efficient means whereby, upon one of the folding doors of a hansom-cab being opened or closed by the "fare," the other door will open or close therewith automatically, and also to provide for use, when required,  
15 additional means whereby both doors may be readily opened and closed by the driver from his seat at the back of the cab.

In the drawings, which serve to illustrate  
20 our invention, Figure 1 is a longitudinal vertical section of a hansom-cab body provided with our improvements, the section being taken in the plane of line 1 1 in Fig. 2. Fig. 1<sup>a</sup> and 1<sup>b</sup> are detached detail views, which will  
25 be hereinafter described. Fig. 2 is a plan of the bottom of the cab-body, looking up from below, the view being squared down from Fig. 1. Fig. 3 is a face view of the mechanism in the back of the cab-body, viewed from  
30 arrow 3 in Fig. 1. Figs. 4 and 5 are elevations of the screw-coupling or turn-buckle in the chain, enlarged and detached. Fig. 6 is a plan view showing the arrangement of the chains when the doors are designed to be opened only  
35 by the fare. This view is similar in character to Fig. 2, but on a larger scale. Fig. 7 illustrates a slight modification, that will be described hereinafter.

A represents the cab-body; A', the driver's  
40 seat; A<sup>2</sup>, the rider's seat; A<sup>3</sup>, the heel-board; A<sup>4</sup>, the bottom or foot board, and A<sup>5</sup> the platform outside of the doors. The cab has folding doors, as usual, rabbeted where they meet in closing.

45 B represents one of the doors, which is connected to the stile B' by hinges *a a* in the usual way.

In Fig. 1 the door B is shown closed, and in Fig. 1<sup>a</sup>, which is an edge view of the door and  
50 stile, the door is shown thrown open. We usually let the hinges into the door and stile

and cover them with flush-plates *b b*, the same screws serving to secure both the hinges and plates. To the bottom of the door we fix a bracket, *c*, an end view of which is seen in  
55 Fig. 1<sup>b</sup>. This bracket is let in flush, and is recessed at its upper part to take under the plate *b*, that covers also the lower hinge. It is secured to the doors by screws. In this bracket *c* is fixed a pin, *d*, the axis of which  
60 is in line with the axis of the hinges *a*. This pin extends down through an aperture in the platform A<sup>5</sup>, and on its lower end, below A<sup>5</sup>, is splined a grooved pulley, C.

We have described above one door and its  
65 appliances, and this will serve for both doors, which are constructed and provided alike.

D is a chain or other flexible connector—as a cord, for example. This chain passes around the pulleys C, around guide-sheaves *e, e', e<sup>2</sup>, e<sup>3</sup>, e<sup>4</sup>*, arranged in pairs, and its ends are connected, respectively, to two links, *f f*, which  
70 are coupled at their upper ends to a rocking lever, *g*, fulcrumed on a spindle, *h*, in the back of the cab in front of the driver. On the out-  
75 side of the cab, at the back, is an operating-handle, *i*, fixed to the spindle *h*, and within the driver's reach. The chain D is crossed at  
80 *x*, Fig. 2, in order that the doors may be swung in opposite directions, and, in order to avoid the chafing and friction between the  
85 two oppositely-moving sides of the chain, at this point we arrange between them a small sheave, *j*, mounted on a suitable bracket. The chain is fastened to the two pulleys C at the  
90 points *k k*, and the part *l* of the chain between these attaching-points is left a little slack, as indicated in Figs. 2 and 6, and is provided with a turn-buckle or screw-coupling, *m*, in order that the amount of this  
95 slackness may be regulated. The attachment of the chain to the pulleys allows each pulley to make half a revolution, which is enough to throw the doors wide open.

The object in leaving that portion of the  
100 chain *l* between the fastening-points *k* a little slack is to permit the overlapping door to open far enough for the other or underlapping door to clear before the latter door starts to open; also, in closing, the door that must close first will start to close a little ahead of the other.

The operation is simple. If the driver wishes



to throw the doors open, he has only to operate the lever *i*, as will be well understood; or if the fare wishes to open the doors, it is only necessary for him to throw one open and the other opens automatically. The chain might be connected directly to lever *g*; but we prefer to employ the links *f* as intermediaries. The lever *g* serves to connect the ends of the chain, and thus make of it an endless chain, substantially. If it is not desired to extend the chain up to within reach of the driver, but to leave the fare to open the doors, the construction shown in Fig. 6 may be employed. In this construction the chain is endless, and passes only over the pulleys C C. The slack portion of the chain *l*, the turn-buckle *m*, and the sheave *j* are, however, employed in this construction. As the winding and unwinding of the chain tends to move the pulleys C endwise along their spindles *d*, we usually spline them thereon; but in lieu of this an elongated sheave, as shown in Fig. 7, may be employed. The turn buckle is shown enlarged in Figs. 4 and 5. It comprises a box or frame, *n*, to which the chain is coupled at *o*, a nut, *n'*, a screw, *p*, to which the chain is coupled at *o'*, and a lock nut, *q*. This coupling permits the length of the part *l* of the chain to be regulated very exactly. Any kind of chain may be employed, but we prefer that shown; and any similar form of screw-coupling or turn-buckle may be employed.

It will be understood that the parts of the chain inside of the cab may be, and usually will be, hidden by the upholstery, cushions, &c.

We are aware that a crossed endless chain passing over sheaves mounted on the hinging axes of folding doors, to compel both doors to open and close simultaneously, has been pro-

posed, and this we do not claim, broadly; but What we do claim is—

1. The combination, with the doors hinged to open outwardly, of the pulleys C C, mounted on axes fixed to the doors, and the endless chain D, mounted on and secured to said pulleys at *k k*, and the part *l* of said chain left slack, whereby one door is enabled to move a little in advance of the other, substantially as set forth.

2. The combination, with the doors of a hansom-cab, of the pulleys C C, mounted on pins or axes *d*, fixed to the doors at the bottom, the chain D, fixed to said pulleys, crossed and arranged to pass over suitable guide-sheaves to the back of the cab, the said guide-sheaves, the rock-lever, to which the chain is connected, its spindle, and the handle whereby the driver manipulates the chain, all arranged to operate substantially as set forth.

3. The combination, with the pulleys C C, of the chain D, fixed thereto, and the turn-buckle or screw-coupling *m*, arranged in the part *l* of said chain, substantially as and for the purposes set forth.

4. The combination of the pulleys C C, the chain D, mounted on said pulleys and crossed, as described, and the sheave *j*, arranged between said chains at the crossing-point, substantially as and for the purposes set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

FREDERICK FORDER.  
CHARLES FORDER.

Witnesses:

STEPHEN WATKINS,  
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