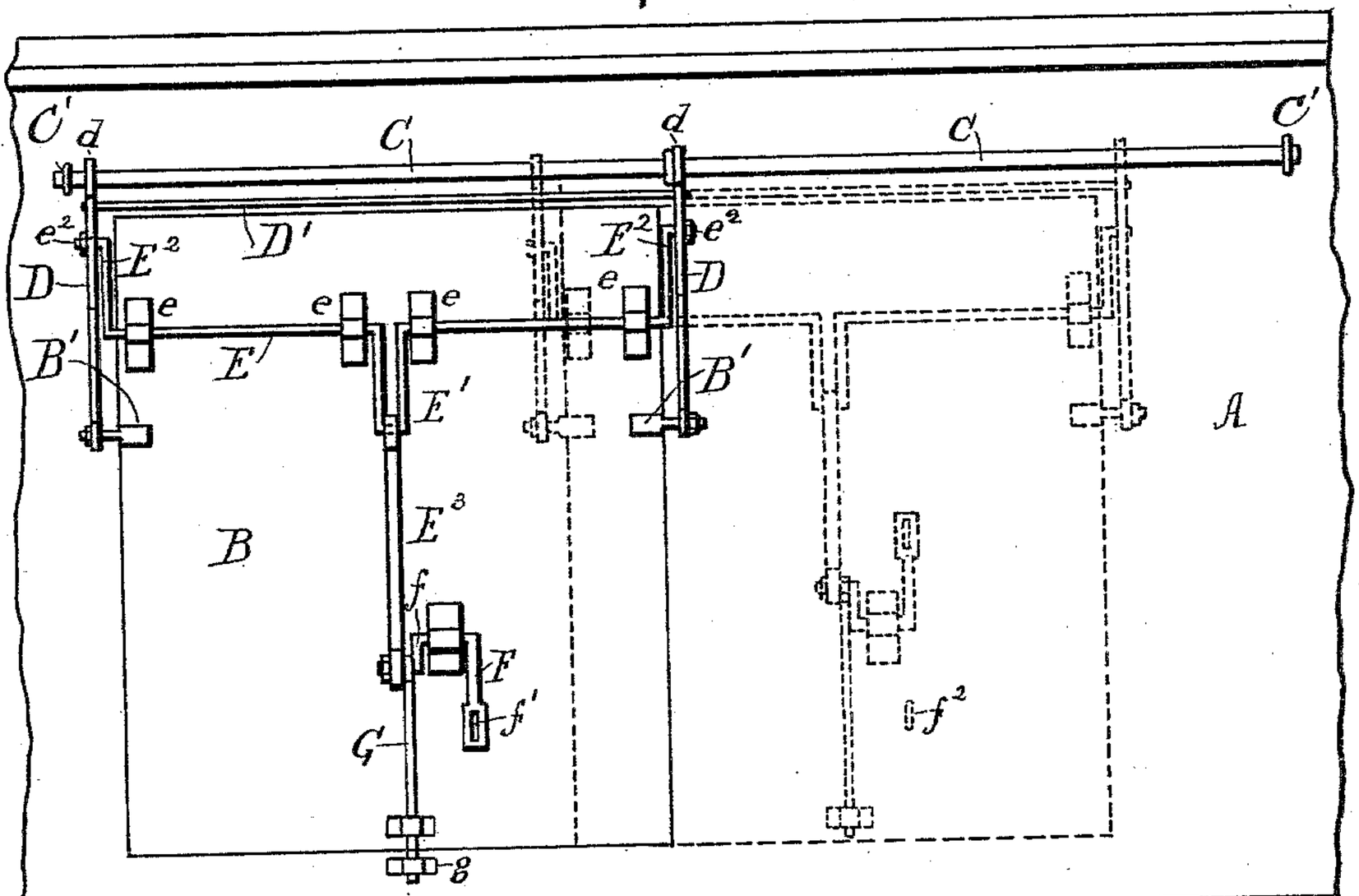
(No Model.)

E. L. PHIPPS.

CAR DOOR.

No. 411,677. Patented Sept. 24, 1889.

Fig. 1.



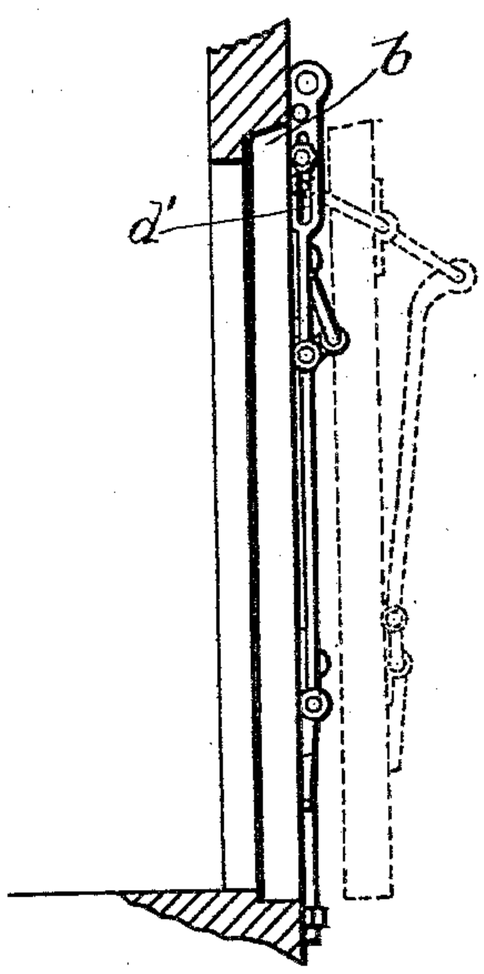


Fig. 2.

WITNESSES
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UNITED STATES PATENT OFFICE.

EDWARD L. PHIPPS, OF MILFORD, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO SOLON H. WILHELM AND ALMON D. WEBB, BOTH OF SAME PLACE.

CAR-DOOR.

SPECIFICATION forming part of Letters Patent No. 411,677, dated September 24, 1889.

Application filed July 11, 1889. Serial No. 317,117. (No model.)

To all whom it may concern:

Be it known that I, EDWARD L. PHIPPS, a citizen of the United States, residing at Milford, county of Oakland, State of Michigan, have invented a certain new and useful Improvement in Car-Doors; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a side elevation of a car with one of my improvd car-doors, showing by dotted lines the same partly open. Fig. 2 is a side elevation of the same with parts broken away, and illustrating by dotted lines the operation of the mechanism.

My invention relates to that particular class of car-doors known as "flush doors," which set into the side of the car flush with the outer surface of the car.

My invention consists of the peculiar combination of devices and appliances hereinafter specified, and more particularly pointed out in the claims.

A represents a car. B is its door. The door sets into the side of the car flush with its face, and the door-jambs at the top, bottom, and sides are preferably beveled, as shown at *b*, so that the door shall wedge closely into its seat.

C is the rail or rod along which the car-door traverses as it is being opened.

B′ represents hangers. They are attached to the door, and at their outer ends are journaled into the lower ends of the upright suspenders D. These suspenders loosely engage the rail or rod C at *d*, and a connecting-rod D′ serves to hold their upper ends in proper relation with each other.

E is a shaft extending across the door near its top, and held by suitable clips *e*. At E′ is a crank, and at the ends of the shaft are crank-arms E^2, the wrist-pins e^2 of which engage with the suspenders D by passing through slots *d′* formed therein. The crank E′ is, by a pitman E^3, engaged with the crank-arm *f* of the opening-lever F.

G is a locking-bolt, likewise engaged with the crank *f*. It engages a suitable socket *g* upon the sill of the door. The opening-lever F may be provided with a slot *f′*, adapted to engage over a hasp f^2, and the whole may be locked by a padlock or any other usual appliance.

The operation of the device is as follows: To open the door, the lever F is released and is lifted. This serves to draw the bolt G from its socket, releasing the bottom of the door. The motion of the lever, also, by lifting on the pitman E^3, raises the crank E′. This throws back the crank-arms E^2, and since they are resisted by the suspenders D the result is to carry the top of the door outwardly from the car. This movement of the door, by reason of the engagement of its hangers B′ with the lower ends of the suspenders, serves to swing the suspenders out at the same time, thus serving to throw the door still farther outward from its seat. Having raised the opening-lever F to its uppermost position, the crank *f* will have passed slightly beyond the line of resistance exerted upon it through the pitman E^3, leaving the lever in a position of stable equilibrium. The door having been thus lifted out from its seat beyond the face of the car, it is slid open along the rail or rod C. A stop C′ may serve to limit the movement in opening, and may also stop the door in closing at the proper point opposite its seat. To close the door, it is slid to its place opposite the opening and the lever F is turned down. As it is thus turned it forces the locking-bolt G into its socket. It also pulls down the crank E′. This throws forward the crank-arms E^2, which, being resisted by the suspenders D, serve to crowd the door snugly into its seat. The lever F may now be suitably locked.

It will be observed that the shaft E is located between the hangers B′ B′ and rail C. This arrangement gives to it, in connection with the suspenders D, the peculiar compound leverage mechanism shown, whereby a small rotation of the shaft serves to lift the door outward through a distance greater than the throw of the cranks E^2.

I do not limit myself to the lever F as a means for actuating the pitman and so rotating the crank E′, for this actuating mechanism may be considerably varied without de-

parting from my invention; and I would have my claims understood to comprehend as equivalents any suitable mechanism for actuating the said pitman. The same is true also of the means for actuating the locking-bolt G.

What I claim is—

1. The combination, with a car-door and traversing rail or rod, of suspenders depending from said rod and engaged with hangers upon the door, a shaft provided with cranks E′ E², turned in opposite directions, the latter engaging through slots in the suspenders, a pitman E³, and crank-lever F, substantially as and for the purposes described.

2. The combination, with a car-door and its traversing rod, of hangers upon the door engaged with suspenders depending from said rod, a shaft provided with cranks E′ E², located between the hangers and the rail, and in connection therewith a pitman and crank-lever for actuating said shaft, substantially as described.

3. The combination, with a car-door and its rail, of hangers upon the door and suspenders depending from the rail, with which the hangers are engaged, a shaft provided with cranks E′ E², the latter engaged with the suspenders by a slotted engagement, a pitman E³, crank-lever F, and locking-bolt G, substantially as and for the purposes described.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD L. PHIPPS.

Witnesses:
L. A. DOELTZ,
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