(No Model.)

A. G. GRAY.

CAR DOOR.

No. 466,164. Patented Dec. 29, 1891.

Fig: 1.

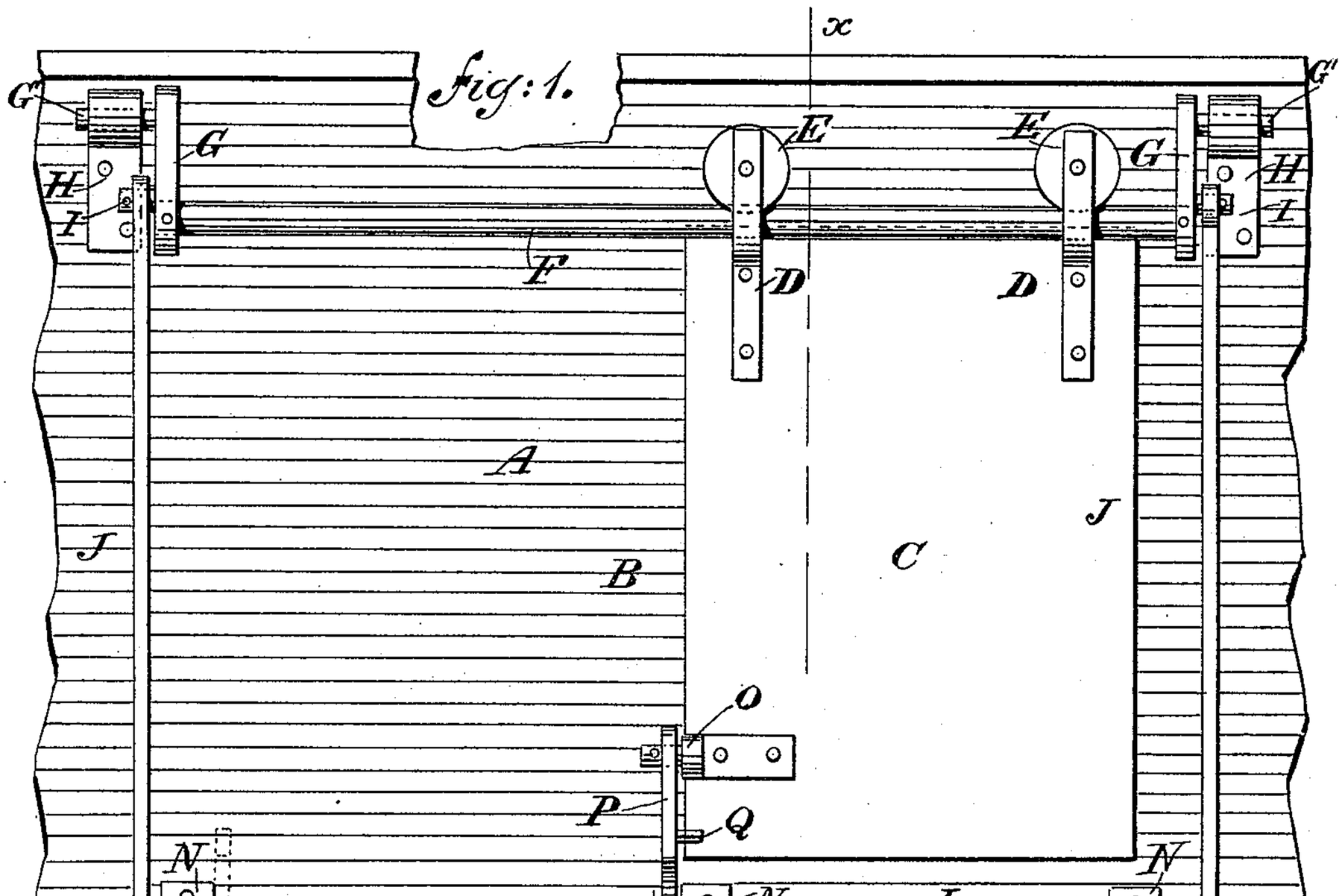


Fig: 4.

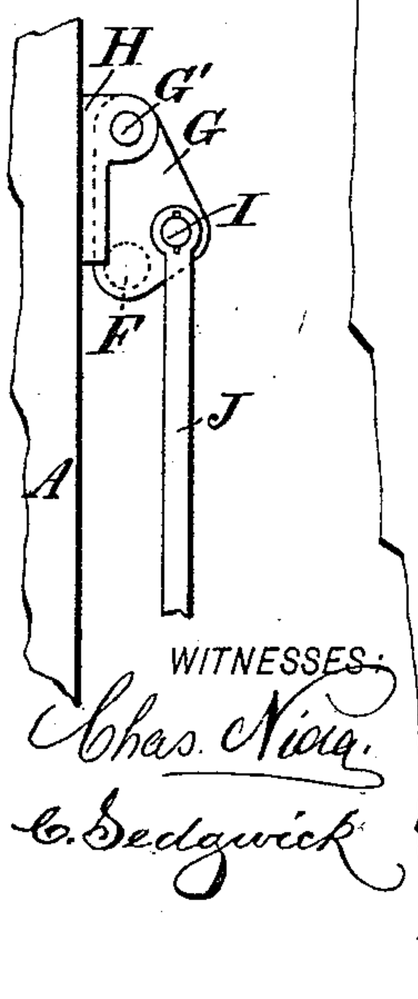


Fig: 2.

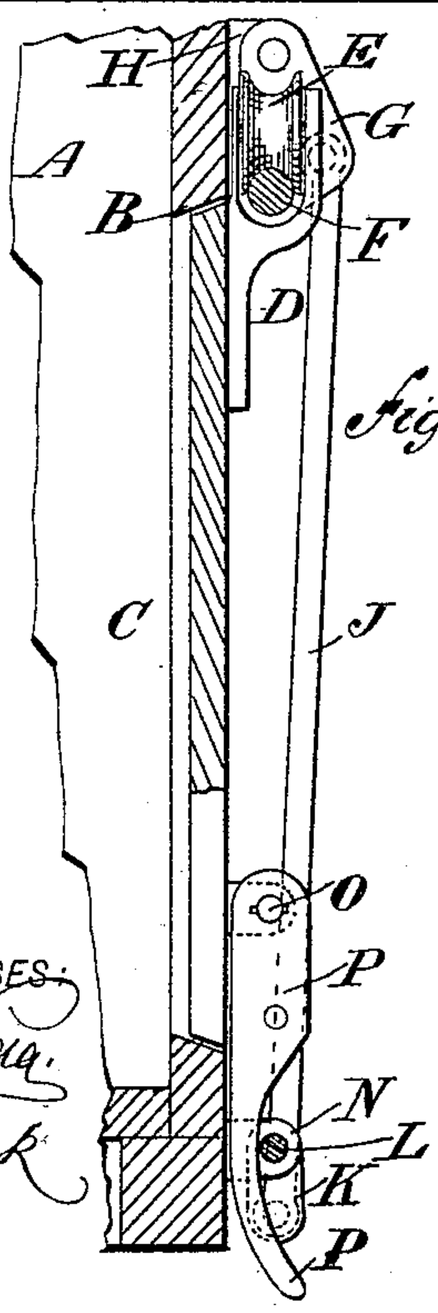
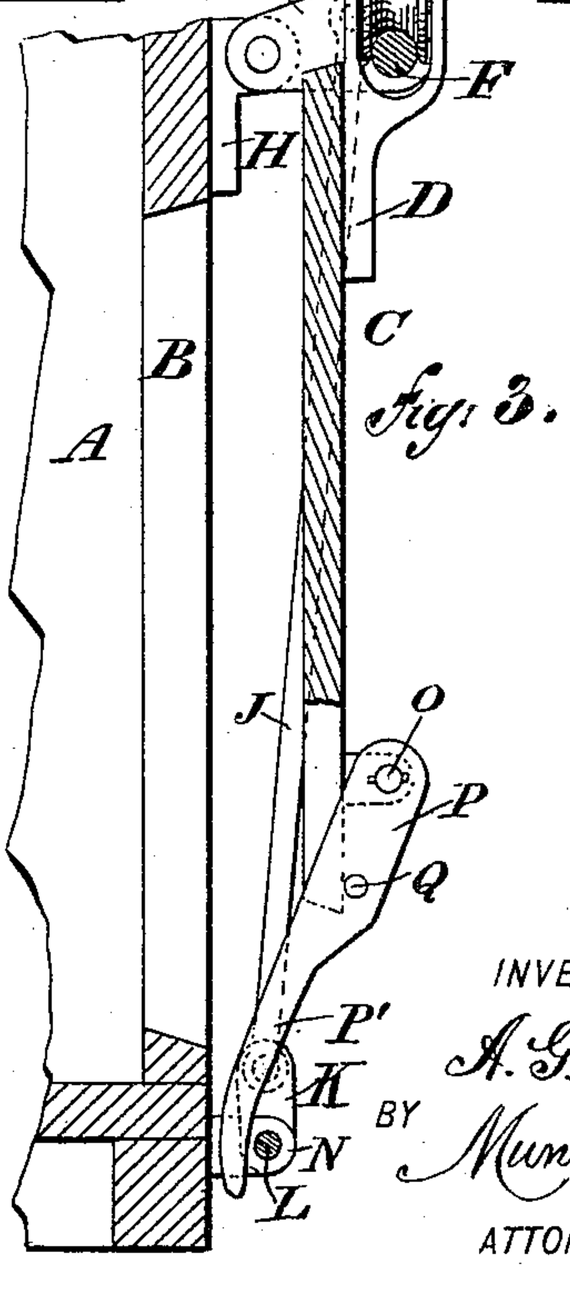


Fig: 3.



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ANDREW G. GRAY, OF ST. JOHN, CANADA.

CAR-DOOR.

SPECIFICATION forming part of Letters Patent No. 466,164, dated December 29, 1891.

Application filed March 14, 1891. Serial No. 384,998. (No model.)

To all whom it may concern:

Be it known that I, ANDREW G. GRAY, of St. John, in the Province of New Brunswick and Dominion of Canada, have invented a new and Improved Car-Door, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved car-door more especially designed for use on railroad freight-cars, and which is simple and durable in construction and can be readily moved forward and backward to open and close the car.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of part of the car with the improvement attached. Fig. 2 is a transverse section of the same on the line *x x* of Fig. 1, the door being closed. Fig. 3 is a like view of the same with the door open, and Fig. 4 is a side elevation of one of the crank-arms with the link attached.

The car A is provided in its sides with the usual openings B, adapted to be closed by a door C, fitting in the said opening, as is plainly shown in Fig. 2. The door C is provided on its outside and near its upper end with two hangers D, in which are journaled grooved pulleys E, mounted to travel on a longitudinally-extending shaft F, secured at its ends to crank-arms G, held on short shafts G′, mounted to turn in suitable bearings H, attached to the outside of the car, as is plainly illustrated in Fig. 1. When the door C is closed, the crank-arms G extend downwardly, as is plainly illustrated in Figs. 1 and 2.

On the crank-arms G are secured wrist-pins I, pivotally connected by links J with crank-pins I′ on crank-arms K, secured on the shaft L, extending longitudinally on the lower part of the car and mounted to turn in suitable bearings N, attached to the said car. One of the crank-arms K is provided with a pivoted handle K′, adapted to be taken hold of by the operator, so as to move the said crank-arm K, the shaft L, and the other crank-arm upwardly, so as to open the car-door, as hereinafter more fully described.

From the car-door C projects to one side a pin O, on which is hung an arm P, extending downward and having its lower end curved, as at P′, the curved part extending to the rear of the shaft L near one of the bearings N. On the arm P is secured a pin Q, adapted to pass over the front of the car-door C when the latter is in an uppermost position, as illustrated in Fig. 3, so as to prevent the lower end of the door from swinging outward when disconnected from the opening B.

The operation is as follows: The car-door C fits into the opening B of the car A, as is plainly illustrated in Figs. 1 and 2, the crank-arms G and K then standing in a lowermost position. Now, when it is desired to open the car-door, the operator takes hold of the handle K′ on one of the crank-arms K and swings the same upward, so that the two links J impart an upward-swinging motion to the crank-arms G, whereby the shaft F swings away from the side of the car outwardly and upwardly, thus carrying along the pulleys E, hangers D, and the car-door C, so that the latter is disengaged from the opening B. The car-door then assumes the position as illustrated in Fig. 3, and can now be readily run to one side by the operator taking hold of the curved end P′ of the arm P and pulling on the same to the left, so that the door C is moved to one side by the pulleys E traveling on the shaft F. The crank-arms K are so arranged that when they are swung into an uppermost position, as illustrated in Fig. 3, they remain in this position without help from the operator. When it is desired to close the door, the operator pushes on the arm P, so as to move the car-door C back to its former position in front of the opening B, and then the operator takes hold of the handle K′ and swings the crank-arms K downward, whereby the crank-arms G move in a like direction, thus swinging the shaft F, supporting the door C, downward, and the door inward and into the opening B. It will be seen that when the shaft F is in an outermost position, as illustrated in Fig. 3, the car-door C is a considerable distance off the side of the car, so that it can be readily moved to one side of the opening B. The arm or han-

dle P for winding the door may be placed on either side.

A car-door constructed in this manner is very simple and durable and can be readily opened and closed and run easily forward and backward, as above described.

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

1. In a car-door, the combination, with crank-arms and a shaft supported by the said crank-arms and adapted to carry the door proper, of links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, and a second shaft carrying the said second set of crank-arms and mounted to turn, substantially as shown and described.

2. In a car-door, the combination, with crank-arms and a shaft supported by the said crank-arms and adapted to carry the door proper, of links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, a second shaft carrying the said second set of crank-arms and mounted to turn, and a handle formed on one of the crank-arms of the second set of crank-arms, substantially as shown and described.

3. In a car-door, the combination, with the door proper provided with grooved pulleys, of a shaft on which the said pulleys are mounted to travel, crank-arms carrying the said shaft and mounted to swing on the outside of the car, links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, and a second shaft carrying the said second set of crank-arms and mounted to turn on the outside of the car, substantially as shown and described.

4. In a car-door, the combination, with the door proper provided with grooved pulleys, of a shaft on which the said pulleys are mounted to travel, crank-arms carrying the said shaft and mounted to swing on the outside of the car, links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, a second shaft carrying the said second set of crank-arms and mounted to turn on the outside of the car, and an arm or handle hung on the said door and extending to the rear of the said second shaft, substantially as shown and described.

5. In a car-door, the combination, with the door proper provided with grooved pulleys, of a shaft on which the said pulleys are mounted to travel, crank-arms carrying the said shaft and mounted to swing on the outside of the car, links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, a second shaft carrying the said second set of crank-arms and mounted to turn on the outside of the car, an arm or handle hung on the said door and extending to the rear of the said second shaft, and a stop-pin held on the said arm adapted to engage the said door, substantially as shown and described.

6. In a car-door, the combination, with the door proper provided with grooved pulleys, of a shaft on which the said pulleys are mounted to travel, crank-arms carrying the said shaft and mounted to swing on the outside of the car, links pivotally connected with the said crank-arms, a second set of crank-arms pivotally connected with the said links, a second shaft carrying the said second set of crank-arms and mounted to turn on the outside of the car, and means, substantially as described, for turning the said second shaft, substantially as set forth.

ANDREW G. GRAY.

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