

A. C. SAGER.

CAR DOOR.

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1,039,446.

Patented Sept. 24, 1912.

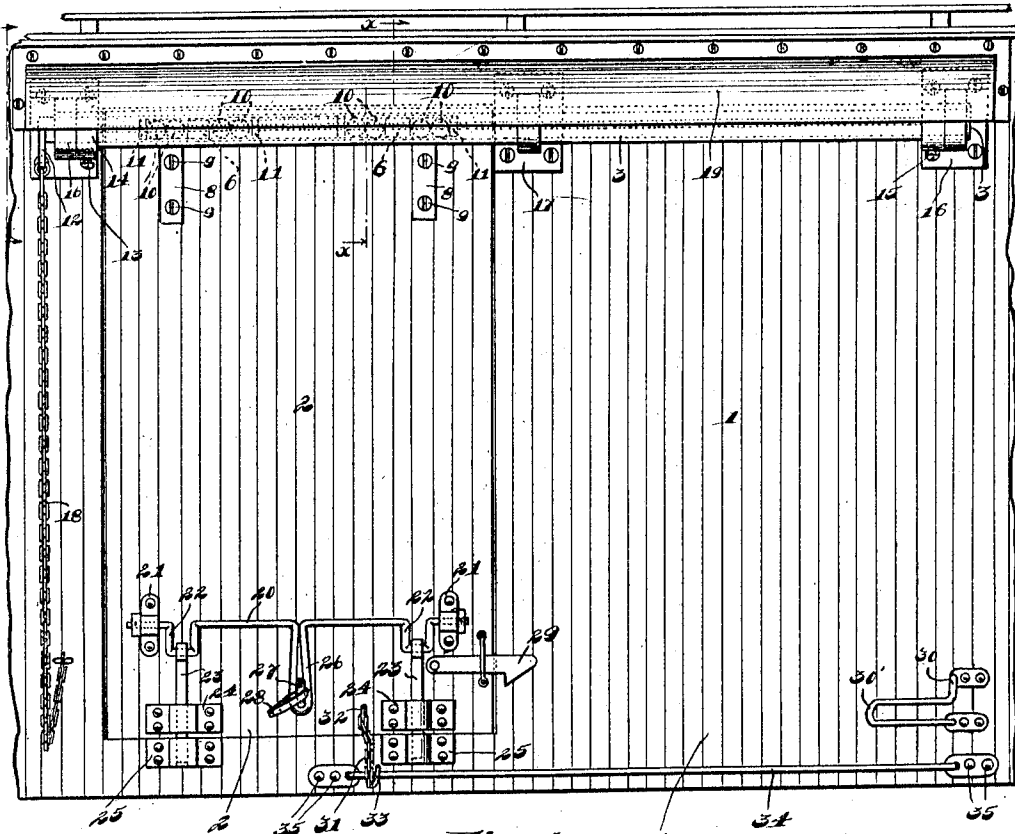


Fig. 1.

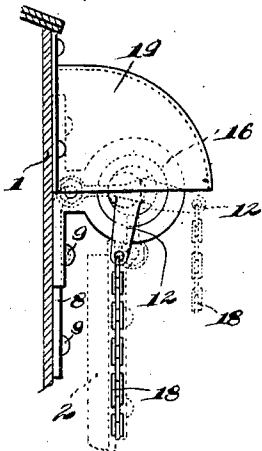


Fig. 2.

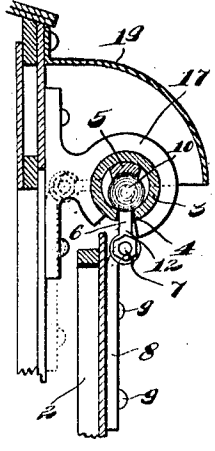


Fig. 3.

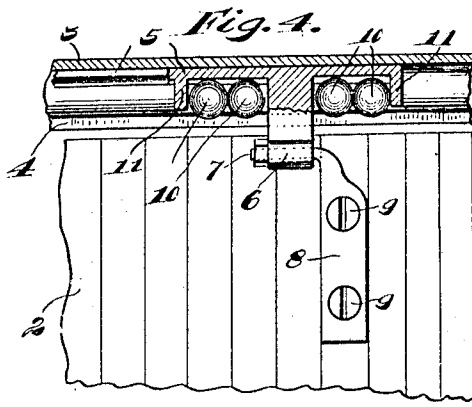


Fig. 4.

Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT C. SAGER, OF SAVANNA, ILLINOIS.

CAR-DOOR.

1,039,446.

Specification of Letters Patent.

Patented Sept. 24, 1912.

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To all whom it may concern:

Be it known that I, ALBERT C. SAGER, a citizen of the United States, and a resident of Savanna, county of Carroll, and State of Illinois, have invented certain new and useful Improvements in Car-Doors, of which the following is a specification.

My invention relates to sliding doors such as are adapted for use on freight cars, barns, etc., and has special reference to doors which are flush with the car or building when closed and which are heavy and difficult to handle.

The object of my invention is to provide a sliding door which, although flush with the side of the car or building when closed, is yet readily and easily fully opened, and which shall be strong and durable and secure against loss or displacement.

More specifically the object of my invention is to improve the supporting and operating means for such doors.

Further objects of my invention will appear hereinafter.

My invention resides in a sliding door having ball bearing supporting and operating means.

It consists further in a slotted tubular support rotatable by means of a lever and having ball bearing door supports slidable therein.

The invention further consists in such door holding and operating means in combination with means for securing the door in closed and open position.

My invention further resides in the various improvements, the several combinations and arrangements of parts hereinafter described and illustrated in the accompanying drawings, which form a part of this specification, and pointed out in the appended claims.

In the drawings Figure 1 is a front elevation of part of the side of a car having a door equipped with door supporting and operating means embodying my invention. Fig. 2 is an enlarged end elevation detail taken from the upper left hand corner of Fig. 1, showing in full lines the position of the operating lever when the door is closed, and in dotted lines the position of the lever and door just after the door has been withdrawn from its opening in the side of the car. Fig. 3 is a vertical section taken on the broken line $x-x$ of Fig. 1, the door having been withdrawn from its opening. Fig. 4 is an enlarged detail in partial section show-

ing the ball-containing member within the supporting tube.

Referring further to the drawings, 1 represents the side of the car; 2 is a car door flush therewith; 3 is an iron tube containing a slot for the accommodation of the sliding member 5, the latter having depending portions 6 to which the car door is secured by nuts 7 on the threaded stems respectively of the members 8 secured to the car door by means of bolts 9. The sliding member 5 is provided with two pairs of antifriction balls 10 near each end thereof, the four pairs being shown in dotted lines in Fig. 1 and two pairs being shown in full lines in Fig. 4. Lugs 11 in combination with the depending members 6 hold the balls in operative relation at all times. These balls, as will be seen from Fig. 4, are adapted to travel in the slot 4, the balls being however of greater diameter than the width of the slot, the balls thus taking the weight of the door and communicating same to the inner surface of the tube at the point of juncture thereof with said slot. I have found it advantageous to make the member 5 in one integral piece to prevent the binding effect which I have found present when the pairs of balls are held by separate members, especially when the member 5 is made to fit closely to the inside of the tube opposite the supporting members 6 for purposes of leverage as will be hereinafter described.

A plug having a bell crank lever 12 is secured in one end of the tube 3 by means of a bolt 13. This bolt also secures a collar 14 on said tube. A similar collar 15 is similarly secured at the other end of the tube, both collars being fixed in close association with bearing standards 16 secured to the sides of the car by bolts 13. A third bearing standard 17 adapted to surround only a portion of the tube 5 is provided on said tube midway between the other two standards. The opening in this medial standard permits the members 6 to pass therethrough. A chain 18 attached to the lever 12 enables a person standing on the ground to draw the door into closed position.

19 denotes a light metal shield which I sometimes employ to protect the mechanism just described against the weather.

The fastening mechanism comprises a rod 20 pivoted in boxes 21 and provided with a pair of bell crank levers 22 to which are hinged respectively pins 23 passing through channeled guide members 24 on the door and

into similar guide members 25 on the side of the car. These guide members are bolted to the door and car respectively in the usual manner. A loop 26 is turned centrally in the rod 20 and adapted to engage an up-standing ring or staple 27 in such manner that a lock or seal 28 may be inserted in said ring and prevent the loop from being withdrawn. It will thus be seen that when the loop is in the position just mentioned the car door is effectively secured against withdrawal at the bottom from its opening. A latch 29 adapted to engage a portion of the stop 30 holds the door in open position. The extension 30' on said stop keeps the door from swinging outwardly at the bottom when open. A chain 31 secured to the car door by means of a ring or staple 32 provided with a ring 33 slidable upon a longitudinal rod 34 secured at its ends by bolts 35. This chain and rod prevent the car door from swinging out objectionably while the same is being opened.

While the car door is in suspended position as shown in Fig. 3 the lever 12 is substantially horizontal. Assuming the car door to have been moved upon its ball bearings to a position directly opposite the opening in the car door, if the chain 12 is drawn downwardly the tube 3 in rigid association therewith will be turned and the depending portion 6 of the member 5 will be carried inwardly toward the car. This effect is secured through the leverage provided by the upper portion of the member 5 binding against the inner surface of the tube, the tube pressing also against the member 6. As the member 6 is turned inward and upward the door 2 pivotally mounted thereon is similarly moved and when the lever 12 is in a substantially vertical position the top of the door will have been carried into the recess provided for it, and flush with the side of the car. Still holding the chain with one hand the bottom of the door is pushed inwardly by the operator and it may then rest upon that portion of the side of the car immediately below it. The link 26, which has been in an upright position the while is now turned downwardly and the pins 23 are thereby projected into the locking members 25. Great difficulty has heretofore been experienced in the operation of doors of this kind largely owing to their weight. These difficulties are overcome by my present invention, which as has thus been seen, provided a car door which is extremely simple and easy of operation both in the sliding of the door and in securing it in the desired positions.

While I have illustrated a preferred form of my improved door in connection with a

car, I do not limit myself to such use, or to the precise form of construction shown as obviously the door is capable of being used variously and also it is apparent that the invention may be embodied in various forms of construction. I therefore wish to avail myself of such uses and modifications of the device as fall within the scope of the appended claims.

I claim—

1. The combination with a rotatable tubular supporting member; of members mounted for reciprocation therein; and a door hinged to said reciprocatory members.

2. In a sliding door of the class described a tubular supporting member, a sliding member within said tubular member, a door hinged to said sliding member, means for turning said tubular member and securing said door in fixed position, substantially as described.

3. In a sliding door of the class described, a slotted tubular supporting member, a sliding member in said tubular member and slot, a door pivotally connected with said sliding member, a lever on said tubular member adapted to turn the same, and means for holding the door in fixed position.

4. In a sliding door of the class described a tubular member rotatably mounted in fixed supports, a collar at each end of said tubular member adapted to prevent lateral movement thereof, a continuous longitudinal slot in said tubular member, a sliding member in said tubular member comprising a longitudinal bar with depending lugs and projections at each end thereof in the recesses between said depending lugs and projections, a door pivotally connected with said depending projections, said depending projections extending through said slot and constituting levers for the movement of said door, a lever rigidly secured to said tubular member for rotating the same, and means for maintaining said door in either closed or open position.

5. The combination with a tubular supporting member provided with a slot therein; of a plurality of reciprocatory members mounted in said tubular member; downwardly extending bars carried by said reciprocatory member, projecting through and operating in the slot aforesaid; and a door hinged to said bars.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses

ALBERT C. SAGER.

Witnesses:

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