March 18, 1930. A. WASBERG ET AL 1,750,653

DOOR LIFTING MEANS

Filed Sept. 24, 1928 2 Sheets-Sheet 1

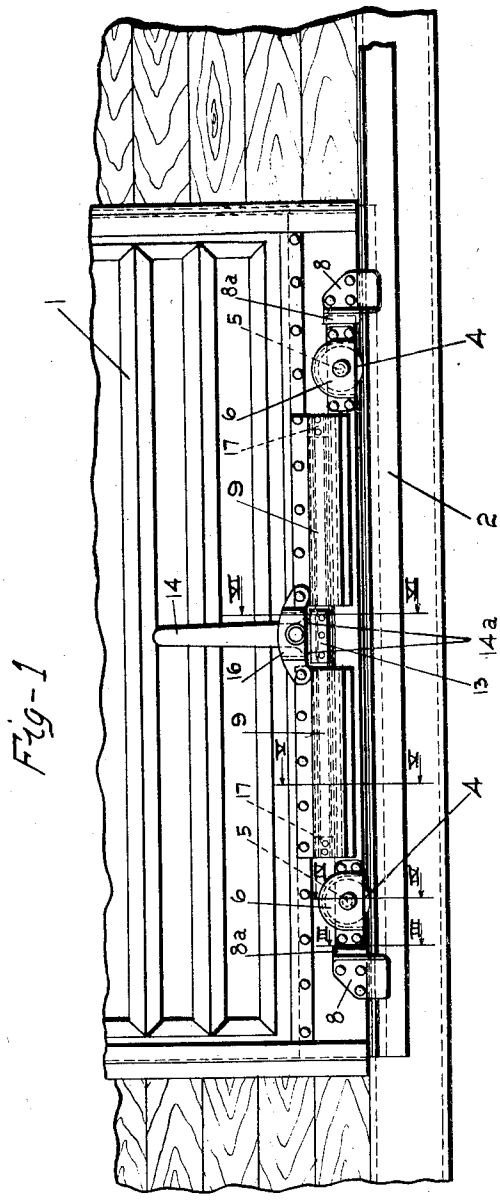


Fig-1

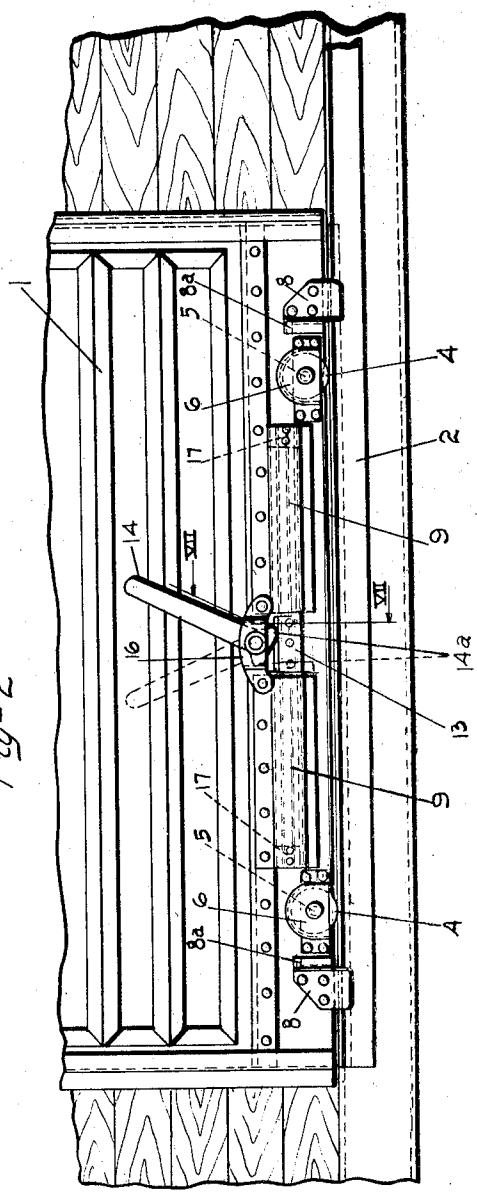


Fig-2

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March 18, 1930. A. WASBERG ET AL 1,750,653

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Filed Sept. 24, 1928 2 Sheets-Sheet 2

Fig-3

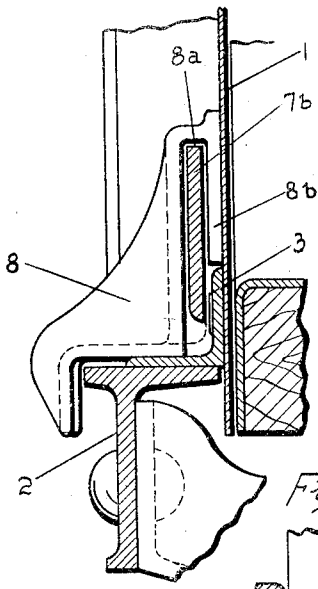


Fig-4

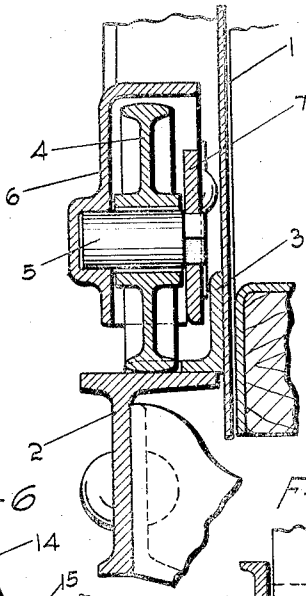


Fig-5

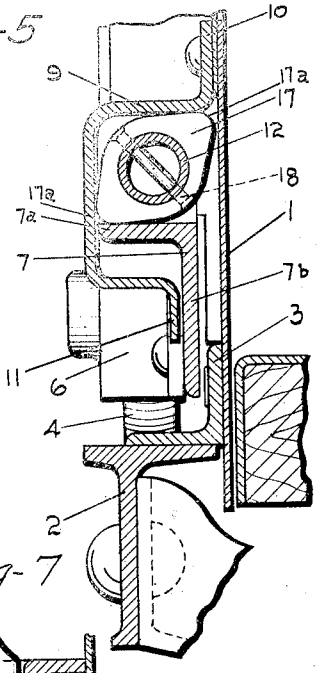


Fig-6

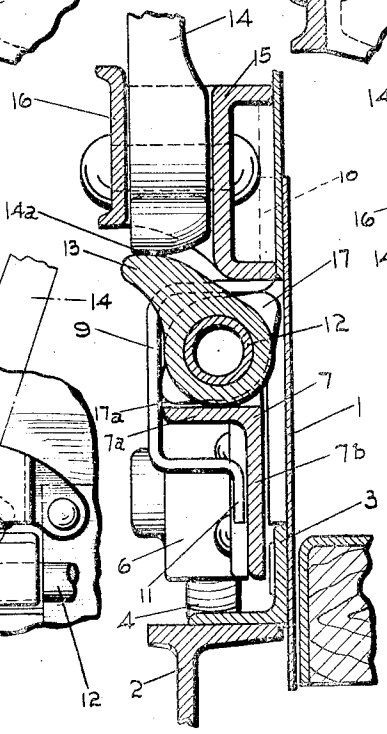


Fig-7

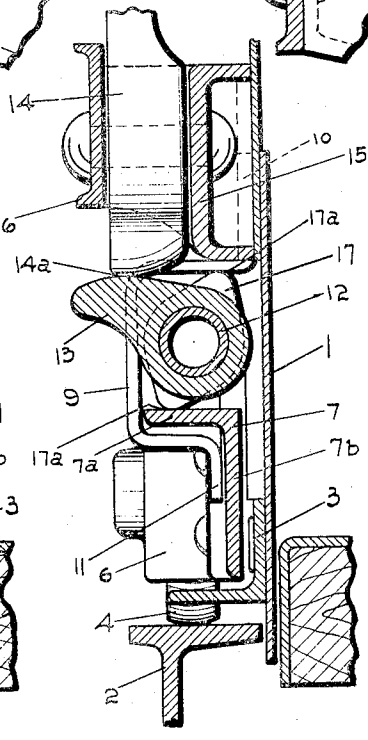
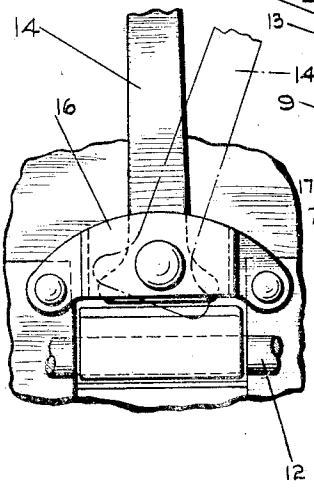


Fig-8



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UNITED STATES PATENT OFFICE

AXEL WASBERG AND KENNETH J. TOBIN, OF CHICAGO, ILLINOIS, ASSIGNORS TO CAMEL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

DOOR-LIFTING MEANS

Application filed September 24, 1928. Serial No. 308,120.

This invention relates to a door lifting means and concerns itself with a structure in which the door normally rests upon a track against sliding movement, and in which the door may be elevated for supporting the same upon rolling elements for sliding movement. The invention concerns itself primarily with the lifting means for elevating the door and temporarily supporting the same upon its rolling means in order that the door may be opened or closed.

The invention comprises a novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the drawings which illustrate a preferred embodiment of this invention and in which similar reference numerals refer to similar features in the different views.

Figure 1 is a fragmentary side elevational view of a house car embodying the door involving this invention and showing the door in its normally lowered position in frictional engagement with its supporting track.

Figure 2 is a view similar to Figure 3, illustrating the door in its elevated position and supported upon its rolling elements for sliding movements.

Figure 3 is a fragmentary enlarged sectional view taken upon the line III—III of Figure 1.

Figure 4 is an enlarged fragmentary sectional view taken upon the line IV—IV of Figure 1, looking in the direction of the arrows.

Figure 5 is an enlarged fragmentary sectional view taken upon the line V—V of Figure 1, looking in the direction of the arrows.

Figure 6 is an enlarged fragmentary sectional view taken upon the line VI—VI of Figure 1, looking in the direction of the arrows.

Figure 7 is an enlarged detail sectional view taken upon the line VII—VII of Figure 2, looking in the direction of the arrows.

Figure 8 is an enlarged fragmentary elevational view of the operating lever and the coacting parts adjacent thereto.

In the drawings there is shown a portion of the side of a house car having a doorway with the doorway closed by a sliding door 1 adapted to be supported upon a track adjacent one margin of the doorway. The door 1 is provided with means for frictionally supporting the same upon the track 2 against sliding movement. In the exemplification of this invention this supporting means is shown in the form of an angle bar 3 which is secured adjacent one margin of the door. The door is also provided with rolling means 4 for supporting the same upon the track 2 when it is desired to slide the door for opening or closing the same. The rolling elements 4 are journalled upon short axles 5, the outer ends of which are supported in housing members 6 attached to an angle member 7 extending parallel with the door. The inner ends of the axles 5 which may be of polygonal form extend through apertures in the angle member 7 at its ends and freely confined in pockets 8^a of guide member 8 secured to the door.

It will be noted that horizontal flange 7^a has been cut away adjacent the rollers 4 and adjacent the ends thereof and, that the vertical flange 7^b is slidably confined in the pocket 8^a of the guide members 8, as shown in Figure 3. These guide members have attaching flanges 8^b which are secured to the door and these flanges 8^b are spaced from the body portion of the members to provide the pockets 8^a. It will be noted that the vertical flange 7^b of the angle member 7 is confined at its ends in these pockets, but that there is a sufficient space between the lower end of said vertical flange and the supporting flange of the angle bar 3 to allow for relative movement between the door and said vertical flange 7^b.

Between the two roller housings 6 there is secured a pair of U-shaped metal members 9. The upper legs of these U-shaped members are provided with flanges 10 which are attached to the door and the lower legs thereof are provided with flanges 11 which lie adjacent the vertical flange 7^b of the angle member 7^a, but are unattached thereto to allow for relative movement. The intermediate portions of the members 9 provide a housing into which the horizontal flange 7^a

of the angle member 7 extends. In this housing above the horizontal flange 7ª there extends a hollow rod 12. At substantially the central portion of this hollow rod 12, there is secured a cam 13 (Figure 6), which is adapted to be operated by the lower end of a lever 14 which is pivoted to a channel member 15 secured to the door. A keeper 16, preferably integral with the channel member spans the outer surface of the lever 14; the lever being pivoted between the channel member 15 and the keeper 16 as shown in Figure 7. The lower end of the lever is provided with laterally projecting cams 14ª which are adapted to be brought into engagement with cam 13 when the lever is swung to one side or the other as shown in Figure 2.

Spaced a suitable distance from the central cam member 13 are cams 17 which are also secured to the rod 12. In the present instance, the cams 17 are shown as riveted to the rod 12 by means of rivets 18, as shown in Figure 5. The cams 17 are substantially of an elliptical form having a major axis and a minor axis. The major axis terminates in cam surfaces 17ª which are adapted for cooperation with the horizontal flange 7ª of the angle member 7 and the upper legs of the U-shaped housing 9, with the result that when the hollow rod 12 is rotated by the coaction of the cam 13 and the lever 14, the cam members 17 are likewise rotated between the horizontal flange 7ª and the upper legs of the housings 9, with the result that the door will be elevated whereby its supporting means 3 will no longer be resting upon the track 2, but on the other hand, will be supported upon the rollers 4. Of course, as soon as the lever 14 is released the door will automatically drop by gravity until it is again supported by the angle bar 3.

From the foregoing, it will be apparent that a very simple and efficient structure has been provided whereby a sliding door may be quickly elevated for rolling movement and, whereby, the door will automatically descend by gravity for frictional engagement with its track as soon as the operator releases the lever 14.

We are aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and we, therefore, do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

We claim as our invention:

1. The combination with a track, of a sliding door having a support for frictionally engaging said track, a pair of guide members on the door, an element slidably confined with respect to said guide members, rollers carried by said element, said element having a horizontal flange, spaced housings upon said door enclosing said flange, a shaft extending through said housings above said flange, a pair of double acting cams upon said shaft, a third cam positioned between said double acting cams, and a lever for actuating said third mentioned cam.

2. The combination with a track, of a door having a support for normally engaging said track for maintaining said door against sliding movements, a pair of rolling elements upon said door, means for supporting said rolling elements for relative vertical movement with respect to the door, said means embodying a horizontal flange, a member on said door extending outwardly above said horizontal flange, and operating mechanism between said flange and member for elevating the door.

3. In a house car having a door opening with a track adjacent one margin of the opening, a sliding door having a support for frictionally engaging said track, a member extending lengthwise of the door and having vertical slidable engagement therewith, rollers carried by said member, said member embodying a horizontal flange, a pair of housings attached to said door and enclosing said horizontal flange, and operating means in said housing for elevating the door above said track.

4. In a house car having a door opening with a track adjacent one margin of said opening, a door having a support for frictionally engaging said track, a roller support attached to said door for relative sliding movement in a vertical direction, rollers secured on said support, said roller support embodying a horizontal flange, housing means enclosing said flange, a shaft extending lengthwise of the door above said horizontal flange, cams secured on said shaft for coaction between said housing means and flange, and means on said door for rotating said shaft.

5. In a house car having a doorway with a track adjacent one margin of the doorway, a door having a support for frictionally engaging said track, a roller support extending in parallel relation to said door, means for confining said roller support for relative vertical movement with respect to said door, rollers carried by said support, said roller support embodying a horizontal flange, a member on said door above said horizontal flange, and rotatable means between said flange and member for elevating the door.

6. In a house car having a door opening with a track adjacent one margin of said opening, a door for closing said opening, said door having means for frictionally engaging said track against sliding movements, a roller support extending in parallel relation with said door, means for slidably confining said roller support, a pair of rollers carried by said support, said support embodying a horizontal flange, spaced housing members at-

tached to said door at one edge and enclosing said flange, the other edge of said housing members being unattached, a shaft extending through said housing members, double acting cams upon said shaft for coaction between said flange and the top of said housing members, a cam secured to said shaft between said housing members, and a lever pivoted to said door for actuating said last mentioned cam for rotating said shaft.

7. In a house car having a doorway with a track adjacent one margin of the doorway, a sliding door for closing said doorway, said door having a support for frictionally engaging said track, a pair of guide members on said door, said guide members having vertical pockets, a roller support having ends slidably engaging said pockets, rollers carried by said support, said support embodying a horizontal flange, a pair of spaced housing members attached to said door and embracing said flange, a shaft extending through said housing members above said horizontal flange, double acting cams secured to said shaft for coaction with said horizontal flange and the upper wall of said housing members, a cam secured to said shaft between said housing members, and a lever pivoted to said door and having parts for operating said last mentioned cam for rotating said shaft for the purpose set forth.

In testimony whereof, we have hereunto subscribed our names at Chicago, Cook County, Illinois.

AXEL WASBERG.
KENNETH J. TOBIN.