Feb. 21, 1933. T. MADLAND 1,898,583

CAR DOOR ELEVATING MECHANISM

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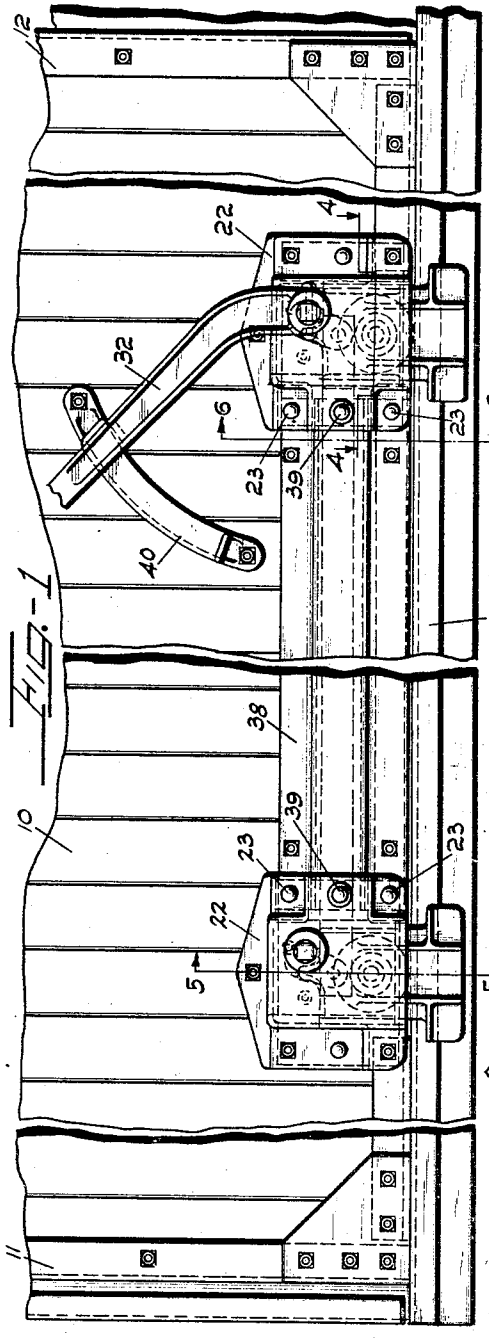


FIG. 1

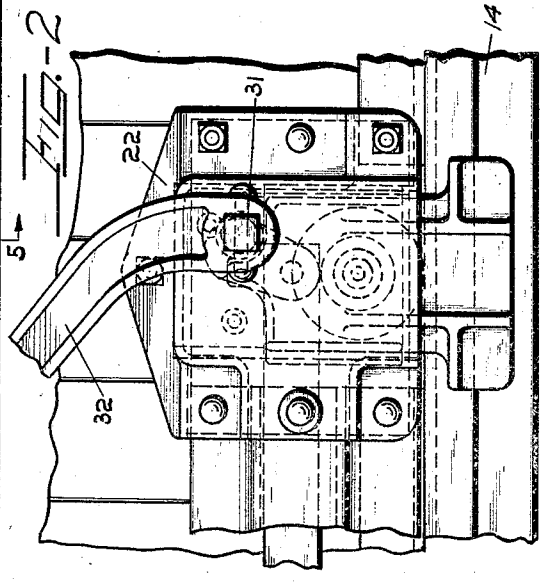


FIG. 2

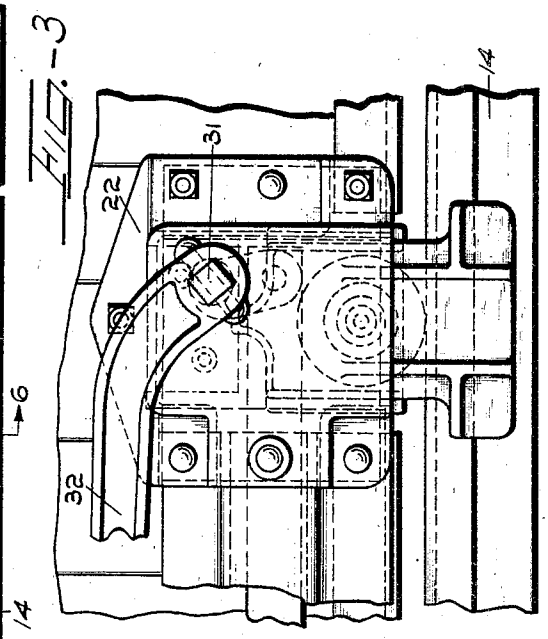


FIG. 3

-INVENTOR-
THORVALD MADLAND

By- Samuel Reese
ATTY.

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CAR DOOR ELEVATING MECHANISM

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FIG-4

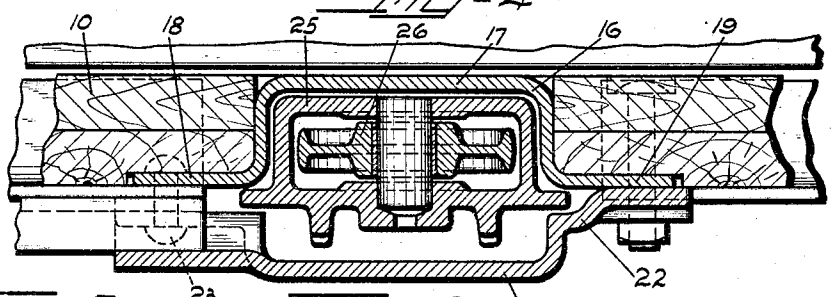


FIG-5

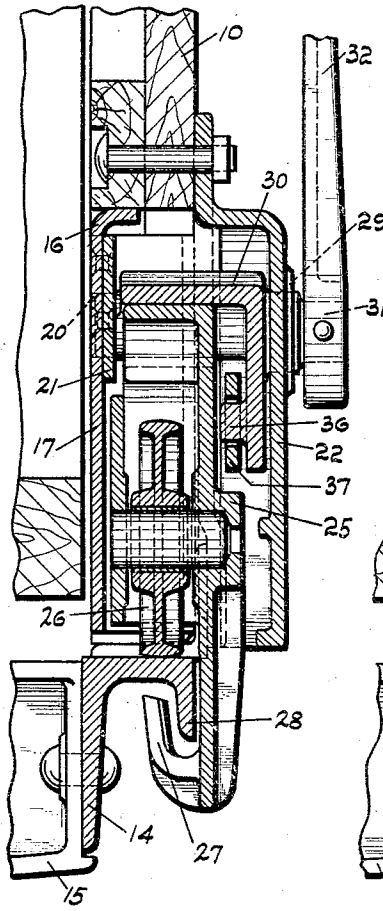


FIG-6

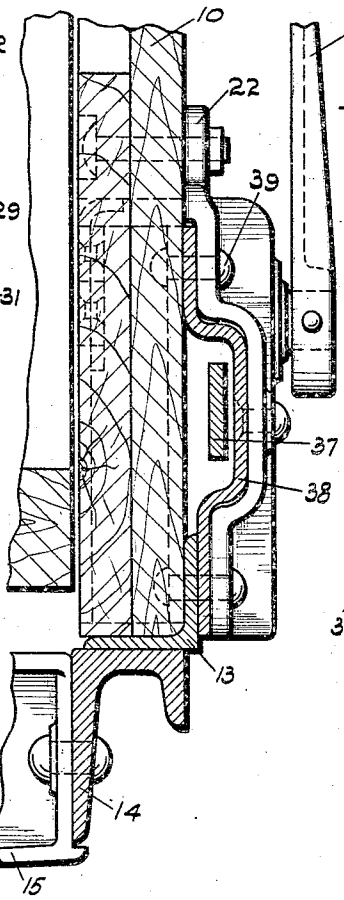


FIG-7

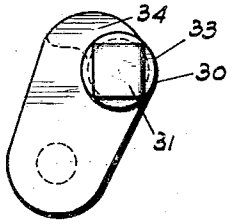
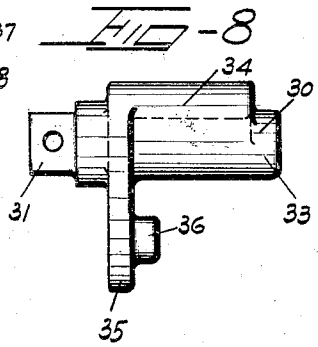


FIG-8



-INVENTOR-
THORVALD MADLAND

By- Samuel Reese
ATTY.

Patented Feb. 21, 1933

1,898,583

UNITED STATES PATENT OFFICE

THORVALD MADLAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO CAMEL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

CAR DOOR ELEVATING MECHANISM

Application filed June 11, 1931. Serial No. 543,551.

This invention relates to elevating mechanism for car doors.

It is an object of this invention to provide an elevating mechanism for car doors capable of being operated with little effort to lift said doors for support upon rolling means for movement toward open and closed positions and which, upon release, permit said doors to gravitate to their normal or lowered position.

With this and other objects in view the invention comprises the novel constructions and combinations hereinafter described and more particularly pointed out and defined in the appended claims.

In the drawings

Figure 1 is a fragmentary elevation including a car door to which is applied an elevating mechanism embodying this invention.

Figure 2 is an enlarged fragmentary elevation showing the right hand portion of the elevating mechanism, the door being in lowered position.

Figure 3 is a view similar to Figure 2, the door being in elevated position.

Figure 4 is a horizontal section taken on line 4—4 of Figure 1.

Figure 5 is a vertical section taken on line 5—5 of Figure 1.

Figure 6 is a vertical section taken on line 6—6 of Figure 1.

Figure 7 is an enlarged end view of one of the operating cams utilized in the elevating mechanism.

Figure 8 is an enlarged elevation of the cam illustrated in Figure 7, looking toward the right in said figure.

For the purpose of illustration the preferred structural embodiment of the invention is shown assembled with a wood door 10. The vertical margins of the door are bound by the angular members 11 and 12, respectively, while the lower margin of the door is bound by the angular member 13. The upper margin of the door (not shown) is also provided with a metallic binding. The invention may, of course, be utilized with doors other than the one illustrated.

In the normal or lowered position of the door it is adapted to be supported frictionally upon a track 14, which is secured in proper position by means of a plurality of track brackets 15, one of which is shown in part in each of Figures 5 and 6 of the drawings. The track brackets are in turn fastened to the side sill (not shown) of the car.

The door is provided with a pair of spaced recesses 16. Positioned in each of these recesses is a backing member 17 having its rear portion preferably flush with the inside surface of the door. The backing member may be secured to the door in any desired manner. In the present embodiment, flanges 18 and 19 are formed on the backing member through which bolts or the like may extend in order to secure said member to the door. The backing member is provided with an opening 20 adapted, as hereinafter set forth, to serve as a bearing for a cam utilized in the elevating mechanism. In order to provide greater bearing surface in the backing member a separate plate 21 is secured thereto and provided with an opening aligned with the opening formed in the backing member.

A cover plate 22, to which the backing member 17 is secured by means of rivets 23, is adapted to be secured to the door by means of the same bolts which secure the backing member to the door.

The cover plate 22 is provided with an outwardly offset portion 24 which, together with the backing member 17, provides a socket adapted for the reception of a roller supporting member 25. The cover plate and the backing member retain the roller supporting member in position for relative vertical movement with respect to the door. Rotatably mounted on the roller supporting member is a roller 26 which preferably is in engagement with the track 14 in all positions of the door. The roller supporting member is provided with an upwardly extending flange 27 adapted to have interengagement with a depending flange 28 formed on the track in order to avoid disengagement of the lower portion of the door from the track.

The cover plate 22 is provided with an opening 29 in alignment with the openings formed in the backing member and the plate 21 secured thereto and, together with said lat-

ter openings, constitute bearings in which a cam 30 is adapted to be journaled. It is observed that the cam extends through the cover plate and is provided with a square shank 31 upon which an operating lever 32 is mounted. The cam 30 embodies a pin or shaft 33 from which extends a finger-like projection 34. The cam is so mounted that the projection or finger 34 lies in engagement with the roller supporting member 25. The cam 30 is, additionally, provided with a depending flange 35 having a projection 36 extending therefrom. Because of the similarity of construction of the backing members, cover plates and cams utilized in the elevating mechanism the above description has been applied to one of each of said backing members, cover plates and cams. It is to be understood, however, that this description is applicable as readily to the other similar members utilized. A bar 37 provided with openings through which the projections 36 of the cams extend is utilized to effect simultaneous movement of the cams. This bar is preferably protected by means of a plate 38 riveted to the backing members and the cover plates by means of rivets 39. The contour of the plate 38 is such as to permit unimpeded movement of the bar 37.

To move the door toward open or closed position the operating lever 32 is grasped and pulled downwardly. The operating lever is guided and retained in this movement by means of the member 40 secured to the door. Movement of the operating lever tends to impart to the cam to which it may be secured a movement of rotation in its bearings. The projection or finger 34 provided on the cam is, however, in engagement with the roller supporting member and in consequence thereof said member serves as a fulcrum for the finger or projection of the cam and effects an elevating movement of that portion of the cam which is journaled in the door. The door, consequently, will be raised and the weight thereof be incident upon the rollers 26. The movement of the cam to which the operating lever is secured is imparted to the other cam by means of the connecting bar 37. When the weight of the door has been placed upon the rollers it may then be moved to any desired position.

Changes and modifications of the structural details of the invention will be apparent to those skilled in the art. All such changes and modifications are deemed to be comprehended within the invention which is to be limited only by the scope of the claims appended hereto.

I claim:

1. In combination, a sliding door, a track adapted to frictionally support said door, a pair of spaced roller supporting members adapted to have relative vertical movement with respect to said door, a roller rotatably supported by each of said members in engagement with said track, a cover plate for each of said supporting members secured to said door, pins extending between and journaled in said door and the respective cover plates, a finger extending from each of said pins and having abutment upon a roller supporting member, a flange depending from each of said pins, a bar connecting said flanges and means for operating one of said pins.

2. In combination, a sliding wooden door provided with a pair of spaced recesses, a track adapted to frictionally support said door in its lowered position, a backing plate positioned in each of said recesses, a cover plate bridging each of said recesses, roller supporting members retained in said recesses for vertical movement relative to said door, a roller rotatably supported by each of said members in engagement with said track, cams journaled in said backing and cover plates in engagement with said roller supporting members, means connecting said cams for simultaneous movement and a lever carried by one of said cams whereby operation of said lever will cause said cams to fulcrum upon said supporting members to elevate the door.

Signed at Chicago, Illinois, this 8th day of June, 1931.

THORVALD MADLAND.