Jan. 20, 1959 C. A. SCHACHT, JR 2,869,637

UPWARDLY ACTING DOOR ASSEMBLY

Filed April 25, 1955

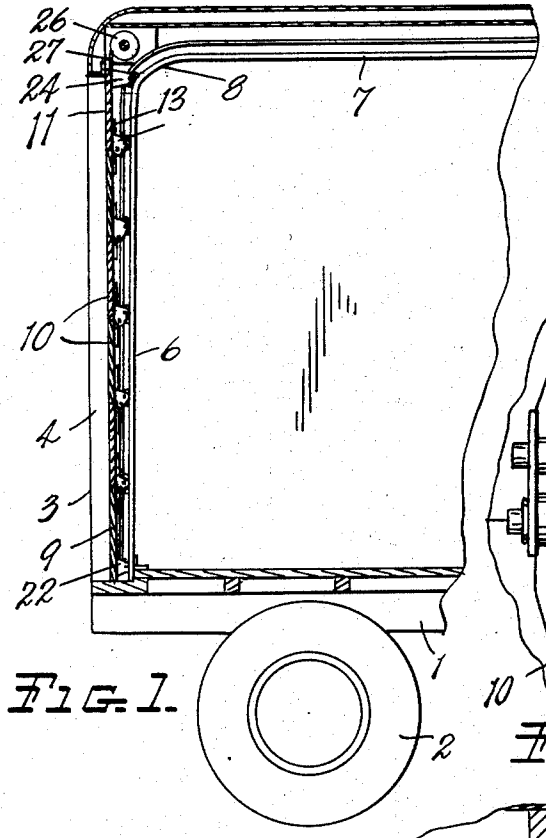


FIG. 1.

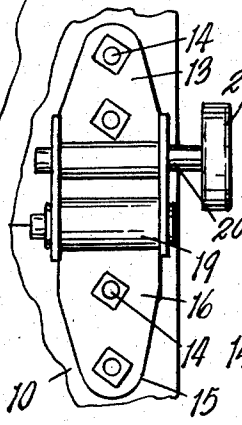


FIG. 5.

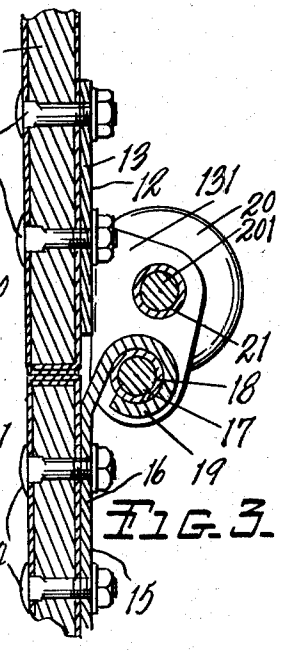


FIG. 3.

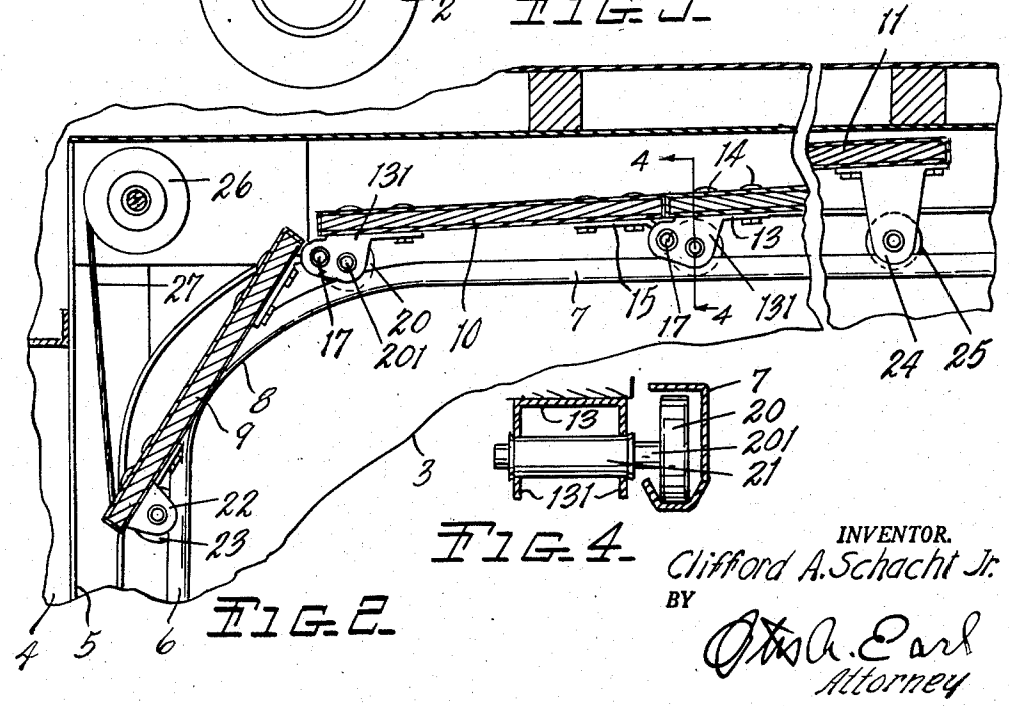


FIG. 2.

FIG. 4.

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United States Patent Office 2,869,637
Patented Jan. 20, 1959

2,869,637

UPWARDLY ACTING DOOR ASSEMBLY

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Application April 25, 1955, Serial No. 503,767

3 Claims. (Cl. 160—201)

This invention relates to upwardly acting door assemblies.

The main objects of this invention are:

First, to provide an upwardly acting door assembly in which the door in the open position may be relatively close to the ceiling.

Second, to provide an upwardly acting door assembly of the multiple section type and comprising a track having a vertical section, a horizontal section, and a curved intermediate section merging into the vertical and horizontal sections, and a door comprising a plurality of hingedly connected sections in which the operation of the door from its closed to open position, and vice versa, is smooth and relatively easy in operation.

Third, to provide a structure having these advantages which is relatively simple and economical in parts and easy to install.

Further objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing in which:

Fig. 1 is a fragmentary longitudinal view in vertical section of a structure embodying my invention, certain parts being shown conventionally. The door being shown in its closed position.

Fig. 2 is an enlarged fragmentary sectional view corresponding to that of Fig. 1 with the door in nearly full opened position.

Fig. 3 is an enlarged fragmentary sectional view illustrating a pair of adjacent door sections or panels and the connecting hinge members therefor, with the track engaging rollers.

Fig. 4 is a detailed section through the track on a line corresponding to line 4—4 of Fig. 2.

Fig. 5 is a fragmentary inside elevational view of one of the door hinge and roller assemblies.

In the accompanying drawing I have illustrated my invention as it is embodied in an upwardly acting door installed in a motor vehicle, although it should be understood that my invention is adapted for use in any relation where it is important to have the door in an open position lie closely adjacent to the roof.

In the accompanying drawing 1 represents the chassis of a motor vehicle and 2 one of the wheels thereof. The vehicle body is designated generally by the numeral 3, and is provided with a rear door opening 4. The door opening is provided with a suitable jamb 5 against which the door closes. The track of the assembly comprises a vertical section 6, a horizontal section 7, and a curved intermediate section 8 merging into the vertical and horizontal sections. The vertical section is desirably rearwardly inclined relative to the door jamb so that when the door is in closed position it is supported against the jamb, and at the same time as the door moves upwardly it clears the jamb to facilitate ease of operation. This feature is old in the art.

The door comprises a plurality of sections or panels

designated 9, 10 and 11; 9 being the lower panel and 11 the upper panel. The intermediate panels are desirably the same in structure. The adjacent edges of the panels are hingedly connected and provided with track engaging rollers. These connections comprise the hinge members designated generally by the numeral 12 and having leaf portions 13 secured to the inner side of the panels on which they are mounted by means of the bolts 14. Coacting hinge members 15 are provided with leaf portions 16 which are secured by the bolts 14. The particular arrangement of these hinged connections relative to the panels is an important factor of my invention.

For convenience in describing and defining the relation of the adjacent pair of panels and their hinge connections, I use the term "upper panel" and "lower panel" which is their relative positions when the door is closed, and in general while the door is being moved from closed to open position and vice versa.

The hinge member 12 is provided with a pair of spaced inwardly projecting flanges 131, the lower ends of which project below the lower edge of the upper panel to which the hinge member is attached.

The pintle 17 is disposed through the projecting ends of the flanges 131 with the center of the pivot in approximately the plane of the lower edge of the upper panel.

The pintle is provided with a bushing 18 disposed between the flanges of the knuckle 19 of the hinge member 15. The knuckle 19 is inwardly offset to engage the pintle which is disposed in a substantially spaced relation to the inner side of the panel.

The track engaging rollers 20 are provided with spindles 201 which are supported by the bearings 21 provided therefor and mounted on the flanges 131.

It will be noted that the axis of the spindle is disposed above the pintle of the hinge and spaced inwardly from the plane thereof. This arrangement results in the very smooth operation of the door as it moves from closed to open position and vice versa, and further results in ease of operation as compared to upwardly acting door structures of this general type. As the door supporting guide rollers pass from the horizontal section of the track to the curved section thereof, or vice versa, the upward edge of the lower panel follows substantially the path of the lower edge of the upper panel, that is it is not projected or raised above the path of travel of the lower edge of the upper section, as has been the case with prior upwardly acting sectional door structures with which the applicant is familiar.

The bottom section 9 of the door is provided with an inwardly projecting bracket 22 for the lower guide roller 23. The top door panel 11 is provided with a bracket 24 for the roller 25, the bracket 24 being of such length as to hold the top door panel against the jamb when the door is fully closed, and the roller 25 is engaged in the lower end of the curved section of the track, as shown in Fig. 1.

The counterbalance drum 26 is provided for the cable 27 which is connected to the bottom section 9 of the door.

The details of this spring torsioned drum are not illustrated as they form no part of the present invention.

It will be noted that in its open position the door lies quite closely to the ceiling or the underside of the roof.

As stated, the result of the structure is that the upper edge of the lower panel does not rise vertically above the curved portion of the track as the lower portion transverses the whole or door portion thereof, and it is found that this renders the operation of the door both in opening and closing very smooth and eliminates the jerking or jumping movement which has been commonly present in the operation of sectional upwardly acting doors of this type.

I have illustrated and described my invention in a highly practical embodiment thereof. I have not attempted to illustrate or describe other embodiments or adaptations as it is believed that this disclosure would enable those skilled in the art to embody or adapt the same as may be desired.

Having thus described the invention what is claimed as new and desired to secure by Letters Patent is:

1. The combination in an upwardly acting door assembly including a track comprising an upright section, a horizontal section and a curved intermediate section merging into said upright and horizontal sections, and a door comprising a plurality of panels, of a first hinge member mounted on the inner side of the lower edge of the upper panel of a pair of adjacent panels considered from the relative position of the panels when the door is closed, said member having a pair of spaced inwardly projecting flanges, the lower ends of which project beyond the lower edge of the upper panel, a pintle disposed through said flanges with its axis in the central plane of the joint between the panels, a second hinge member mounted on the inner side of the lower panel of the pair and provided with an inwardly offset knuckle engaging said pintle on the first hinge member, and a track roller provided with a spindle journaled in said inwardly projecting flanges of said first hinge member and positioned substantially above said pintle so that the upper edge of the lower panel of the pair is not substantially elevated above the track as the track roller traverses from the curved intermediate track section onto the horizontal section, or vice versa.

2. The combination in an upwardly acting door assembly including a track comprising an upright section, a horizontal section and a curved intermediate section merging into said upright and horizontal sections, and a door comprising a plurality of panels, of a first hinge member having a pair of inwardly projecting flanges mounted on the inner side of the lower edge of the upper panel of a pair of adjacent panels considered from the relative position of the panels when the door is closed with the lower ends of the flanges projecting below the lower edge of the panel, a pintle extending between said flanges and disposed in inwardly spaced relation to the plane of the inner side of the upper panel and in the plane of the lower edge thereof, a second hinge member mounted on the inner side of the lower panel and provided with a knuckle engaging the said pintle between said first hinge member

flanges, and a track roller disposed at the outer side of said first hinge member flanges and provided with a spindle, said flanges being provided with a bearing for said spindle extending between the flanges and disposed above and inwardly spaced relative to said pintle whereby the upper edge of the lower panel of the pair is pivotally carried in substantially the path of the lower edge of the upper panel as the track roller travels from the curved intermediate track section onto the horizontal track section, and vice versa.

3. The combination in an upwardly acting door assembly including a track comprising an upright section, a horizontal section and a curved intermediate section merging into said upright and horizontal sections, and a door comprising a plurality of panels, of a first hinge member mounted on the inner side of the lower edge of the upper panel of a pair of adjacent panels considered from the relative position of the panels when the door is closed, said first hinge member having a pintle thereon disposed in inwardly spaced relation to the plane of the inner side of the upper panel and in the plane of the lower edge thereof, a second hinge member mounted on the inner side of the lower panel and provided with a knuckle engaging the said pintle of the first hinge member, and a track roller mounted on said first hinge member with its axis substantially above and inwardly spaced relative to said pintle whereby the upper edge of the lower panel of the pair is not substantially projected above the path of the lower edge of the upper panel as the track roller traverses the curved intermediate track section onto the horizontal track section, and vice versa.

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