

[54] **ROLL-UP DOOR ASSEMBLY FOR VEHICLES**

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[51] Int. Cl. **E05d 15/36**

[58] Field of Search **160/133, 235, 229 R, 201; 16/87 R, 105, 176, 178**

[56]

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[57]

ABSTRACT

A door is formed of a plurality of extruded sections having side opening sockets in the upper and lower edges thereof. These sockets are arranged to receive circular bead portions of side hinge members which hold the door segments together in hinged relation, the bead portions of the hinges being connected by a flat body portion to space adjacent door segments apart and provide ventilation between the segments. The hinges have head portions which in the assembled relation of the door project beyond the side edges of the door and slidably engaged trackways extending vertically from a lower portion and curved into an upper portion. A line operating over pulleys is connected to the door for opening and closing the same, and a latch is provided for holding the door down tightly in a closed position.

2 Claims, 8 Drawing Figures

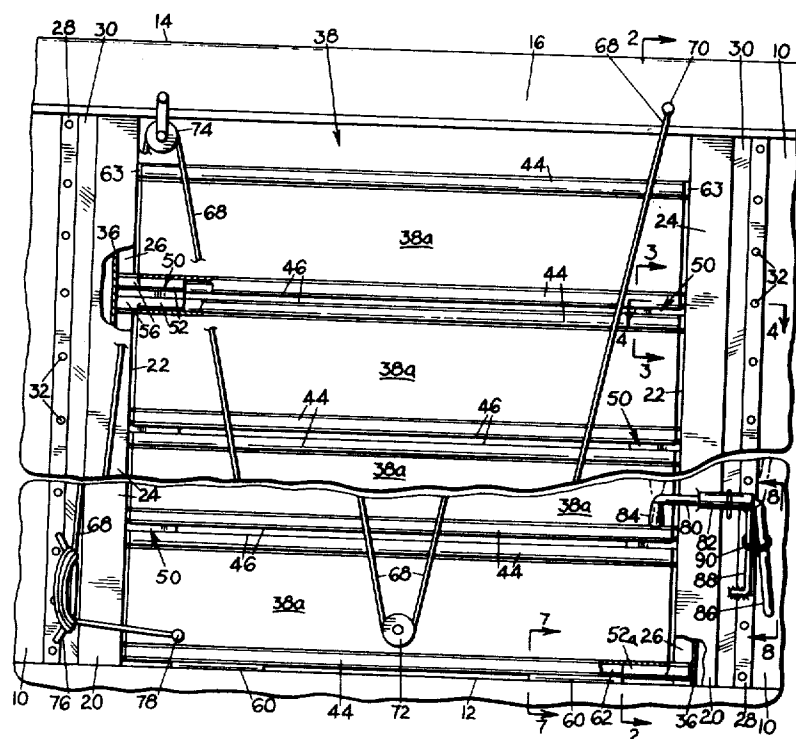


FIG. 1

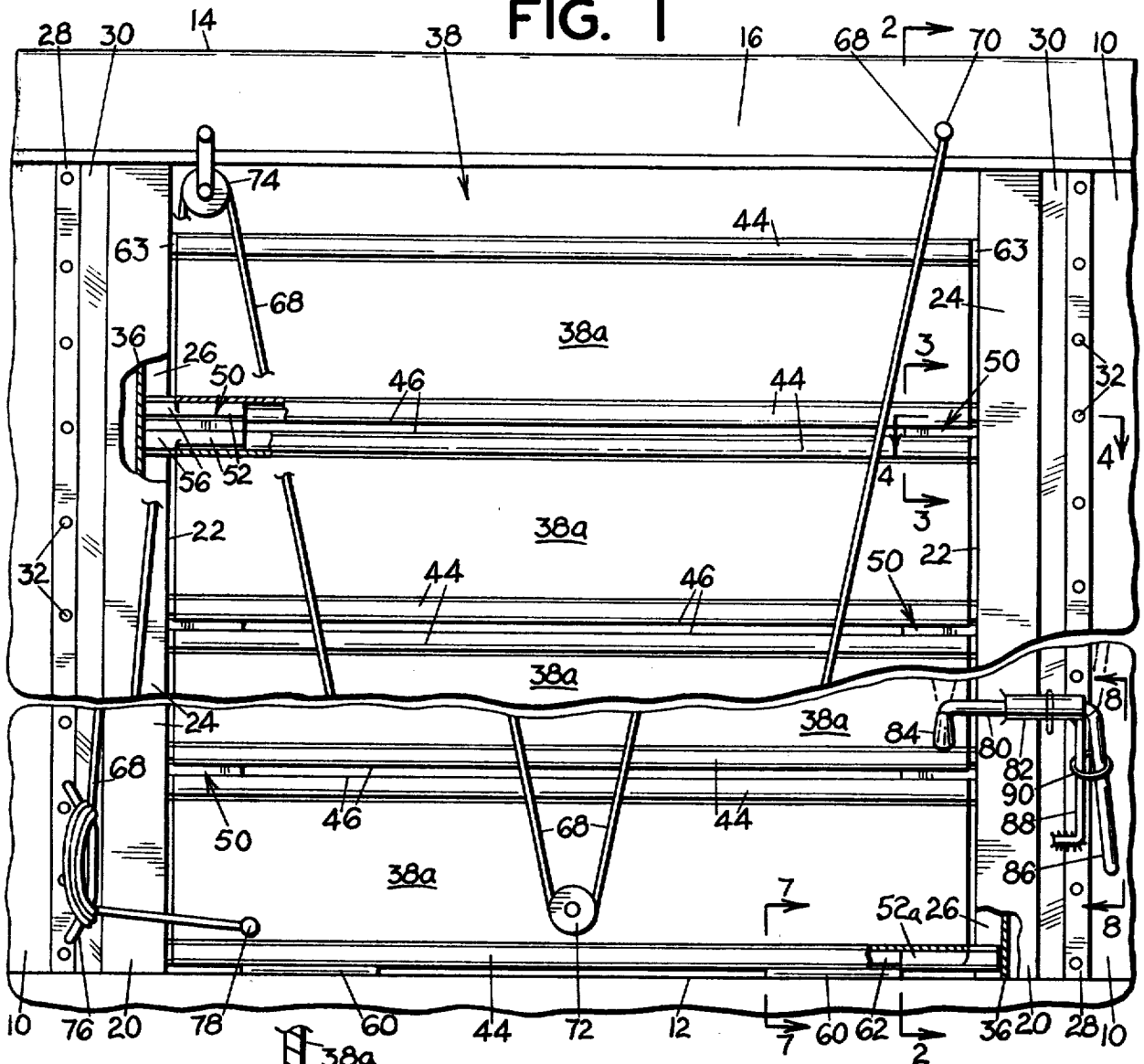


FIG. 7

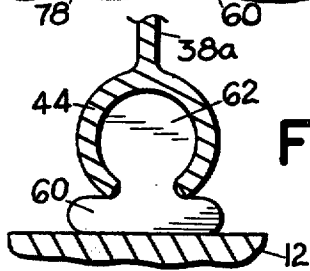
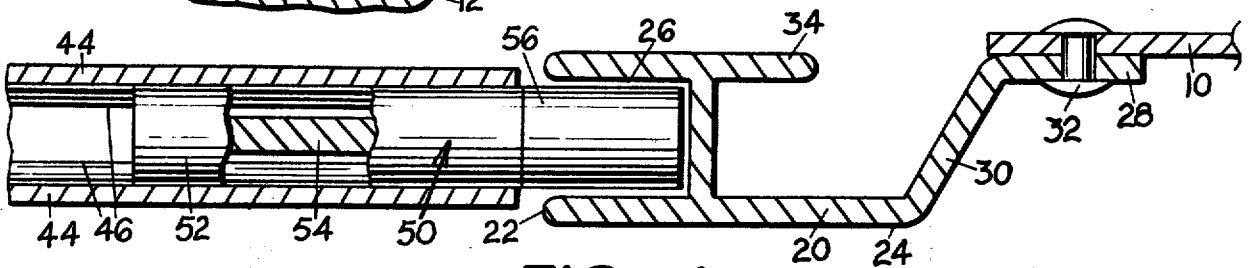


FIG. 4



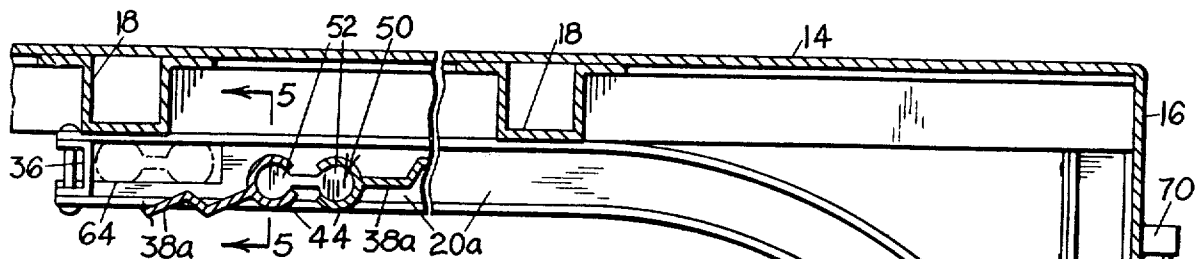


FIG. 2

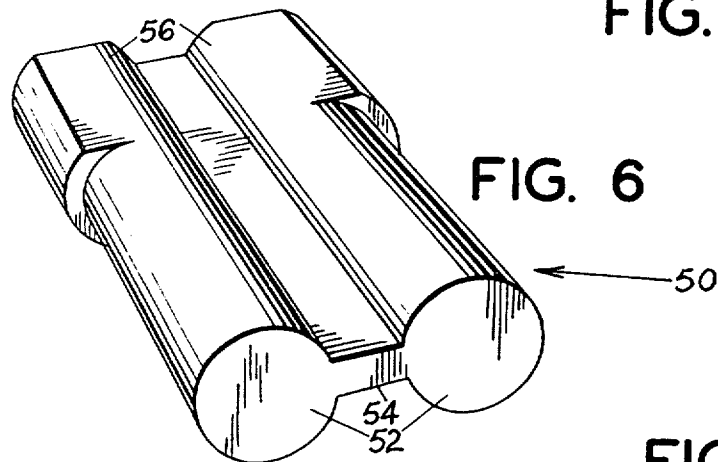


FIG. 6

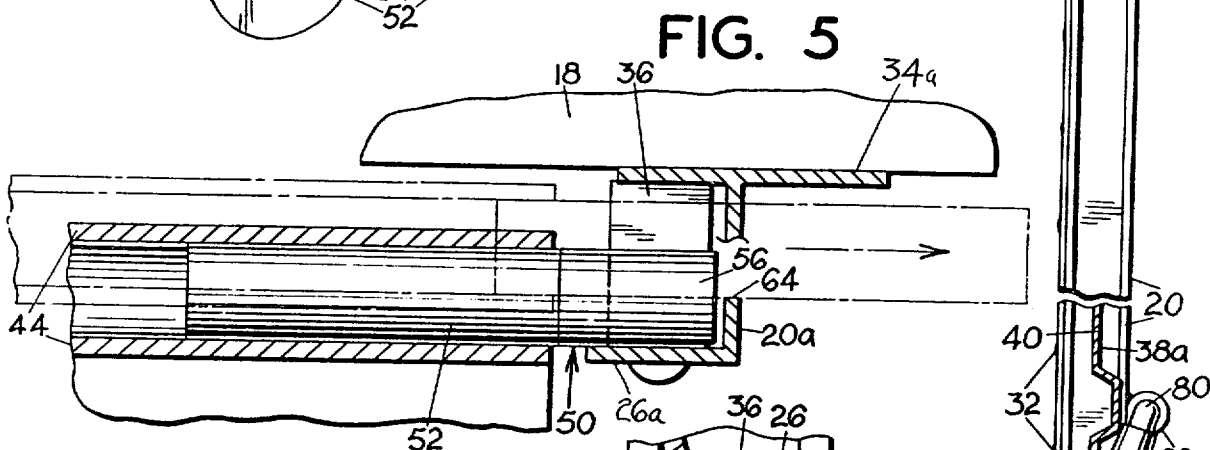


FIG. 5

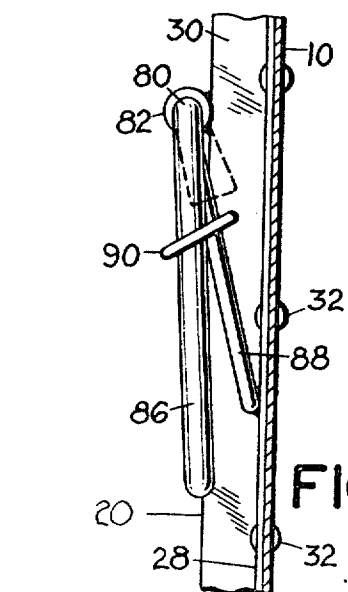
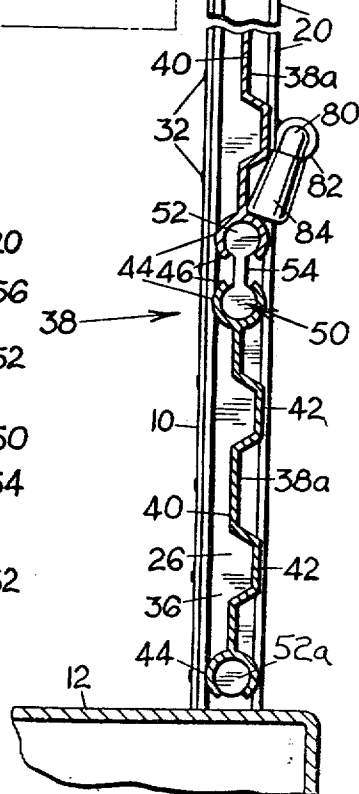
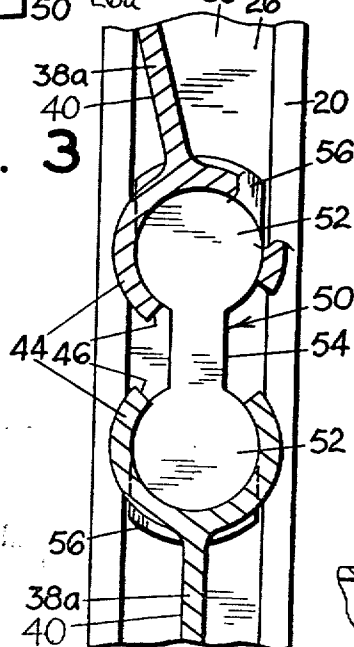


FIG. 8

FIG. 3



ROLL-UP DOOR ASSEMBLY FOR VEHICLES

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in roll-up doors and is particularly concerned with a roll-up door for use on heavy duty vehicles.

Roll-up doors have heretofore been proposed wherein hinge members connect adjacent door segments together. Such hinge members have projecting rollers which engage side tracks to provide the door support. Examples of such roll-up doors are shown in U.S. Pat. Nos. 3,056,451 and 3,148,724. The latter patent utilizes full width hinge members for connecting door segments together. This type of structure has the advantage that it is expensive to manufacture because of the use of end wheels and bearings therefor and also because the hinges extend the full width of the door. Another disadvantage of this type of door is that no spacing for ventilation exists between the door segments.

SUMMARY OF THE INVENTION

According to the present invention, and forming a primary objective thereof, a roll-up door structure is provided which overcomes the disadvantages of the prior art.

More important objects of the present invention are to provide a roll-up door which comprises a plurality of laterally extending segments held together by hinge members, the hinge members having extensions which project beyond the sides of the door and slidably engage the side tracks, thus eliminating the necessity of providing wheels thereon; to provide hinge members which are disposed on each side and which are of short length whereby to allow a vertical space between the door segments to provide ventilation; and to provide a hinge of the type described which due to its structure is simplified in structure, inexpensive to manufacture, and easy to assemble in the door either for initial installation or for maintenance.

Another object is to provide novel latch means for holding a door in a positive closed position.

The invention will be better understood and additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings which illustrate a preferred form of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a foreshortened, fragmentary elevational view of a vehicle wall portion showing the present door installed therein;

FIG. 2 is a vertical sectional view, also foreshortened, taken on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary sectional view taken on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary sectional view taken on the line 4—4 of FIG. 1;

FIG. 5 is an enlarged fragmentary sectional view taken on the line 5—5 of FIG. 2;

FIG. 6 is an enlarged perspective view of a hinge member for the door sections;

FIG. 7 is an enlarged fragmentary sectional view taken on the line 7—7 of FIG. 1; and

FIG. 8 is a side elevational view of a door latch for holding the door shut, this view being taken on the line 8—8 of FIG. 1.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

With particular reference to the drawings, the numeral 10 in FIG. 1 designates a vertical wall portion of a heavy duty vehicle such as a cattle trailer or the like. The numeral 12 designates the bottom wall or floor and the numeral 14, FIG. 2, designates the top wall or ceiling. An extension 16 of the top wall is angled down to overlie a portion of the wall panel 10, and the vehicle has reinforcing frame members 18 in its side and top walls.

The door assembly of the instant invention includes a pair of side tracks 20 secured in integral relation in the vertical wall panel 10 between the bottom and top walls. These tracks are spaced apart to form a door opening 22 therebetween. The door may be provided in any desired wall panel of the vehicle, such as the rear wall panel or a side panel.

The cross sectional shape of the tracks 20 is shown in FIG. 4. Each comprises a body portion 24 having a channel or groove 26 which faces inwardly or in other words toward the other track so as to form a trackway for door supports, to be described. An offset base portion 28 is integral with the body portion 24, by means of an angled extension 30, and is parallel with said body so that when it is secured to a wall panel, as by rivets 32, the lateral facing direction of channel 26 is parallel with such wall. A web 34 on the opposite side of channel 26 from the body portion 24 extends toward the base 28 for reinforcement. In addition to being secured to the wall panel 10, the tracks 20 are secured to the top and bottom of the vehicle, as by welding.

As best seen in FIG. 2, the upper end of track 20 has an inwardly directed portion 20a which curves into a horizontal top portion secured as by welding or riveting to the frame members 18. The cross sectional shape of the track extension 20a is seen in FIG. 5, and comprises a channel 26a which leads from channel 26. The track portion 20a has a web extension 34a for securement, as by welding, to frame members 18. The end of track 20a is closed by a wall 36, FIG. 2, which forms an end abutment for upward movement of the door. Such wall may comprise a channel-shaped member riveted to the track.

The door is designated generally by the numeral 38, FIGS. 1 and 2, and comprises a plurality of extruded sections 38a, the cross sectional shape of which is best shown in FIG. 2. Each of these sections comprises a body portion 40 having channel portions 42 for reinforcement and having a laterally extending tubular enlargement 44 at each of the top and bottom. Each tubular enlargement is open at the sides to form side opening sockets. These enlargements also have longitudinal slots 46 therein located diametrically across from the body portion 40.

Door sections 38a are connected together to form the assembled door by hinge members 50 shown in detail in FIG. 6. These hinge members have a pair of substantially round cylindrical bead portions 52 interconnected integrally by a flat body portion 54. One end of these hinge members 50 has side enlargements to form a head 56 therefor which as will be seen hereinafter engages slidably in the track portions 20 and 20a.

The round bead portions 52 are of selected diameter so as to fit rotatably in the sockets formed by the tubular enlargements 44 of the door sections. FIG. 2, the body portion 54 projecting through the slots 46 of opposed enlargements 44. The door sections are thus held together and are arranged to pivotally or hingedly move relative to each other for assuming the contour of the track as the door moves up and down. It is preferred that the hinge members 50 be constructed of a durable material such as plastic and furthermore that a self-lubricating type plastic such as nylon or the like be used. Thus, the bead portions 52 will provide long lasting hinge connections and the other end, comprising the head 56, will have long lasting sliding engagement in the track portions 20 and 20a.

The structure of the hinge members 50 of applicant accomplishes an important advantage, namely, the body portion 54 thereof between the bead portions 52 causes the door segments to be spaced apart so that ventilation openings are provided in the door between each of the sections. The hinge members 50 extend only a short distance in from the sides of the door and thus allow ventilation between the door sections for almost the whole width of the latter.

The very top and bottom of the door has single bead portions 52a in the enlargements 44 the bottom one of which is shown in FIG. 2, and with reference to FIGS. 1 and 7, foot members 60 are provided in the lowermost tubular enlargement 44 of the door adjacent to the portions 52a. These foot members have a bead portion 62 which fits in the bottom tubular enlargement 44. They are formed of a plastic or the like which has some resilience so as to provide a cushion stop for the door when it seats against the bottom 12 of the vehicle.

With reference to FIGS. 2 and 5, the track portions 20a adjacent to their upper or inner ends are provided with openings 64. The bottom edges of these openings are spaced a short distance above the bottom of channel portions 26a. They have a vertical dimension slightly greater than the thickness of the hinge members 50 at the head 56 and have a longitudinal dimension slightly wider than the head portion of the hinge members. In other words, the vertical and longitudinal dimensions of the openings 64 will allow the hinge members to be moved endwise therethrough, and to install the door, a pair of door sections are held up between the tracks 20a to position the enlargements in lateral alignment with such openings and the hinge members inserted from the sides through said openings. A hinge member is shown in phantom in FIGS. 2 and 5 to illustrate a position at which a hinge is inserted through the opening 64, and in FIG. 2 one door section 38a is shown in an angled position as if it were half installed or half removed. The door can then be moved down the track the length of one section and the next section installed by another pair of hinges being secured thereto in the same manner. The door can be removed in the reverse order or disassembled a selected amount for repair of a section. In the installed position of the door, the end hinge members 50 cannot accidentally be displaced through openings 64 since said openings are disposed above the bottom of the channel 64 and thus out of true lateral alignment with such hinge members.

The door is operated in its up and down movement by a pull cord 68, FIG. 1, connected at one of its ends to an anchor 70 to a top portion of the vehicle. The

cord then passes over a lower pulley 72 secured at a bottom portion of the door. From there the cord extends over an upper pulley 74 secured to a top portion of the vehicle and then to a cleat 76 provided on the wall 10 adjacent to the door for holding surplus cord. The door is opened by pulling down on the end of the cord just above the cleat. The end of the cord from the cleat is preferably connected to an anchor point 78 at a lower portion of the door whereby when the door is up with the line off the cleat, the operator can pull on this end of the line to lower the door.

With references to FIGS. 1 and 8, a latch is provided for holding the door in a tightly closed position so that it will not jump up and down as the vehicle travels on the highway. This latch comprises a rod 80 rotatably supported in a sleeve body portion 82 welded to one of the tracks 20 and having a right angle rubber tip end 84. The latch is selectively mounted on the vehicle such that when the rubber tip 84 is directed downwardly it will engage on top of an enlargement 44 of a door section.

The other end of the rod 80 from the tip end has an angled handle 86. The latch also includes a downwardly extending rod member 88 secured integrally between the sleeve 82 and the vehicle. The handle 86 of the latch is angled outwardly a slight amount relative to rod member 88 and a ring 90 is supported around such handle and the rod. With the diverging relation of rod 88 and the handle 86, such ring in being moved down will tightly grip these two members and prevent the handle from rotating. The latch member 84 is thus held non-rotatably in place. The ring 90 will remain in place by gravity, and to release the latch, it is merely necessary for the operator to move the ring upwardly an amount sufficient to allow the handle 86 to rotate and move the rubber end 84 out of engagement with the tubular enlargement 44 of the door. A released position of the latch is shown in phantom lines in FIG. 1.

According to the present invention, a door structure is provided which due to its sectional construction and its hinge support provides an efficiently operating structure and one which is simplified and inexpensive to manufacture. The self lubricating hinge members 50 provide for long life and furthermore since these hinges are disposed only at the ends of the door and employ the spacing body portions 54 between the connecting bead portions 52, the door provides ventilation there-through.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A roll-up door assembly for vehicles comprising
 - a. a pair of spaced apart track members extending upright through a portion of their length and at their upper ends extending into a curved portion,
 - b. said track members having opposed channel portions forming trackways,
 - c. a door having top and bottom ends and side edges,
 - d. said door comprising a plurality of individual horizontal sections each having top and bottom laterally extending tubular portions,
 - e. said tubular portions being open at the side edges thereof.

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- f. said top tubular portions having a top longitudinal slot therein and said bottom tubular portions having a bottom longitudinal slot therein,
- g. and a plurality of hinge members,
- h. said hinge members comprising a one-piece molded construction having a flat body portion and a pair of parallel cylindrical portions along opposite sides thereof,
- i. said cylindrical portions being engaged rotatably in top and bottom tubular portions of adjacent door sections through the side edge openings of said tubular sections with said body portion projecting through said slots whereby to connect said door sections hingedly together for movement in the track members,
- j. and a head portion on the other end of each of said cylindrical portions,
- k. said head portions projecting beyond the side edges of the door sections in the engaged position of said hinge members in said tubular portions of adjacent door sections and extending freely and slidably into the channel portion of said track members for guiding and supporting said door sections in said track members,

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- l. the door being of a selected width and said head portions projecting a selected amount relative to the distance between said track members whereby the door is maintained against lateral displacing movement in said track members,
 - m. the body member of said hinge members having a width such that the interconnected door sections are spaced apart to form a vertical air space therebetween,
 - n. said hinge members being of a length to extend only part way through the width of the door sections from the sides whereby said air spaces are provided throughout a major portion of the width of said door.
2. The door assembly of claim 1 wherein said channel portions of the track members have side walls and said side walls have openings at least as large as said head portions to provide lateral installation and removal of the hinge members in the installation and removal of the door in the track members, said openings being disposed above the normal path of travel of said head members whereby said hinge members and door sections must be elevated for installation and removal.

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