United States Patent

Andresen

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[54] **ASSEMBLED OVERHEAD DOOR UNIT**

[72] Inventor: **Donald D. Andresen,** 10380 W. Whitesbridge Ave, Fresno, Calif. 93706

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[52] **U.S. Cl.** .....**49/206,** 49/197, 49/380, 206/60 R

[51] **Int. Cl.** **E05d 15/40**

[58] **Field of Search** ..160/199, 201, 206, 40; 49/197, 49/198, 199, 200, 206, 380; 206/60 R, 60 A

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Primary Examiner—Dennis L. Taylor

[57] **ABSTRACT**

An assembled overhead door unit for hanging from a door frame defining a doorway and including a door panel having respective door mounting brackets secured to opposite sides thereof. First and second pairs of hinge arms are pivotably connected on their respective lower ends to the respective mounting brackets and project upwardly therefrom. A pair of frame mounting brackets are pivotably carried from the upper extremities of the respective hinge arms and respective tension springs are provided for connection between the respective hinge and door brackets for biasing such brackets toward one another. Connecting means is provided for releasably connecting the hinge and door brackets together in affixed relationship whereby the door unit may be positioned in such doorway, the frame brackets mounted to the door frame and the connecting means then released to free the door unit for operation.

7 Claims, 5 Drawing Figures

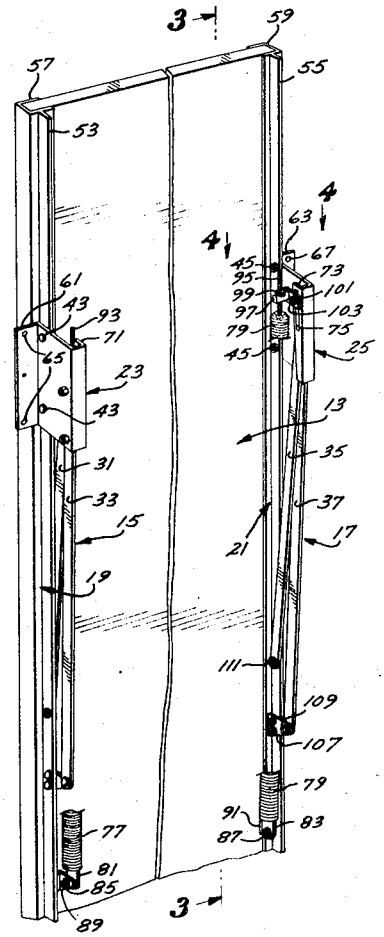


FIG. 1

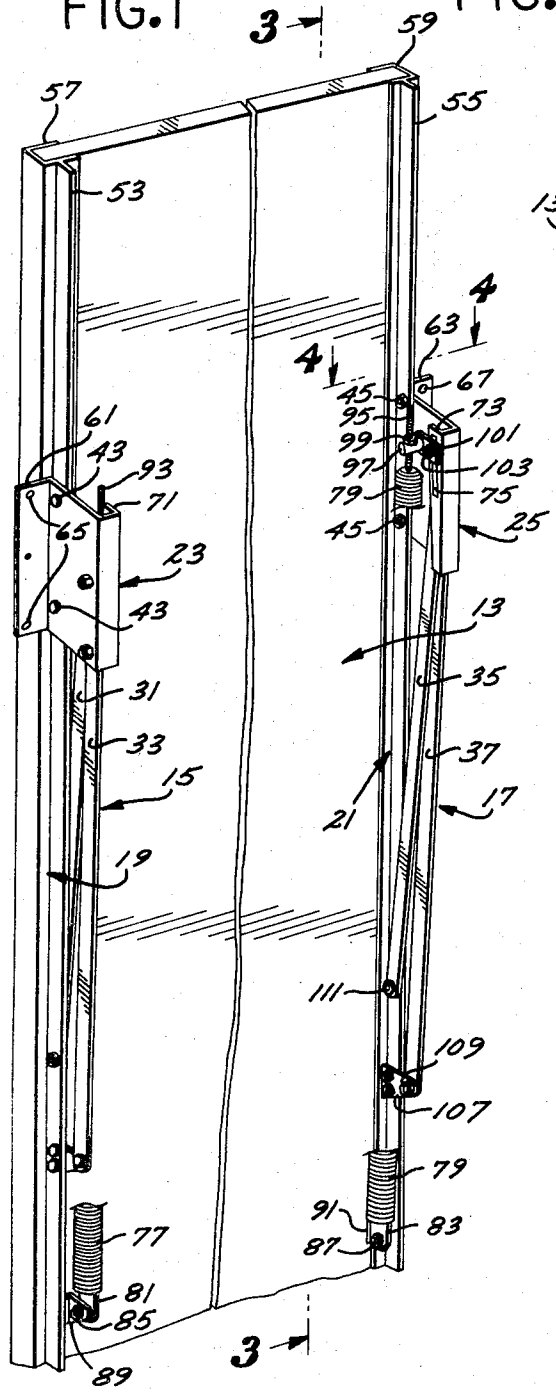
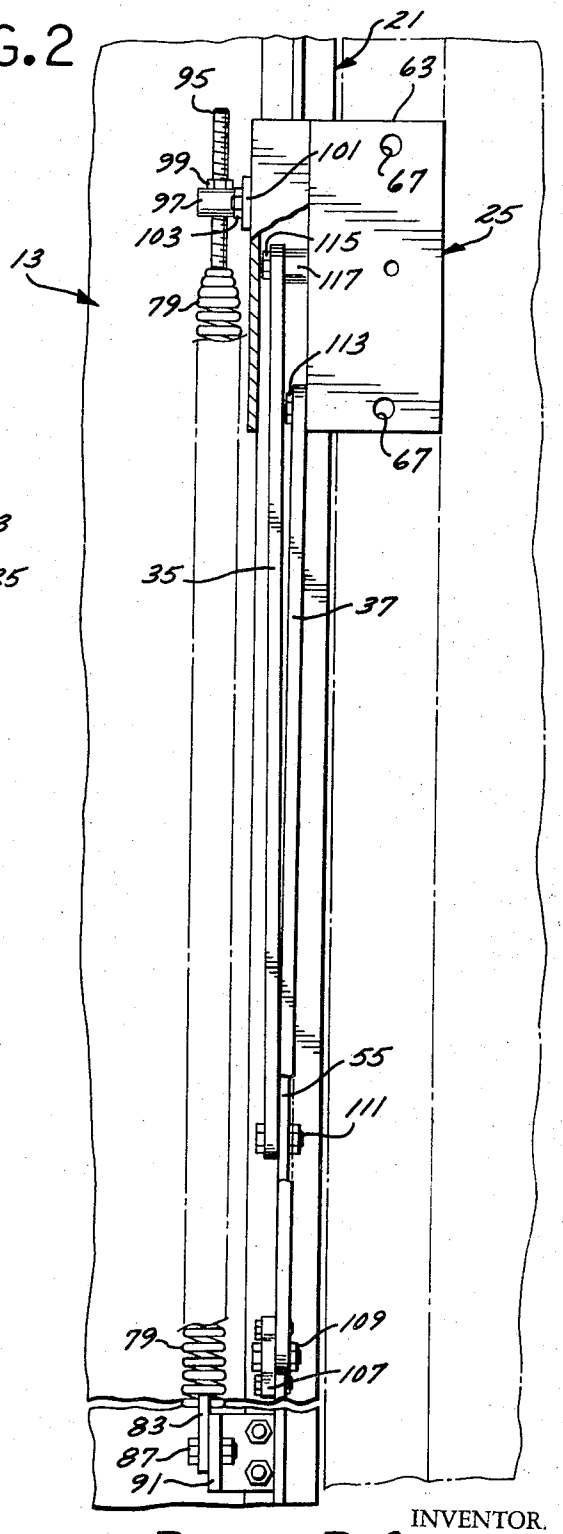


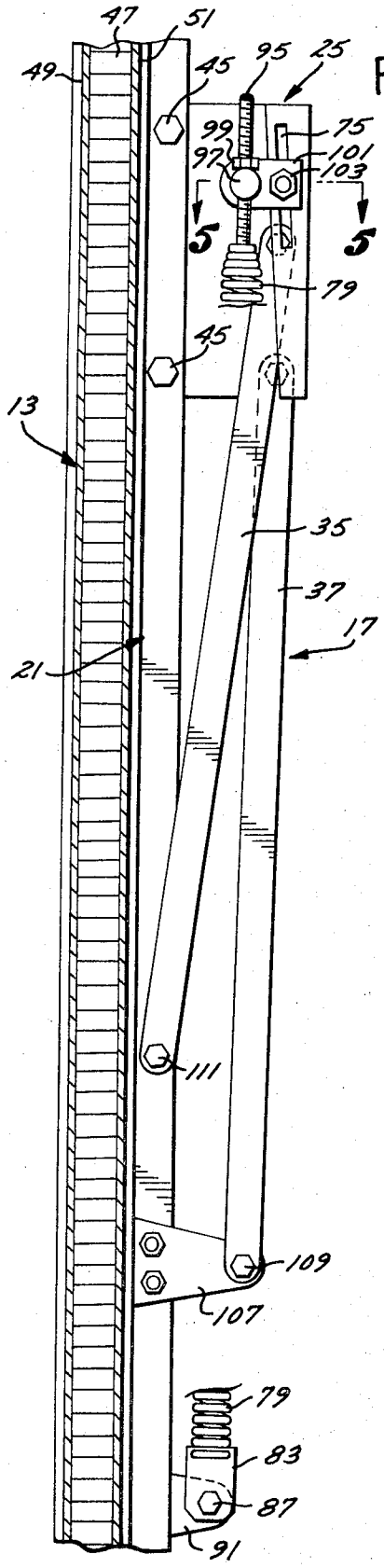
FIG. 2



INVENTOR.
DONALD D. ANDRESEN

BY Fulwider, Patton, Rieber, Lee and Utecht
ATTORNEYS

FIG.3



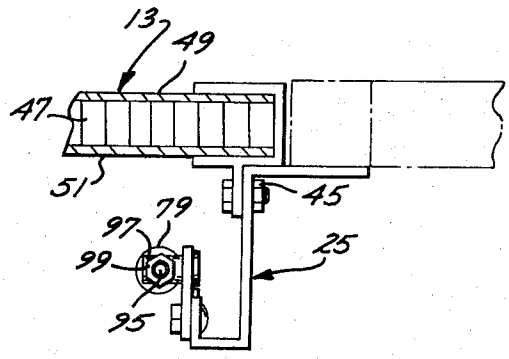


FIG.4

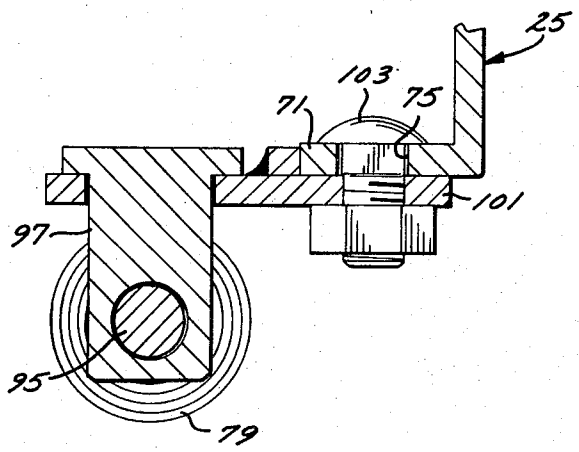


FIG.5

INVENTOR.
DONALD D. ANDRESEN
BY Fulwider, Patton, Rieber, Lee and Utecht
ATTORNEYS

ASSEMBLED OVERHEAD DOOR UNIT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to overhead doors and particularly to an overhead door unit which includes hinges mounted thereon whereby the entire unit may be installed directly on a door frame.

2. Description of the Prior Art

Numerous different types of overhead doors have been proposed and such doors frequently include hinge devices formed by a modified articulated parallelogram for enabling the door to be raised from its vertical doorway-closing position to an overhead position to cause the hinges to pass over center in a manner to cause the door to be balanced rearwardly in an overhead position to maintain such door in its open position. However, such prior art doors suffer the shortcoming that the hinges disposed on opposite sides thereof are each made up of respective door and frame mounting brackets which are connected together by a pair of pivotable arms and the door brackets must be mounted from the door and the frame brackets then mounted from the frame and the pivotable arms then connected with such door and frame brackets thus necessitating installation by a person having a relatively high degree of skill and requiring a substantial amount of time for installation.

SUMMARY OF THE INVENTION

The assembled overhead door unit of present invention is characterized by a door panel having overhead door hinges carried from the opposite sides thereof with each hinge including a door mounting bracket secured to the door and pivotably connected with a frame mounting bracket by means of a pair of rigid arms. The door and frame mounting bracket of each hinge has a tension spring connected therebetween for biasing such brackets together. Releasable connecting means connect the respective door and frame brackets together to hold such hinges in the door-closed pOsition so the unit may be conveniently placed in a doorway in the desired position and the frame mounting brackets secured to the doorway frame and the connecting means then released to free the unit for operation.

The objects and advantages of the present invention will become apparent from a consideration of the following detailed description when taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a broken perspective view of an assembled overhead door unit embodying the present invention;

FIG. 2 is a front view, in enlarged scale and partially broken away, of the assembled overhead door unit shown in FIG. 1;

FIG. 3 is a vertical sectional view, in enlarged scale, taken along the lines 3—3 of FIG. 1;

FIG. 4 is a horizontal sectional view, in enlarged scale, taken along the line 4—4 of FIG. 1; and

FIG. 5 is a horizontal sectional view, in enlarged scale, taken along the line 5—5 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 3, the assembled overhead doOr unit of present invention includes, generally, a door panel 13 having hinge devices 15 and 17 carried from the opposite sides thereof. The hinge devices 15 and 17 include respective door mounting brackets 19 and 21 which have respective frame mounting brackets 23 and 25 carried therefrom by means of respective pairs of rigid arms 31, 33, 35 and 37, such arms being pivotably connected on their opposite ends to the respective mounting brackets. The hinge devices 15 and 17 are secured in their closed position by respective pairs of bolt and nut assemblies 43 and 45 to thereby maintain the frame brackets 23 and 25 in position for being mounted to the doorway frame while the door panel 13 is held in the desired position. Consequently the entire assembled overhead door unit may be positioned in the doorway and the frame mounting brackets 23 and 25 secured to the frame and the connecting bolt assemblies 43 and 45 then removed to free the door 13 for opening and closing.

The door panel 13 is preferably of honeycomb construction and includes a honeycomb core 47 (FIG. 3) that is sandwiched between stiffening walls 49 and 51.

The door mounting brackets 19 and 21 are preferably in the form of webs 53 and 55 projecting from the back side of respective C-channels 57 and 59. The C-channels 57 and 59 open inwardly to receive the opposite marginal edges of the door panel 13. The webs 53 and 55 project the full length of the respective channels 57 and 59 thereby providing for convenient extrusion of the respective integral door mounting brackets 19 and 21. It is important that the honeycomb door panel 13 may be selected of any desired width and assembled between the confronting C-channels 57 and 59 thereby enabling convenient accommodation of any conventional width doorway.

Referring to FIG. 1, the frame mounting brackets 23 and 25 are in the form of sheet metal which is bent outwardly to form respective door jamb mounting plates 61 and 63 having respective lag screw-receiving bores 65 and 67 therein. The respective frame mounting brackets 23 and 25 projected rearwardly from the respective jamb plates 61 and 63 are then turned inwardly and finally are bent back on themselves to form respective flanges 71 and 73, in which adjustment slots 75 (FIG. 1) are formed. The adjustment slots 75 angle outwardly and downwardly to facilitate adjustment of tension on the respective hinge units 15 and 17.

Elongated tension springs 77 and 79 are provided for urging the lower extremities of the door mounting brackets 19 and 21 upwardly toward the frame mounting brackets 23 and 25 and such springs include respective clamps 81 and 83 on their lower extremities which clamp over the opposite sides of the first convolution of spring and are formed with respective bores for receipt of mounting nut and bolt assemblies 85 and 87 which secure the lower extremities of the respective springs to respective mounting ears 89 and 91 projecting from the door mounting brackets 19 and 21.

The upper extremities of the respective tension springs 77 and 79 are conically shaped and converge inwardly to connect with respective adjustment studs

93 and 95 which telescope through bores in respective coupling fittings 97 and have respective hex nuts 99 screwed onto the upper extremities thereof for longitudinal adjustment of the tension in such springs. The respective coupling fittings 97 are carried from the respective one ends of respective arms 101, which arms are secured on their opposite ends to carriage bolt assemblies 103 (FIG. 5) that slide upwardly and downwardly in the respective adjustment slots 75.

Referring to FIGS. 1 and 3, the lower extremity of the hinge arm 37 is carried from a mounting plate 107 secured to the inside of the web 55 by means of a pivot nut and bolt assembly 109. The lower end of the hinge arm 35 is also secured to the inside of the web 55 by means of a pivot nut and bolt assembly 111.

Referring to FIG. 2, the upper extremity of the hinge arm 37 is secured to the frame bracket 25 by means of a pivot nut and bolt assembly 113. The hinge arm 35 angles upwardly and outwardly (FIG. 2) to clear the arm 37 and the upper extremity thereof is pivotably connected to the frame bracket 25 by means of a pivot nut and bolt assembly 115, such arm 35 being spaced from the frame bracket 25 by means of a spacer 117 so such arm will clear the lower arm 37 during opening and closing of the door panel 13 without the necessity of forming an offset in one or the other of the arms 35 and 37.

In operation, the assembled overhead door unit of present invention will be assembled at the place of manufacture with the honeycomb panel 13 being selected for the width of door specified. For wider doorways, the honeycomb panels 13 may be made up of a series of modules which may be disassembled for convenient shipping. The channels 57 and 59 of the respective door mounting brackets 19 and 21 are fitted over the marginal edges of the honeycomb panel 13 and are bonded in place. The hinge devices 15 and 17 are assembled and the connecting bolt assemblies 43 and 45 are inserted to connect the frame mounting brackets 23 and 25 to respective door mounting brackets 19 and 21. If desired the springs 77 and 79 may be adjusted to the desired tension by screwing the nuts 99 inwardly or outwardly on the respective adjustment studs 95. In practice, the carriage bolt assemblies 103 may be loosened to slide the adjustment arms 101 upwardly or downwardly in the vertically extending slots 75 to move the coupling fittings 97 to the desired vertical location and, concurrently, moving such adjustment fittings inwardly and outwardly to the desired transverse position for proper operation of the hinge devices 15 and 17.

With the door unit assembled in this manner, it may be conveniently packaged and shipped to the site for installation and the workmen on the site need only position the door panels 13 in the doorway and insert wedges or the like therearound to obtain the positioning desired and, while the door is held in such position, a drill bit may be inserted through the respective lag screw-receiving bores 75 and 67 in the respective frame mounting brackets 23 and 25 to drill holes in the door frame for receipt of the leg screws for mounting of such brackets. The lag screws may then be inserted and tightened down to secure the frame brackets 23 and 25 in the exact desired position. It should be noted that spacers may be provided between the respective frame mounting brackets 23 and 25 and the webs 53 and 55 of the door mounting brackets 19 and 21 to position the frame mounting brackets 23 and 25 further outwardly if so desired.

With the frame mounting brackets 23 and 25 firmly mounted on the doorway frame, the connecting nut and bolt assemblies 43 and 45 may easily be removed to free the door mounting brackets 19 and 21 from such frame mounting brackets 23 and 25 thereby freeing the unit for operation.

It will be realized that the tension of the springs 77 and 79 will urge the lower extremity of the door panel 13 upwardly to bring such lower extremity upwardly in an over-the-center type action as the lower extremity of the door panel is swung outwardly and lifted upwardly to thereby urge such door panel to its horizontal overhead position. Any time the tension on the springs 77 or 79 needs adjustment, such adjustment can easily be obtained by merely screwing the nuts 99 inwardly or outwardly on the respective studs 95. Further, if desired, the tension springs 77 and 79 may be installed with the adjustment studs 95 projecting downwardly for conVenient access at the lower end of the hinge units 15 and 17.

From the foregoing it will be apparent that the assembled overhead door unit of present invention provides an economical and convenient means for manufacturing an overhead door unit which may be shipped to the construction site and may conveniently and rapidly be installed by workmen located at such site thereby eliminating a substantial amount of installation time and necessitating only a relatively low degree of skill for such installation.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the present invention.

I claim:

1. An assembled overhead door unit for hanging from a door frame defining a doorway and comprising:
- door panel means;
- first and second mounting bracket means secured to opposite sides of said door panel;
- first and second pairs of hinge arms disposed on opposite sides of said door and pivotally attached on their respective lower ends to said respective door mounting bracket means at points spaced therealong and projecting upwardly therefrom;
- first and second frame mounting bracket means having the upper ends of said respective pairs of arms pivotally connected thereto at points spaced therealong;
- first and second tension spring means connected on their respective upper ends with said first and second frame mounting bracket means and on their lower ends with said first and second door mounting bracket means; and
- connecting means connecting said first and second frame mounting bracket means and said first and second door mounting bracket means together whereby said door unit may be placed in said doorway, said frame mounting bracket means secured to said frame and said connecting means released.

2. An assembled overhead door unit as set forth in claim 1 wherein:

said arms are straight and each arm of said first and second pair is disposed in a different plane so the arms of each said pair will clear one another when said door unit is opened and closed.

3. An assembled overhead door unit as set forth in claim 1 wherein:

said door panel is constructed of honeycomb paneling and said unit includes inwardly facing channel members disposed on opposite sides of said panel and receiving the marginal edges thereof.

4. An assembled overhead door unit as set forth in claim 1 that includes:

first and second adjustment means connected with one end of said respective first and second spring means for adjusting the tension thereof.

5. An assembled overhead door unit as set forth in claim 1 that includes:

adjustment means connected with the respective one ends of said first and second spring means for adjusting the transverse position of said respective one ends.

6. An assembled overhead door unit as set forth in claim 2 that includes:

first and second mounting plates mounted on one side of said respective first and second door mounting bracket means and projecting therefrom and having the lower ends of one arm of said first and second pair of arms connected therewith and wherein:

the respective other arms of said respective pairs angle outwardly from the lower ends thereof to clear the said one arms and said arm includes;

spacer means interposed between said respective frame mounting bracket means and the upper end of said respective other arms of said pairs of arms.

7. An assembled overhead door unit as set forth in claim 3 wherein:

said respective door mounting bracket means are in the form of respective webs formed integrally with said channels and projecting therefrom.

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