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OVERHEAD DOOR CONSTRUCTION

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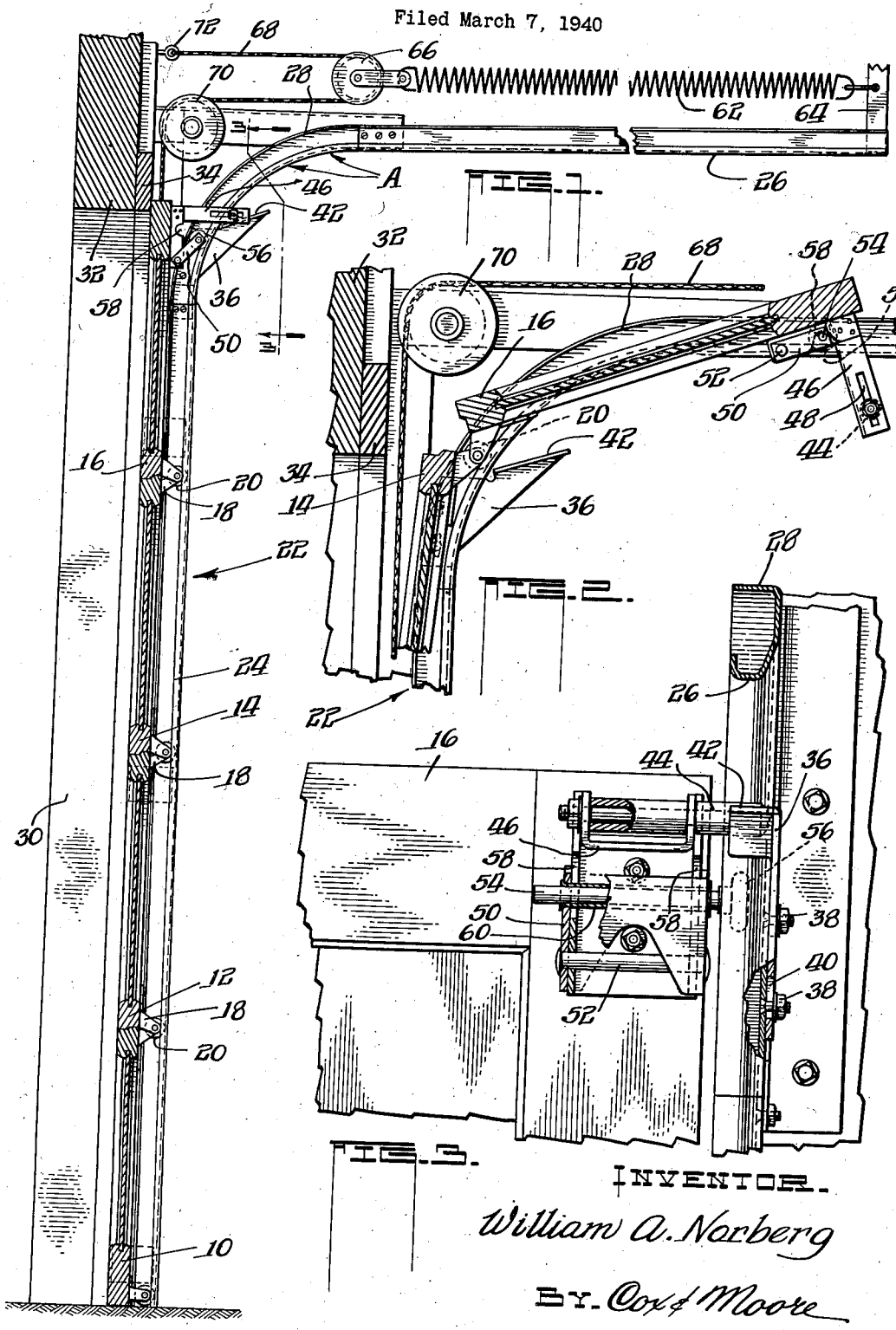


FIG. 1.

FIG. 2.

FIG. 3.

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OVERHEAD DOOR CONSTRUCTION

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6 Claims. (Cl. 20—20)

This invention relates generally to overhead door constructions and more particularly to improvements in overhead door constructions equipped with means for insuring the closing of the uppermost door panel as the panels approach vertical door closing position.

Due to the presence of the curved track section in the vicinity of the upper section of the door frame, some difficulty has been experienced in sealing the uppermost door panel against the door jamb. The present invention contemplates the provision of means whereby the automatic and effective sealing engagement of the uppermost door panel with the complementary section of the door jamb is insured.

More specifically, the invention contemplates the provision of simple and inexpensive panel closing members for causing the above mentioned sealing operation, one portion of the mechanism being carried by and movable as a unit with the uppermost door panel and the other portion being secured in a fixed position, said parts being engageable as an incident to the shifting of the door panels.

It is an object of the present invention to provide a panel closing mechanism of the type set forth above which may be applied to present overhead door installations without necessitating elongation or extension of the upper horizontal track sections or any reorganization or reconstruction of conventional overhead door hardware.

The foregoing and other objects and advantages will be more apparent from the following detailed description when considered with the accompanying drawing, wherein—

Fig. 1 is a vertical sectional view taken centrally of a doorway and associated overhead door construction embodying features of the present invention;

Fig. 2 is an enlarged vertical sectional view of the upper left-hand portion of Fig. 1 disclosing the position occupied by the uppermost door panel as it is about to shift along the curved section of the track; and

Fig. 3 is an enlarged fragmentary sectional view taken substantially along the line 3—3 of Fig. 1, portions of the structure being broken away to disclose parts otherwise hidden.

Referring now to the drawing wherein like numerals have been employed to designate similar parts throughout the various figures, it will be seen that my invention contemplates an overhead door construction wherein a plurality of door panels 10, 12, 14 and 16 are adapted to be shifted between an open overhead position and the vertical door closing position shown in Fig. 1. Suitable hinges 18 carry rollers 20 which are guided by a track structure designated generally by the numeral 22. This track structure includes a vertical track section 24, a substantially horizontal or overhead section 26 and an intermediate or connecting curved section 28. When the door panels 10–16 occupy the vertical position shown in Fig. 1 they serve to close a doorway or opening 30 which is defined by a door frame structure 32. In this position the door panels are sealed against the door jamb 34.

One of the problems which has confronted overhead door manufacturers is that of properly sealing the upper or top door panel against the door jam without necessitating an excessive amount of head room. It will be apparent that as the uppermost door panel is swung between open overhead position and closed vertical position there is a tendency for the upper margin of the panel to swing or move upwardly unless some control or guiding means is provided therefor. The present invention contemplates mechanism whereby this movement of the uppermost panel along the curved track section may be accomplished with a minimum amount of head room and in such a manner as to positively insure the sealing of this door panel against the door jamb as the panels approach their vertical door closing position. This mechanism includes a fixed abutment member 36, which is adjustably secured to the outside of the curved track section 28 by means of suitable bolts or screws 38. In Fig. 3 a portion of the curved track section 28 and the abutment member 36 are broken away to more clearly illustrate the slots 40 in the abutment member which cooperate with the bolts 38 in enabling the adjustable positioning of said member. The upper portion of the abutment member 36 is formed with a flange abutment portion 42 which is slightly inclined with respect to the horizontal, as clearly illustrated in the drawing. This flange or inclined abutment portion 42 is so positioned that as the upper door panel 16 approaches its door closing position, a pin or sleeve 44 on a bracket 46 carried by and extending normally to the door panel 16 moves into engagement with said flange. The co-action between the pin 44 and the flange 42 is such as to cause the uppermost door panel to be positively swung into sealing engagement with the door jamb 34 so as to occupy the position shown in Fig. 1. The

bracket 46 is slotted at 48 so as to provide for adjustment of the pin 44 within said bracket.

The bracket structure 46 also carries an arm 50 which is pivoted at 52. A pintle 54 is carried at the free extremity of the arm 50, one end of said pintle supporting a roller 56. This roller 56 is guided within the track 22 and cooperates with the bracket 46 in supporting the uppermost door panel 16 when said panel is positioned in the upper or horizontal track section as clearly indicated in Fig. 2. When the door panel occupies the position shown in Fig. 2, the arm 50 is in substantial parallelism with the panel and the pintle or pin 54 rests within a recess or cutout 58 (see Figs. 1 and 2). It will be noted in Fig. 3 that the pin or pintle 54 is preferably mounted within a sleeve 60.

From the foregoing description it will be apparent that the mechanism just described for controlling the lateral shifting of the uppermost door panel 16 serves as an effective means for positively insuring the sealing engagement of said panel with the door jamb as the panels approach the limit of their door closing or vertical position and also serves to initiate rearward or inward tilting of the uppermost panel 16 the instant that the door panels are urged upwardly. That is to say, as the door panels are initially shifted in an upward direction the uppermost panel is caused to tilt rearwardly due to the engagement of the sleeve or pin 44 with the under side A of the curved track section 28. Thus the head room required for installing an overhead door construction of the type disclosed herein is reduced to a minimum because the moment that the door panels are initially shifted from their vertical door closing position, the uppermost panel suddenly swings rearwardly and moves along an arc corresponding substantially with the arc of the curved track section 28. Suitable counter-balancing mechanism such as a counterbalancing spring 62 is employed to facilitate movement of the door panels along the track structure. One extremity of the counter-balancing spring 62 may be secured to a depending frame member 64 and the other extremity of said spring connected with a sheave or pulley 66. A flexible lifting element or cable 68 is secured at one extremity to the door panels and passes from the panels around a pulley or sheave 70 and then around the sheave 66. From this point the cable extends to a suitable bolt 72 secured to the frame structure. Inasmuch as the invention is not directed to the specific form of counter-balancing mechanism, no further detailed description thereof is essential to a clear understanding of the present invention.

It will also be understood that the adjustability of the abutment member 36 upon its complementary track section coupled with the adjustability of the pin or sleeve 44 in the bracket 46 renders the mechanism just described adjustable to take care of variations in spacing and positioning of the associated parts with respect to the door jamb against which the panels are to be sealed. It will also be apparent that by having a portion of the bracket 46 extending normal to the plane of the uppermost panel, no portion of the mechanism for controlling the sealing of the uppermost door panel extends beyond the upper or free margin or edge of the panel 16. Thus when the panels have been shifted to their open or overhead position, no element projects rearwardly (to the right) of the door panels as viewed in Figs. 1 and 2. This enables the installation of the hardware necessary to bring about the automatic sealing of the uppermost door panels without requiring any extension or elongation of the horizontal track section 26. This is to be distinguished from other conventional mechanisms for controlling the uppermost panel wherein it is necessary to provide a track having a horizontal section which is longer than the conventional track in order to accommodate the panel operating mechanism. While certain structural features and details have been disclosed herein, it will be apparent that the invention is capable of other modifications and changes without departing from the spirit and scope of the appended claims.

The invention is hereby claimed as follows:

1. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions, including a support carried by the uppermost door panel, an abutment member carried thereby and extending adjacent the inner surface of the track structure, said abutment member being adapted for cooperative engagement with said inner surface of the track structure to effect lateral swinging of the uppermost door panel as an incident to the shifting of said panel along said track structure, and means in the vicinity of said support and operable within said track structure for guiding the uppermost panel along the upper portion of said track structure.

2. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions, including a support carried by the uppermost door panel, an abutment member carried thereby and extending adjacent the inner surface of the track structure, said abutment member being adapted for cooperative engagement with said inner surface of the track structure to effect lateral swinging of the uppermost door panel as an incident to the shifting of said panel along said track structure, means in the vicinity of said support and operable within said track structure for guiding the uppermost panel along the upper portion of said track structure, and a second abutment member secured in a fixed position and adapted to be engaged by the first abutment member to effect lateral swinging of the uppermost door panel toward its vertical position as an incident to the downward shifting of said door panels.

3. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions, including a support carried by the uppermost door panel, an abutment member carried thereby and extending adjacent the inner surface of the track structure, said abutment member being adapted for cooperative engagement with said inner surface of the track structure to effect lateral swinging of the uppermost door panel as an incident to the shifting of said panel along said track structure, means in the vicinity of said support and operable within said track structure for guiding the uppermost panel along

the upper portion of said track structure, a second abutment member secured in a fixed position and adapted to be engaged by the first abutment member to effect lateral swinging of the uppermost door panel toward its vertical position as an incident to the downward shifting of said door panels, and means for adjusting the position at which said abutment members engage.

4. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions including a support extending laterally of the uppermost door panel adjacent the free margin thereof and positioned within the limits determined by the free margin of said uppermost panel, an abutment member rigidly secured to said panel by said support, a second fixed abutment member adapted to be engaged by the first abutment and thereby effect swinging of the uppermost panel toward its vertical position, and means on said upper panel located below said lateral support when the door panels occupy their normal vertical position and operable within said track structure for guiding the uppermost panel along the upper portion of said track structure.

5. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions including a support extending laterally of the uppermost door panel adjacent the free margin thereof and positioned within the limits determined by the free margin of said uppermost panel, an abutment member adjustably positioned on said support, a second fixed abutment member adapted to be engaged by the first abutment and thereby effect swinging of the uppermost panel toward its vertical position, and means on said upper panel located below said lateral support when the door panels occupy their normal vertical position and operable within said track structure for guiding the uppermost panel along the upper portion of said track structure.

6. In combination with a plurality of hingedly connected door panels and a track structure for guiding said panels between closed vertical position and open overhead position, means for controlling the swinging of the uppermost door panel as it shifts between vertical and horizontal positions including a support extending laterally of the uppermost door panel adjacent the free margin thereof and positioned within the limits determined by the free margin of said uppermost panel, an abutment member carried by said support, a second abutment member adapted to be engaged by the first abutment and thereby effect swinging of the uppermost panel toward its vertical position, means for securing said second abutment in adjusted positions, and means on said upper panel located below said lateral support when the door panels occupy their normal vertical position and operable within said track structure for guiding the uppermost panel along the upper portion of said track structure.

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