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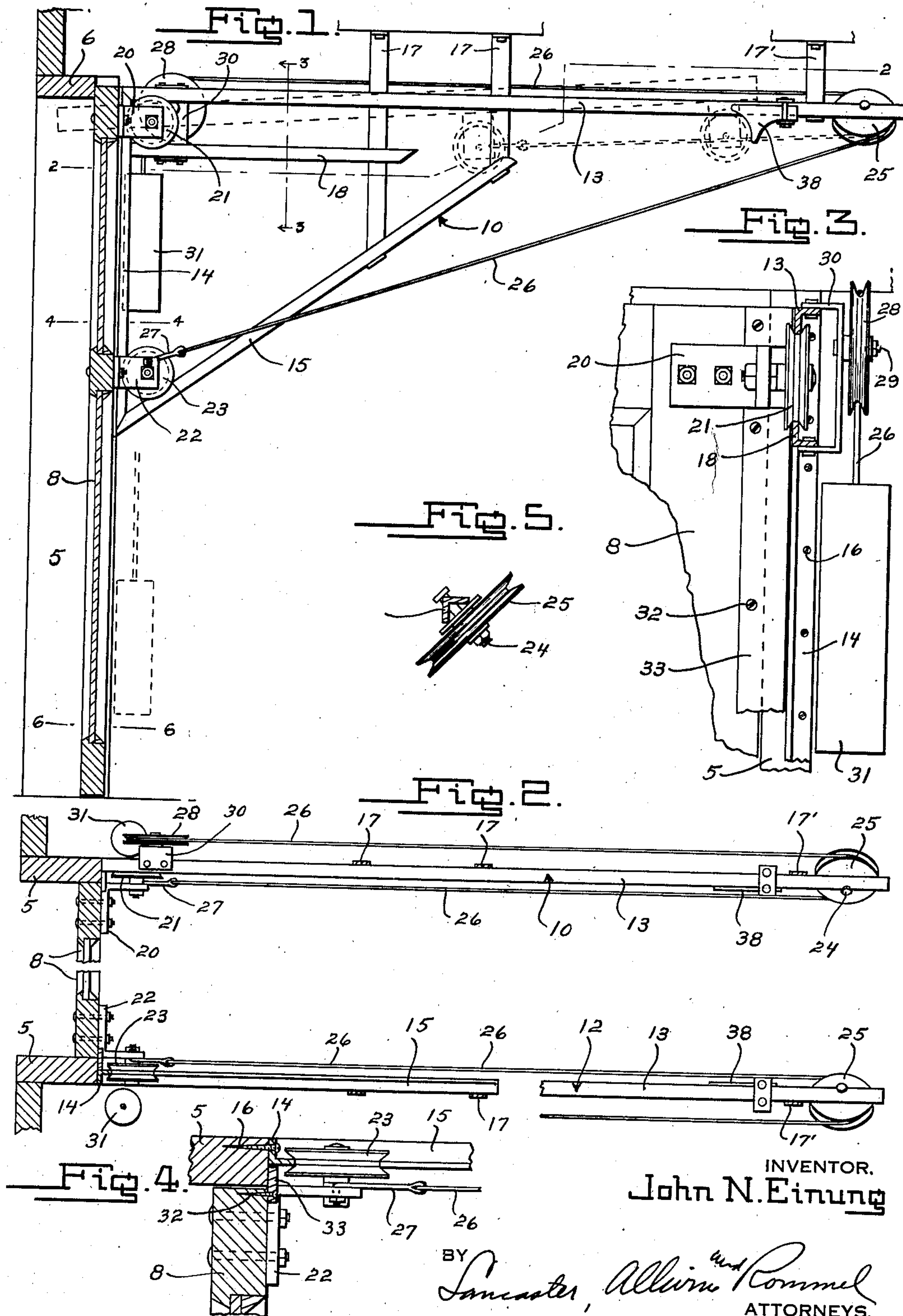
J. N. EINUNG

2,148,735

OVERHEAD DOOR TRACK CONSTRUCTION

Filed May 29, 1937

3 Sheets-Sheet 1



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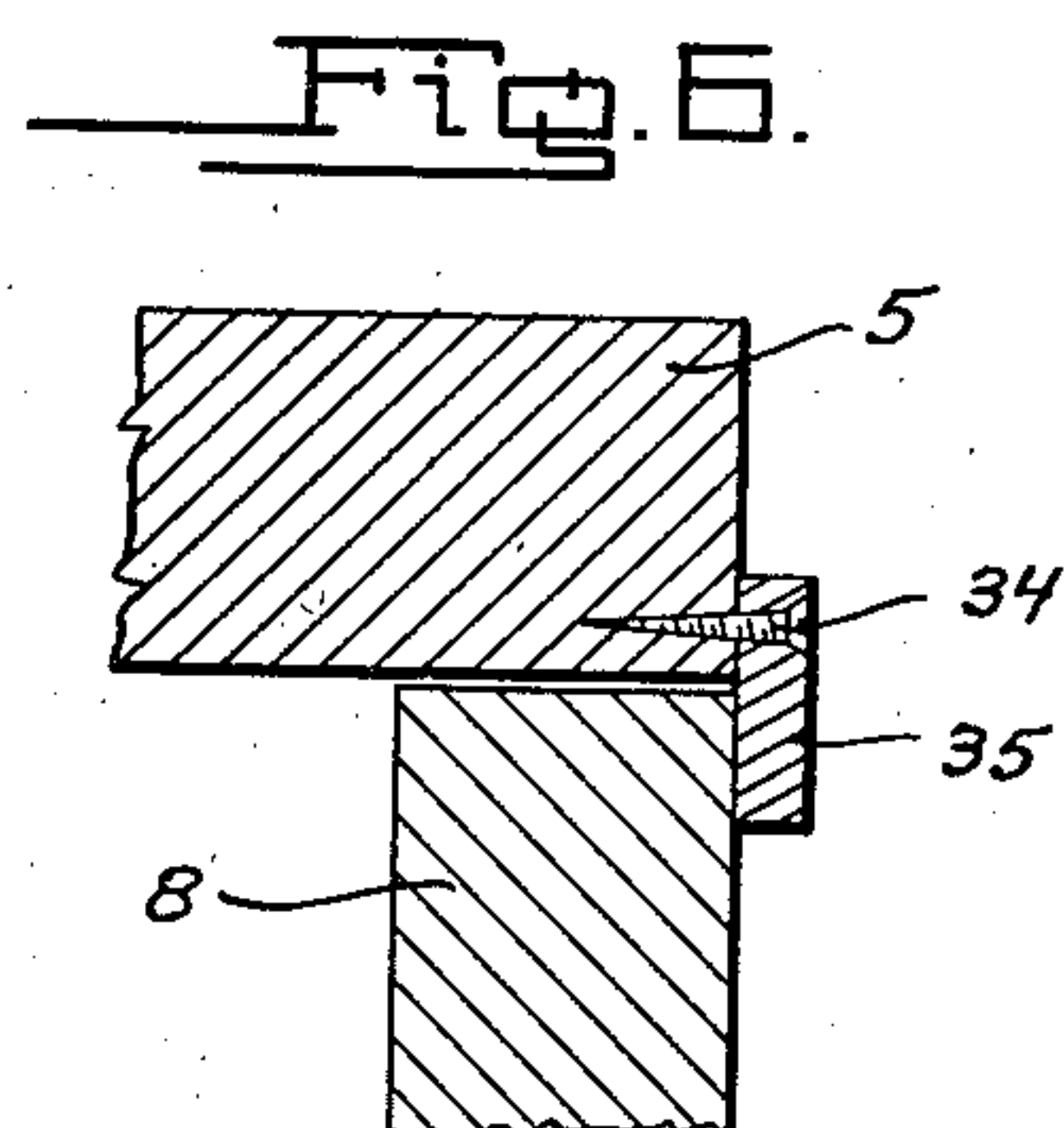
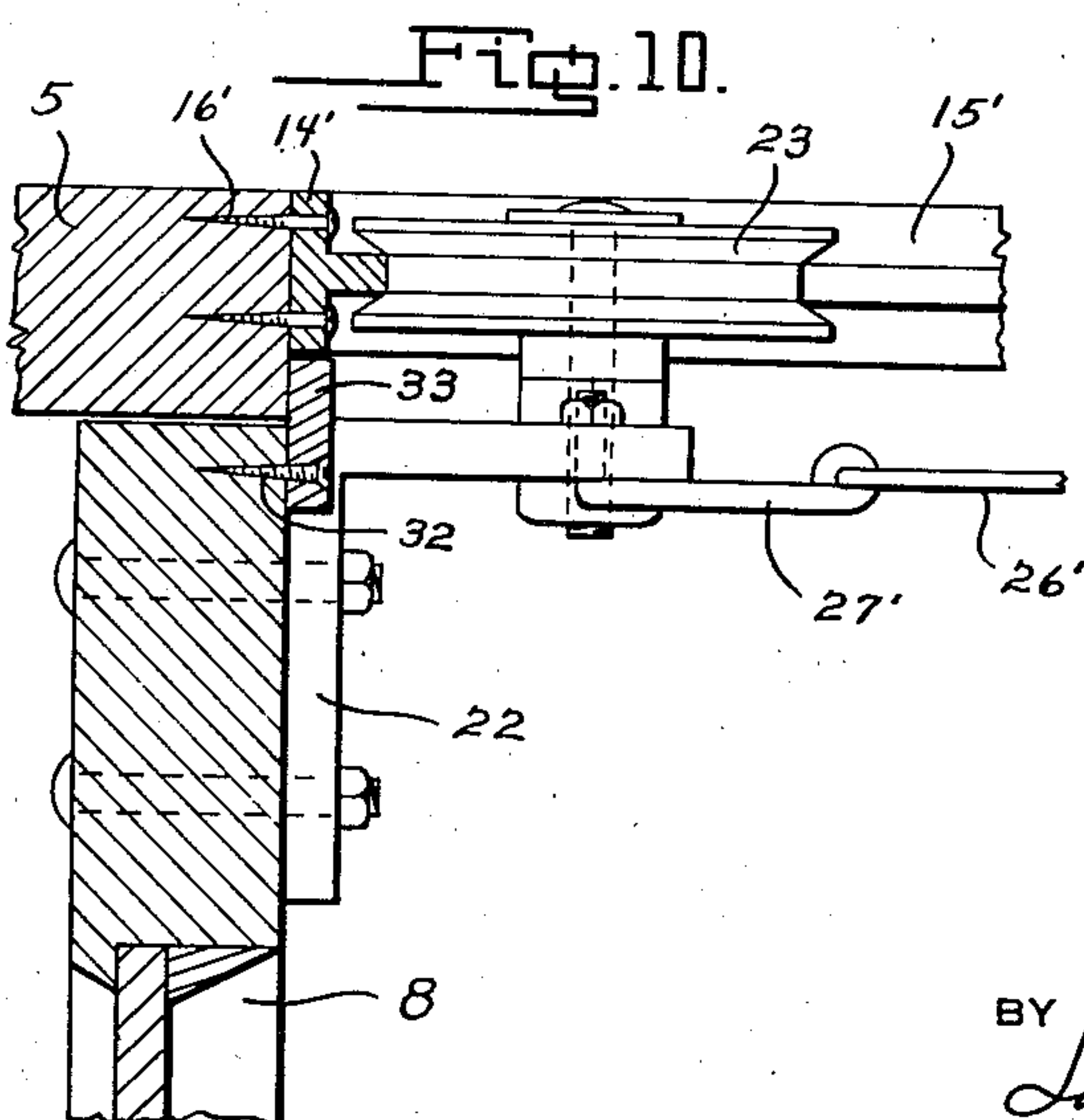
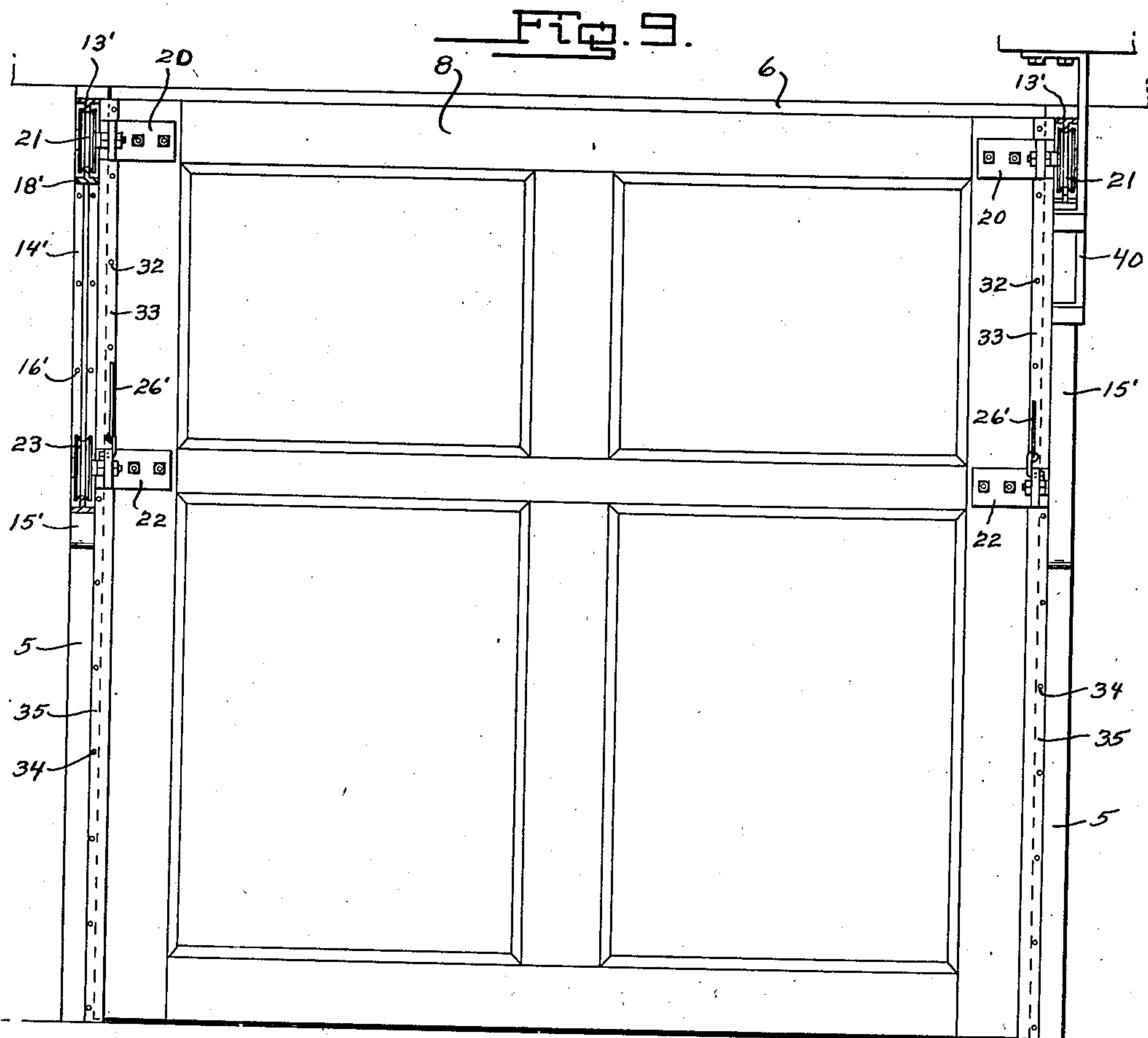
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3 Sheets-Sheet 2



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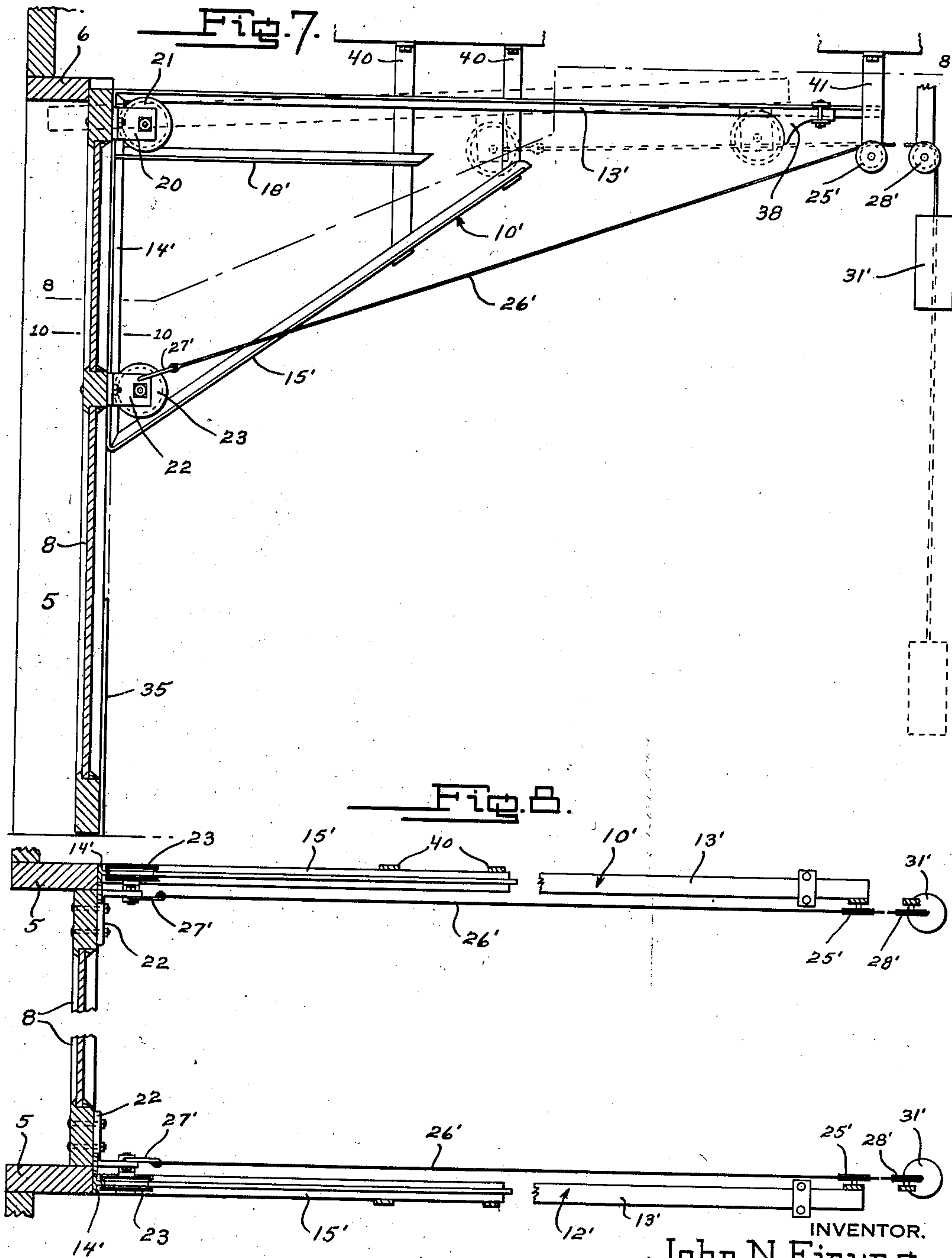
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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OVERHEAD DOOR TRACK CONSTRUCTION

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Application May 29, 1937, Serial No. 145,619

9 Claims. (Cl. 20—19)

The present invention relates to door constructions and more particularly to an improved overhead door for garages and the like wherein the door when opened is disposed in an elevated substantially horizontal position adjacent the ceiling of the garage.

The primary object of the invention is to provide an improved and simplified overhead garage door track construction which is capable of ready and easy mounting and upon which the door is easily guided from a vertical closed position to a substantially horizontal open position, counterbalancing means also being provided for permitting easy opening and closing movement of the door.

A further object of the invention is to provide an overhead garage door wherein the weight of the door when in a closed position is so hung at its intermediate portion as to cause the door to be normally urged to a fully closed position.

A further object is to provide a door of this type which may be easily and effectively weather stripped.

A still further object of the invention is to provide a track construction for overhead garage doors which is of extremely simple construction, one which may be very easily hung for use, and which may be very economically constructed from lengths of stock material.

Other objects and advantages of the invention will be apparent from the following detailed description, taken in connection with the accompanying drawings forming a part of this specification and in which drawings:

Figure 1 is a vertical section thru a garage or similar door provided with the improved track construction of this invention, the door being shown in full lines in its closed position and in dotted lines in its elevated open position.

Figure 2 is a view part in top plan and part in section on the line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary section substantially on the line 3—3 of Figure 1.

Figure 4 is an enlarged fragmentary section on line 4—4 of Figure 1.

Figure 5 is an enlarged vertical section thru one of the horizontal track portions of Figure 1 showing the manner of mounting the counterweight cable sheave at the inner end of the track.

Figure 6 is an enlarged detail section on line 6—6 of Figure 1.

Figure 7 is a vertical section similar to Figure 1 but showing a slightly modified form of track and counter-balancing means.

Figure 8 is a horizontal section on the line 8—8 of Figure 7.

Figure 9 is a view in elevation looking at the inner side of the door shown in Figure 7 and showing the track at one side of the door in vertical section.

Figure 10 is an enlarged horizontal section on line 10—10 of Figure 7.

Referring to the drawings in detail and wherein like reference characters designate corresponding parts thruout the several views, in the form of the invention as disclosed in Figures 1 to 6 inclusive, the building such as a garage or the like is provided with a door frame embodying the corner posts or jambs 5 and a header 6 providing a doorway or opening which is adapted to be closed by a solid or one piece door 8. The door 8 is of even width thruout its height and fits between the confronting faces of the jambs 5 as shown in Figure 2 whereby the lower portion of the door may swing outwardly thru the door opening during opening and closing of the door. When the door is closed, with its lower edge spaced slightly above the floor surface, the upper edge portion of the door abuts the inner edge of the header 6 as shown in Figure 1.

Disposed adjacent the vertical margins of the doorway are track members or units 10 and 12 forming a pair of right and left track members for mounting at corresponding sides of the doorway. These track members 10 and 12 are formed of angle iron and in their major construction are preferably of one piece formation providing a horizontal track portion 13, a vertical track portion 14 and an inclined track portion 15. These track portions 13, 14 and 15 may be formed from a single length of angle iron by cutting one flange and bending and welding at the juncture of the portion 14 with the other portions. The vertical track portion 14 is secured by suitable fastening elements 16 to the inner edge of the jamb 5 with its track flange extending inwardly, and extends from the top of the jamb downward to a point substantially midway of the height of the doorway. The horizontal track portion 13 extends inwardly from the upper end of the track portion with its track flange turned downwardly, and is suitably supported from the ceiling of the building by hangers 17 and 17'. The inclined track portion 15 extends inwardly and upwardly at an angle from the lower end of the track portion 14 with its track flange turned upwardly in vertical alignment beneath the track flange of the track portion 13, and with the inner end of the inclined track portion terminating in spaced

relation below the central portion of the horizontal track portion.

Extending inwardly from the vertical track portion 14 in parallel vertically spaced relation 5 below the track portion 13 is a short horizontal lift track portion 18, the inner end of which terminates in spaced relation to the upper end of the inclined track portion 15 as clearly shown in Figure 1. The inner ends of the track portions 15 and 18 are supported by the hangers 10 17. As shown in Figure 2, the confronting faces of the track members 10 and 12 are spaced apart a distance greater than the distance between the confronting faces of the jambs 5 so as to allow 15 free movement of the door between the track members and also permit ready weather stripping as will be later described.

The track members 10 and 12 provide track means for guiding the door 8 from its closed 20 vertical position to its open substantially horizontal position and vice versa. Secured upon the upper end portion and at the inner side of the door, at each vertical side edge thereof, are upper angle brackets 20 upon each of which is journaled a flanged track wheel 21. These upper 25 track wheels 21 co-act with the track portions 13 and 18 in guiding the upper portion of the door in a manner to be later described. Mounted upon the inner side of the door at each vertical side edge thereof, and at an elevation slightly above the mid-height of the door, are lower angle brackets 22 upon each of which is 30 journaled a flanged track wheel 23. These lower track wheels 23 are adapted for travel on the inclined track portions 15 during opening and closing of the door, and when the door is in a closed position co-act with the track portions 14 and 15 to support the weight of the door. As 35 will be observed in Figure 1, the track rollers 21 and 23 are offset inwardly from the door by their respective brackets 20 and 22.

A counter-balancing means is provided to make for easy opening and closing of the door and is such as to be supported directly from the 45 track members 10 and 12. This counterbalancing means is duplicated at each side of the door and a description of but one is believed will suffice. Journaled at the inner end of the horizontal track portion 13 as upon a spindle 24, 50 is a sheave 25 over which is trained a cable 26. As will be noted particularly in Figure 5, the spindle 24 extends diagonally thru the angle track 13 at an angle of 45° to the flanges of the track whereby the sheave is disposed at a 45° angle 55 with respect to the track flanges. With this angular mounting of the sheave 25 it will be seen that the sheave serves to direct the cable 26 from a position inwardly of and below the track, to a position outwardly of and above the track. 60 That end of the cable 26 which runs from below the sheave 25 is attached by a suitable hook or link 27 to the lower angle bracket 22 at a point slightly above the axis of the lower track wheel 23. The run of the cable which extends from 65 above the sheave 25 extends forwardly in parallel relation to the horizontal track portion 13 at a location spaced slightly above and outwardly of the track portion, and is trained over a sheave 28 journaled upon a horizontal spindle 70 29. This spindle 29 is mounted in a U bracket 30 having its upper and lower arms respectively secured to the track portions 13 and 18 whereby the sheave 28 is spaced slightly from the track and at a location adjacent to the jamb 5. Secured to the end of this forwardly extending run 75

of the cable 26 is a counter-weight 31 which upon opening and closing movement of the door moves vertically adjacent to the door jamb. Thus it will be seen that the cables 26 extend from the door inwardly and upwardly to the inner end 5 of the track members 10 and 12 and then return to the forward end of the track members whereby the counter-weights 31 will be disposed in an out of the way position adjacent the door jambs 5 and beyond the side margins of the doorway. 10 The counter-weights 31 are such as to substantially counter-balance the weight of the door whereby little or no effort will be required in opening or closing the door.

Referring now to the manner of sealing the 15 door when closed, and yet permitting the lower portion of the door to swing outwardly thru the doorway, the upper portion of the door 8 for the distance above the lower angle brackets 22 has secured to its inner face along each side 20 edge as by fastening elements 32, weather strips 33 which as shown in Figures 3 and 4 project beyond the side edges and overlap the side joints between the upper portion of the door and jambs. Secured to the inner edge of each jamb 5 as 25 by fastening elements 34 and extending from the bottoms thereof up to a height even with the bottoms of the lower angle brackets 22 when the door is closed, is a weather strip 35 which as shown in Figure 6 overlaps and seals the side 30 joints between the lower portion of the door and jambs. By having the upper portions 33 of the weather strips secured to the door and the lower portions 35 of the weather strips secured to the jambs 5, the lower portion of the door is free to swing outwardly and upwardly 35 thru the doorway.

By observing Figure 1 it will be seen that the lower track wheels 23, when the door is closed, rest in the V crotch formed by the track portions 14 and 15. Since these track wheels 23 40 are inwardly offset from the door, and are intended to carry the weight of the door, these track wheels act as horizontal pivot points for the door whereby the lower portion of the door is normally swung inwardly against the lower weather strips 35 and the upper portion of the door outwardly bringing the upper weather strips 33 against the jambs 5. 45

When opening the door from a closed position 50 as in Figure 1, it is only necessary to exert a slight outward force to the lower portion of the door whereby the door will swing up and out at the bottom and travel inwardly at the top. Upon this initial opening movement, the counter-weights 31 55 will pull the door up and back to its open position. As the door begins to open, it first pivots on the lower track wheels 23 and then causes the upper track wheels 21 to bear upon and move inwardly on the lift track portion 18 thus causing the 60 lower wheels 23 to start upward travel on track portions 15. As the door continues to open; thru the pull of the cables 26 and the overbalanced lower portion of the door in its movement toward a horizontal position, the upper track wheels 21 65 are urged upward against the horizontal track portion 13 before moving to the inner end of the lift track 18. When the door moves to its full open position the lower track wheels 23 come to rest adjacent the upper ends of the inclined track 70 portions 15 and opening movement is limited thru engagement of the upper track wheels 21 with suitable stops 38 adjustably secured to the inner end portions of the tracks 13.

Referring now to the form of the invention as 75

disclosed in Figures 7 to 10 inclusive, like reference characters have been applied to parts so far as possible which conform to similar parts in Figures 1 to 6.

5 In Figures 7 to 10, the door 8 is similar to that shown in Figure 1 and is provided at each side edge with upper angle brackets 20 on which are journaled upper track wheels 21, and lower angle brackets 22 on which are journaled lower track wheels 23.

10 The track members 10' and 12' are of like formation as that of the track members 10 and 12, and these track members 10' and 12' are formed of T iron and are interchangeable one for the other. The track members 10' and 12' are provided with a horizontal track portion 13', a vertical track portion 14', an inclined track portion 15' and a short horizontal lift track portion 16'. The vertical track portion 14' is secured by its base to the inner edge of the jambs 5 by fastening elements 16', and suitable hangers 40 and 41 serve to support the track portions 13', 15' and 18'. As will be observed, the track wheels 21 and 23 in the form of invention of Figures 7 to 10 are adapted for travel on the flange of the T-shaped tracks.

The counter-balancing means shown in Figure 7 is duplicated at each side of the door as in Figure 8 and each embodies a cable 26' secured at one end by a link 27' to the lower roller bracket 22. Each cable 26' is trained over a sheave 25' at the inner end of the horizontal track portion 13' and then over a sheave 28' located at some suitable position so as to dispose the counter-weight 31' in an out of the way location.

30 The weather stripping for the door 8 as shown in Figures 7 to 10 is similar to that as described in connection with Figures 1 to 6 and the same reference characters have been used to designate like parts. It may be well to state that in Figure 7, the upper section of weather strip 33 has been purposely omitted from this view to prevent possible confusion in the showing of the track portion 14'.

45 The operation of the door as shown in Figures 7 to 10 is similar to that as described in connection with Figures 1 to 6.

In each form of the invention it will be seen that the hangers for the track members are disposed at the outside of the members and the cables extend from the door along the inner or confronting sides of the track members. In both forms of the invention, the counter-balancing means is such as to have the counter-weights disposed at desirable locations so as not to cause objectionable interference. The track members may be very economically constructed from stock material and easily hung for use.

60 Changes in detail may be made to the forms of the invention herein shown and described, without departing from the spirit of the invention or the scope of the following claims.

I claim:

65 1. In an overhead door construction for doorways, a door for closing said doorway, track units mounted at opposite sides of the doorway each embodying a horizontal track portion extending inwardly from the upper end of the doorway, an inclined, straight track portion extending inwardly and upwardly from the doorway from a point slightly above midway the height of the doorway, and a short, straight lift track portion extending inwardly from the doorway in spaced relation below the horizontal track portion, upper track wheels on the door for guided horizontal

travel on the horizontal and lift track portions, and lower track wheels on the door for guided travel on said inclined track portions.

2. In an overhead door construction, a door frame embodying jambs, a door, a track member 5 mounted upon each jamb including a horizontal track portion extending inwardly from the upper end of the jamb, a horizontal lift track portion extending inwardly from the jamb in parallel relation below said horizontal track portion with its inner end terminating substantially midway of the latter, and an inclined straight track portion extending inwardly and upwardly from substantially midway the height of the jamb with its inner end terminating in spaced relation inwardly of the inner end of the lift track portion, upper track wheels inwardly offset on the upper end of the door and co-acting with the horizontal and lift track portions when the door is closed, and lower track wheels inwardly offset on the intermediate portion of the door for travel on said inclined track portion.

3. In an overhead door construction for doorways, a door, a pair of track members mounted at each side of the doorway each embodying a horizontal track portion, a lift track portion spaced parallel below the outer end of the horizontal track portion, and an inclined, straight track portion extending inwardly and upwardly from the doorway, upper track wheels at the top of the door for guided travel on the horizontal and the lift track portions, lower track wheels on the door for guided travel on the inclined track portion, and counter-balancing means for the door embodying cables connected with the door at said lower track wheels and extending to the inner ends of said horizontal track portions.

4. In an overhead door construction, a frame providing a doorway, a door, a pair of track members mounted on the frame, one at each side of the doorway, a pair of flanged upper wheels and a pair of flanged lower wheels carried by the door for guided travel on the track members whereby the door moves to an overhead position, and counter-weight-balancing means for the door including separate cables connected at one end with the door at said lower wheels, a sheave mounted at an angle at the inner end of each track member and over which the respective cables return toward the doorway in a position above and outwardly of their respective track members from a position below and inwardly of the track members, a sheave for each cable mounted at the forward end of each track member, and a counter-weight connected to each cable for vertical travel at the sides of the doorway.

5. In an overhead door construction for doorways, a door having straight side edges movable into said doorway, track members at opposite sides of the doorway for supporting and guiding the door from a vertical closed position to an overhead substantially horizontal position, a weather strip secured along each side of the upper portion of the door at the inner side thereof, a weather strip secured along each side of the lower portion of the doorway at the inner sides thereof, and counter-balancing means for the door, said door when in closed position being supported so as to be normally urged outwardly at its upper portion and inwardly at its lower portion.

6. In an overhead door construction, a door frame having jambs, a door, a unit track member at each side of the frame each comprising a vertical track portion secured to the jamb, a horizontal

- zontal track portion extending inwardly from the upper end of the vertical track portion, a lift track portion extending inwardly from the vertical track portion in parallel relation below the forward end of the horizontal track portion, and an inclined track portion extending inwardly and upwardly from the lower end of the vertical track portion, upper track wheels on the door co-acting with the horizontal and lift track portions, lower track wheels co-acting with the inclined track portion, the lower ends of the vertical and the inclined track portions forming a crotch limiting downward travel of the lower track wheels when the door is closed, and stops on the inner ends of the horizontal track portions engageable by the upper track wheels for limiting opening movement of the door.
7. An overhead garage door track comprising a one piece track body providing a straight horizontal track portion, a vertical track portion depending from the forward end of the horizontal track portion, and a straight angular track portion inclined from the lower end of the vertical track portion toward the central portion of the horizontal track portion, a lift track portion extending from the vertical track portion parallel

with and below the forward end portion of the horizontal track portion, and hangers for the track body and forming spacers for the inner ends of the angular and lift track portions.

8. In an overhead garage door track, a track member formed of angle iron providing a one piece vertical attaching portion having a horizontal track portion extending from its upper end and an inclined track portion extending from its lower end toward the horizontal track portion, and a lift track portion extending from the vertical portion parallel with the horizontal track portion for a portion of the length of the latter and terminating short of the inner end of the inclined track portion.

9. In an overhead garage door track, a track member formed of T-iron providing a one piece vertical attaching portion having a horizontal track portion extending from its upper end toward the horizontal track portion and a straight inclined track portion extending from its lower end toward the horizontal track portion, and a lift track portion extending from the vertical portion parallel with the horizontal track portion for a portion of the length of the latter.

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