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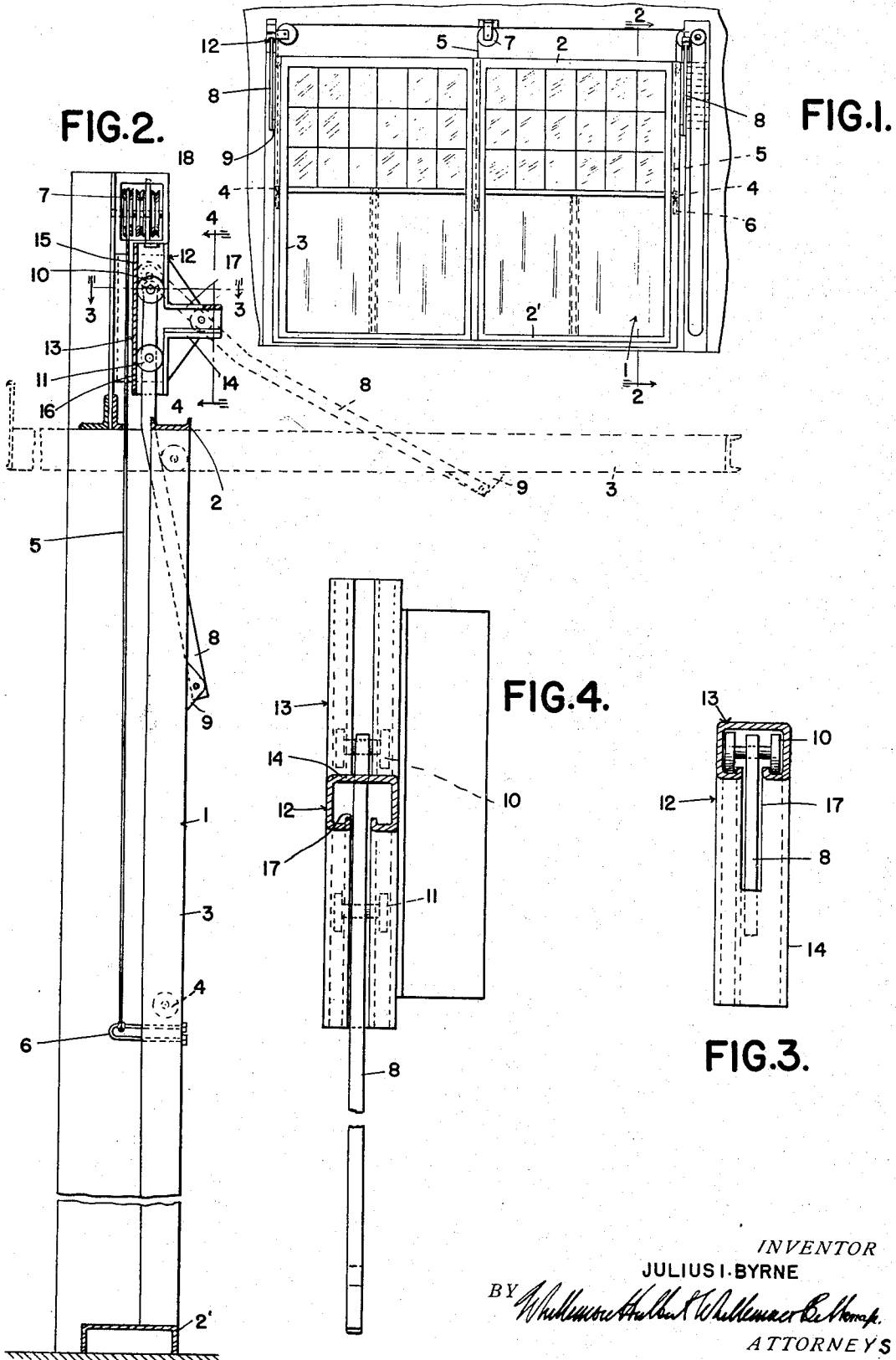
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2,080,693

DOOR CONSTRUCTION

Filed Nov. 11, 1935

2 Sheets-Sheet 1



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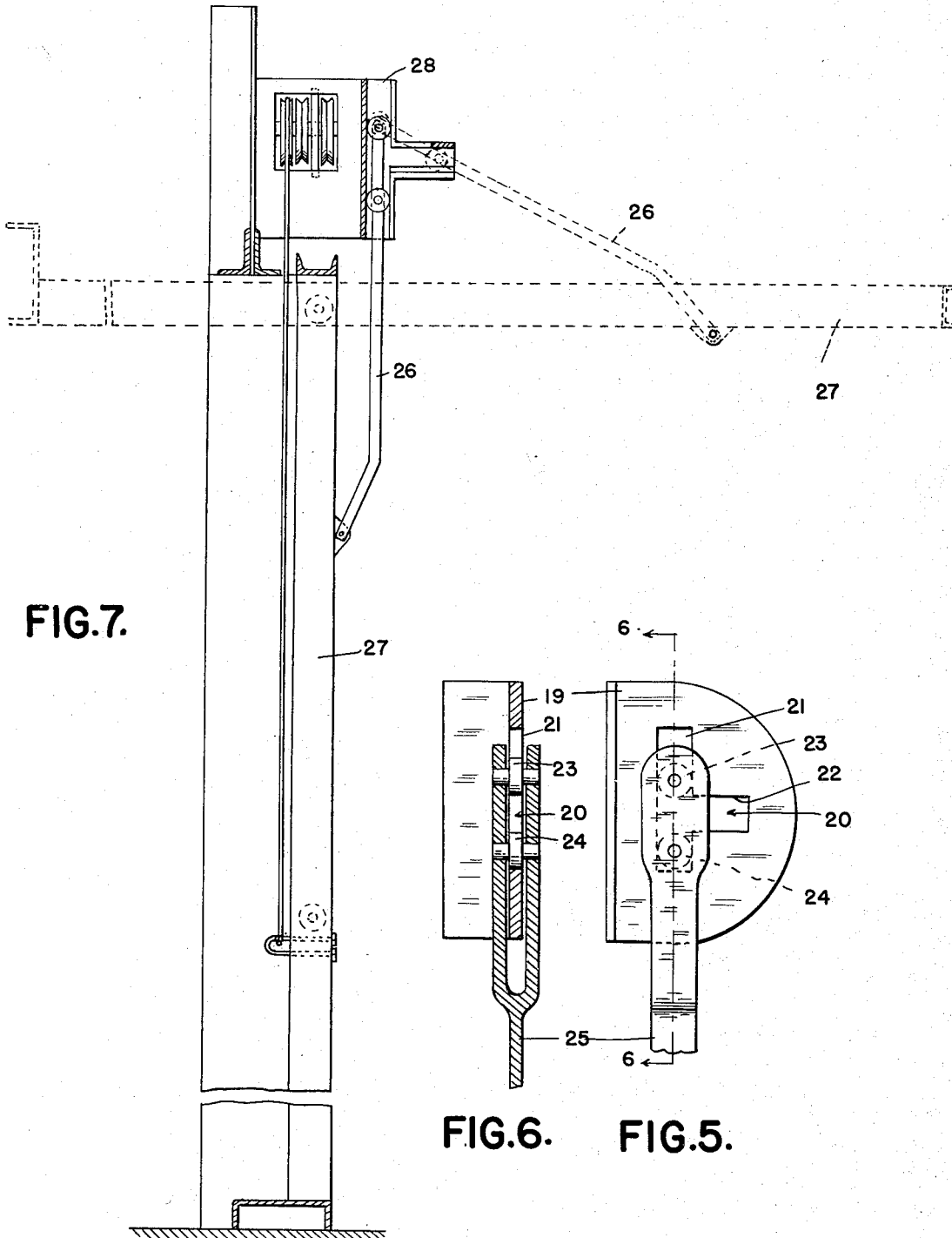


FIG. 7.

FIG. 6.

FIG. 5.

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DOOR CONSTRUCTION

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8 Claims. (Cl. 20—19)

The invention relates to door constructions and refers more particularly to door constructions for use in warehouses, airplane hangars and the like.

One of the objects of the invention is to provide an improved door construction which is opened by raising the same and in which the door moves bodily vertically during the first portion of the raising movement and then swings toward horizontal position. Another object is to so construct the door construction that it has positive guiding means. A further object is to provide an improved means for guiding the door during its raising and lowering movements.

These and other objects of the invention will become apparent from the following description, taken in connection with the accompanying drawings, in which

Figure 1 is an inside elevation of a door construction showing an embodiment of my invention;

Figure 2 is a cross section on the line 2—2 of Figure 1;

Figures 3 and 4 are cross sections on the lines 3—3 and 4—4, respectively, of Figure 2;

Figure 5 is a view similar to a portion of Figure 2, showing another embodiment of my invention;

Figure 6 is a cross section on the line 6—6 of Figure 5;

Figure 7 is a view similar to Figure 2 showing another embodiment of my invention.

As illustrated in the present instance, the door construction is for use in warehouses. The door 1 of the embodiment shown in Figures 1, 2, 3 and 4, has a metal frame with the top and bottom rails 2 and 2' respectively and the upright rails 3. The door is movable bodily or as a unit and is adapted to be opened by being raised. The door is so mounted that it moves vertically upwardly during the first portion of its opening movement and then swings or tilts about a horizontal axis with its upper edge movable rearwardly during the remaining portion of its opening movement. The door has secured to its end upright rails the rollers 4 which are located intermediate the upper and lower edges of the door and which engage suitable upright guide channels secured to the jambs at the sides of the door opening.

To open the door, I have provided the flexible linear members 5, such as steel cables, there being three in the present instance. These linear members extend in front of the door when closed and have their lower ends secured to the door by suitable means, such as the clevises 6, which are located preferably near the vertical center of the

door. In this connection, the rollers 4 are located with respect to these clevises to secure practical operating clearance for the clevises. The linear members extend over the sheaves 7 which are mounted upon the framework of the building and are located above the door. Suitable counterweights for the door are secured to the linear members and the linear members may be actuated either manually or by power to effect opening and closing of the door. With this arrangement, the linear members in opening the door tend to tilt the door in a direction such that its upper edge will move rearwardly.

The head guide or track construction for the door 1 comprises the arms or links 8 which have their lower ends pivotally connected to one of the faces of the upper portion of the door. In the present instance, there are two arms or links, one being at each end of the door. Each of these arms or links is pivotally connected to the bracket 9 extending rearwardly from the door frame. The upper end of each link is provided with the upper and lower pairs of rollers 10 and 11 respectively, which are spaced longitudinally or vertically of the link. For cooperating with each arm or link, there is the head track 12 which is T-shaped in elevation and which is located above the door in all positions. Each head track has the vertically extending track portion 13 and the horizontally extending track portion 14 which extends rearwardly from the vertically extending track portion and connects therewith intermediate its ends. The horizontally extending track portion is parallel to the path of movement of the door. The vertically extending track portion forms in effect the upper and lower track parts 15 and 16 respectively and the horizontally extending track portion in effect connects into the upper end of the lower track part. Both the vertically and horizontally extending track portions have the same cross section, as illustrated in Figures 3 and 4. The vertically extending track portion opens rearwardly and the horizontally extending track portion opens downwardly. The upper part or web of the horizontally extending track portion is also cut away at 17 to receive the portion of the arm or link above the lower rollers 11 when the arm or link is in angular position, such as illustrated by the dotted lines of Figure 2.

In operation and with the door closed, upon upward pulling of the linear members the arms or links will first be moved vertically by reason of their upper and lower rollers being positively guided by the vertically extending track portions

of each head guide or track. As a result, the first portion of the opening movement of the door is in a vertical direction. However, when each link is moved upwardly so that its lower rollers register with the transversely extending track portion of the head guide or track and its upper rollers engage the stop 18 at the upper end of each vertically extending track portion, these lower rollers will automatically enter the horizontally extending track portion by reason of the tilting effort produced upon the door by the linear members, so that the door will be moved angularly or tilted to horizontal position, as indicated by the dotted lines in Figure 2.

In the modification shown in Figures 5 and 6, the parts are so constructed that the same operation is secured. However, in this modification there are supporting or guiding plates 19 located above the door and extending transversely thereof and parallel to the path of movement of the door. Each plate is provided with the T-shaped slot 20 having the vertically extending portion 21 and the horizontally extending portion 22 which connects into the vertically extending portion intermediate its ends and which extends rearwardly therefrom. The longitudinally or vertically spaced upper and lower rollers 23 and 24 respectively upon the arm or link 25 are engageable in these portions of the slot in the same manner as the corresponding rollers with their vertically and horizontally extending track portions, illustrated in Figures 1 to 4 inclusive.

The modification illustrated in Figure 7 has the same general arrangement of parts as that illustrated in Figures 1 to 4 inclusive. However, in this modification the arms or links 26 corresponding to the arms or links 8 are located inwardly beyond the door 27 when the latter is in closed position to thereby enable more effective sealing between the jambs of the door frame and the ends of the door. The head tracks 28 are located inwardly beyond the inner face of the door and at an elevation above the door to provide for positioning the arms or links in the desired relation to the door.

What I claim as my invention is:

1. In a door construction, the combination with a door and means for bodily raising said door and exerting a rearward pressure upon its upper portion, of hanger means pivotally connected to the upper portion of said door, track means for engaging said hanger means, said track means having a vertically extending portion and a rearwardly extending portion connecting into said vertically extending portion intermediate its upper and lower ends for respectively compelling said hanger means to move bodily vertically during the first portion of the raising movement and providing for subsequent swinging of said door.

2. In a door construction, the combination with a door and means for bodily raising said door, of hangers pivotally connected at their lower ends to the upper portion of said door, each of said hangers having a pair of rollers spaced longitudinally thereof and tracks for engaging the rollers of each hanger, each track having a vertically extending portion for engaging the rollers at the same time, and a horizontally extending portion intermediate its upper and lower ends for engaging the lower of the rollers upon predetermined vertical movement of the door to provide for swinging the associated hanger.

3. In a door construction, the combination with a door and means for bodily raising said door and exerting a rearward pressure upon its upper por-

tion, of supporting plates having T-shaped slots with vertically extending portions and transversely extending portions extending rearwardly from said vertically extending portions and hangers pivotally connected at their lower ends to said door and provided with upper and lower rollers spaced longitudinally thereof, both of said rollers of each hanger being adapted to engage the vertically extending portions of the associated plate and the lower roller of each hanger being adapted to engage the transversely extending portion of the associated plate.

4. In a door construction, the combination of a door mounted for bodily upward and rearward tilting movement to open position, of supporting plates having slots with vertically extending parts and rearwardly extending parts, and hangers pivotally connected at their lower ends to said door and provided with upper and lower rollers spaced longitudinally thereof, the upper of said rollers being engageable with said vertically extending parts and the lower of said rollers being engageable with said rearwardly extending parts during raising of said door.

5. In a door construction, the combination with a door and means for bodily raising said door, of hanger means pivotally connected to said door and track means for engaging and guiding said hanger means, said track means having vertically extending parts to compel said hanger means to move bodily vertically during a portion of the raising movement, said track means also having a part extending laterally from one of said first mentioned parts and parallel to the path of movement of said door to provide for swinging of said door during another portion of the raising movement.

6. In a door construction, the combination with a door and means for bodily raising said door, of hanger means pivotally connected to said door, said hanger means comprising an arm having a pair of projecting parts spaced longitudinally thereof, and track means for engaging and guiding said hanger means, said track means having a pair of vertically extending parts with each part engageable with one of said projecting parts to compel said hanger means to move bodily vertically during a portion of the raising movement, said track means also having a part extending laterally from one of said first mentioned parts and parallel to the path of movement of said door and engageable with one of said projecting parts to provide for swinging of said door during another portion of the raising movement.

7. In a door construction, the combination with a door and means for bodily raising said door, of hangers pivotally connected at their lower ends to said door, each of said hangers having a pair of projecting parts spaced longitudinally thereof and tracks for engaging the projecting parts of each hanger, each track having an upper vertically extending part for engaging one of said projecting parts at all times, a lower vertically extending part for engaging the other of said projecting parts during a portion of the raising movement of said door, and a laterally extending part connecting into the upper portion of said lower vertically extending part and engageable with the last mentioned projecting part during another portion of the raising movement of said door, whereby said door is compelled to move bodily vertically during a portion of the raising movement and al-

lowed to swing during another portion of the raising movement.

5 8. In a door construction, the combination with a door and means for bodily raising said door, of hangers pivotally connected at their lower ends to the door, each of the hangers having projecting parts spaced from each other longitudinally thereof, tracks for engaging the projecting parts of each hanger, each track

having an upper vertically extending part for engaging one of the projecting parts and having a lower vertically extending part for engaging the other of the projecting parts, and a laterally extending part connecting into the track between the two parts aforesaid thereof and engageable with the second mentioned projecting parts on said hangers. 5

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