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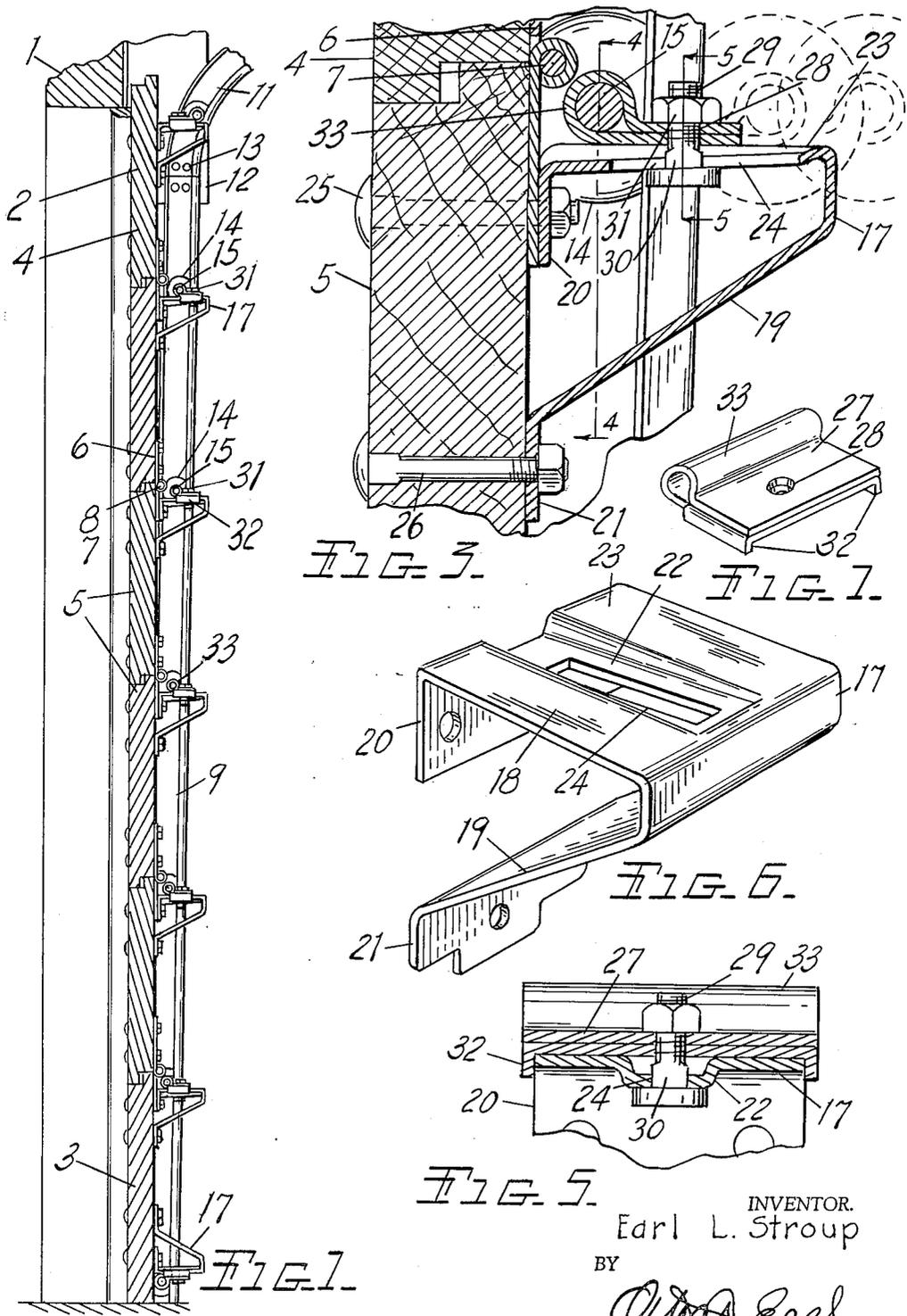
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UPWARDLY ACTING DOORS AND ROLLER SPINDLE SUPPORTS THEREFOR

Filed Sept. 26, 1957

2 Sheets-Sheet 1



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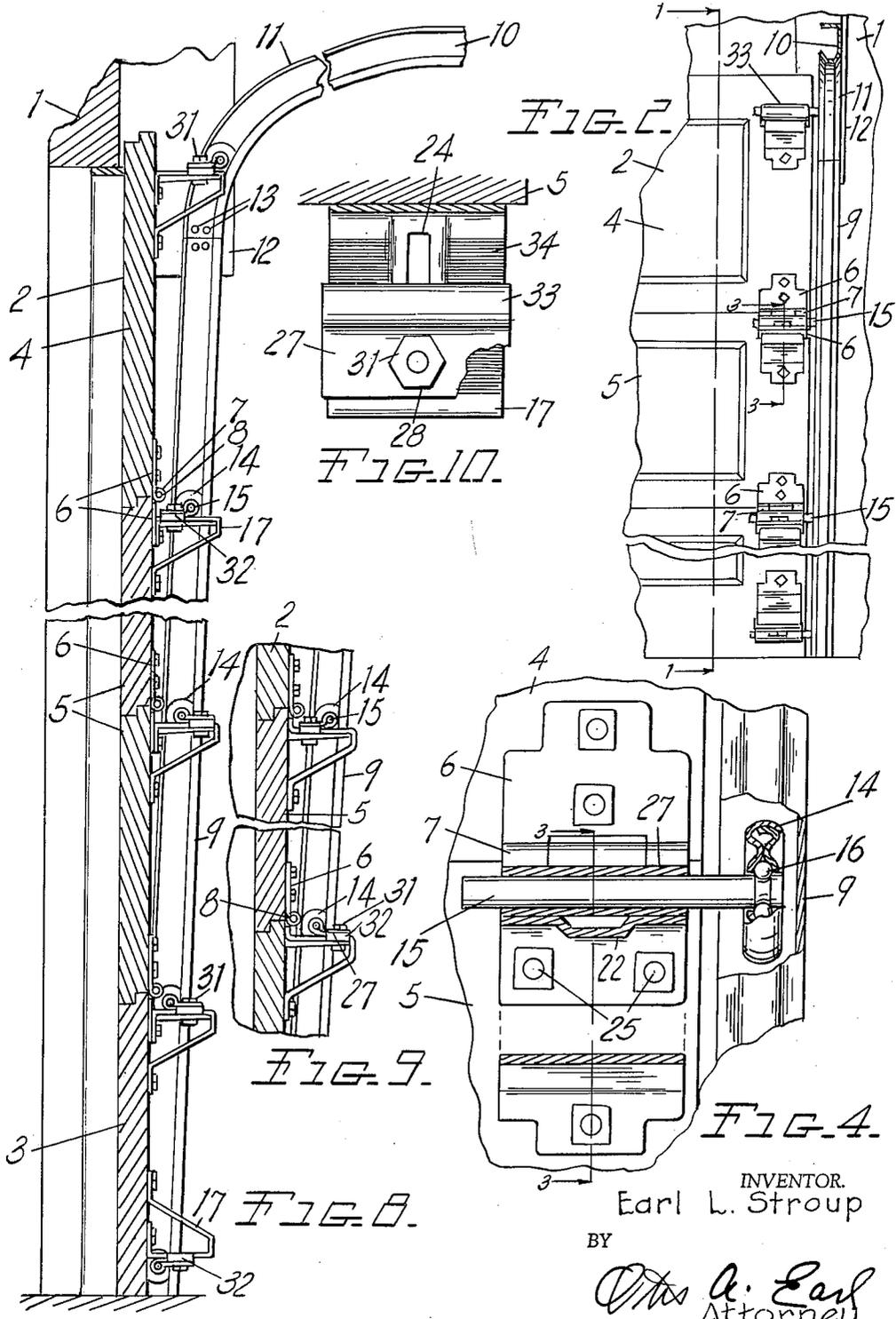
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## UPWARDLY ACTING DOORS AND ROLLER SPINDLE SUPPORTS THEREFOR

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6 Claims. (Cl. 160—201)

This invention relates to upwardly acting doors provided with adjustable track engaging rollers.

The main objects of this invention are:

First, to provide an upwardly acting door assembly comprising a plurality of articulated sections with adjustable means for supporting the sections to insure effective closing of the door against the jamb and freeing the door from the jamb on the initial opening movement of the door.

Second, to provide a structure having these advantages comprising tracks having rearwardly inclined upright sections with roller supporting means that are adaptable for use on all of the sections including rollers positioned adjacent the lower edge of the bottom section and adjacent the upper edge of the top section.

Third, to provide a roller supporting bracket for upwardly acting doors and the like which may be positioned in selected relation to the hinged connections of the sections either adjacent the upper edge of the lower section of a pair of articulated sections or adjacent the lower edge of the upper section of the pair.

Fourth, to provide a supporting bracket for spindles of track engaging rollers which have a wide range of adjustment and one in which the parts are very securely held in their adjusted positions and at the same time are simple and economical in structure.

Fifth, to provide a structure having these advantages which permits adjustment at the place of installation of the door and is thereby adapted to quite a wide range of structural conditions.

Further objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary vertical section of an upwardly acting door assembly embodying my invention on a line corresponding to line 1—1 of Fig. 2.

Fig. 2 is a fragmentary inside elevational view.

Fig. 3 is an enlarged fragmentary view on a line corresponding to line 3—3 of Figs. 2 and 4, the roller spindle socket member being shown in one position by full lines and in two positions by dotted lines.

Fig. 4 is a fragmentary view partially in section on a line corresponding to line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view mainly in section on a line 5—5 of Fig. 3.

Fig. 6 is a front perspective view of the roller supporting bracket.

Fig. 7 is a perspective view of the roller spindle socket member.

Fig. 8 is a fragmentary vertical section corresponding generally to that of Fig. 1 showing other adaptations of the roller supporting brackets to meet other conditions than are illustrated in Fig. 1.

Fig. 9 is a fragmentary view illustrating further adjustments or adaptations.

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Fig. 10 is a plan view illustrating a modification of the spindle supporting brackets.

In the embodiment illustrated 1 represents a door frame and 2 the door, the door comprising a bottom section 3, top section 4 and a plurality of articulated sections 5. The sections are hingedly connected desirably by leaf type hinges, that is, hinges having leaves 6 provided with knuckles 7 connected by the pivots or pintles 8. In the embodiment illustrated these are conventionally shown and the hinges arranged so that their pintles are in the plane of the joints between the sections to permit the inward swinging of the sections relative to each other.

The tracks comprise upright sections 9 which are inwardly inclined relative to the door jamb, upper or horizontal sections 10 and intermediate curved sections 11 which coact with the upright and horizontal sections to provide a continuous track. The upper ends of the upright sections 9 and the lower ends of the intermediate sections 11 are connected to the head plates 12 by means of rivets or bolts conventionally illustrated at 13. Track engaging rollers 14 are provided with spindles 15, the rollers having ball bearings 16.

It is important that the door when closed be firmly seated against the jamb. Resilient jamb seals may be used but they are not here illustrated. The roller spindles are supported so that their position relative to the plane of the door may be widely varied and the supports therefor of this invention permits such variation and the adaptation to position of the roller relative to the plane of the door.

In the accompanying drawings we have illustrated the hinges and roller supports for only one side or edge of the door but it will be understood that these parts are duplicated at the other side edge of the door.

The adjustable roller supports of this invention comprise bracket members 17 of inwardly facing U-shape, the arms 18 and 19 thereof being provided with laterally projecting flanges 20 and 21 respectively. The arm 18 is provided with an intermediate inwardly offset portion 22 disposed at an angle to the face 23 of the bracket and having a longitudinal slot 24 therein. The flange 20 of the arm 18 of the bracket is disposed at right angles thereto so that when it is bolted to a door section by means of the bolts 25 the arm 18 is substantially at right angles to the plane of the door section.

The arm 19 of the spindle supporting bracket is disposed at an angle to the arm 18 so that it serves as a brace or strut therefor. This arm is secured to the door section by means of the bolt 26.

In the embodiment illustrated the bolts 25 serve the double purpose of securing the spindle supporting bracket and also the leaf of the hinge on which the bracket is super-imposed. The spindle socket member 27 has a plate-like body portion provided with a central bolt opening 28 for the securing bolt 29 which is arranged through the slot 24 and has a rectangular shank portion 30 nonrotatably engaging the slot 24. The bolt may be adjusted lengthwise of the slot when the clamping nut is released to properly position the roller relative to the door section on which it is mounted. The socket body member is provided with flanges 32 on its side edges which embrace the edges of the bracket arm to prevent lateral twisting or swinging movement of the spindle socket member.

The spindle socket member is provided with an open ended tubular socket 33 for the roller spindle 15 which permits axial movement of the spindle in the socket with the rollers 14 engaged in the track and also permits the socket spindles being engaged with the sockets from either end thereof so that the fixtures are adapted for use at both edges of the door.

In the embodiment illustrated the spindle socket member 27 is formed of sheet metal stock folded to form the spindle socket 33 with portions of the stock extending from the socket disposed in overlapping relation, as is illustrated in Fig. 7. These overlapping end portions of the socket member 27 are clamped by the bolt 29 upon the face of the bracket member so that the socket cannot open under shocks and use stresses. The head of the bolt 29 being engaged with the inwardly offset inclined portion 22 of the arm 18 of the bracket 17 prevents any inward movement of the socket member on the bracket as a wedging action results when the thrust on the spindle socket member is inwardly, that is inwardly relative to the supporting bracket, see Fig. 3.

This functioning relation of the parts is highly desirable as the greatest stress and shock in an installation, such as illustrated in an upwardly acting door, results when the door is forced against the jamb in closing or when the door is moved to jamb engaging position. In Fig. 10 I have illustrated the bracket as having a ribbed or knurled face 34 which further aids in holding the spindle socket member in its adjusted position.

The embodiment illustrated provides a wide range of adjustment, that is, the positioning of the roller relative to the plane of the door. This is illustrated in both Figs. 1 and 8, however, more adaptations being illustrated in Fig. 8 than in Fig. 1. A roller supporting means is provided which may be used not only with the hinge connections for the door but on either side of the hinge and also at the lower edge of the bottom section and at the upper edge of the top section. The arrangement of the supporting brackets on the lower edge of the upper section of a pair of articulated sections results in less throw of the hinge connections for the sections so as to pass around the intermediate section of the curve of the track which adds substantially to the smoothness of operation.

In practice very considerable variations in installing conditions exist and with a structure such as illustrated the single roller support is adapted for a very wide range of adjustment and can be easily adjusted to meet the varying installing conditions and the parts are securely retained in adjusted position.

I have not attempted to illustrate or describe other embodiments or adaptations of my invention as it is believed this disclosure will enable those skilled in the art to embody or adapt the invention as may be desired.

Having thus described the invention what is claimed as new and desired to secure by Letters Patent is:

1. The combination of, a track engaging roller provided with a spindle, a U-shaped bracket member having laterally disposed attaching flanges at the inner ends of its arms, one arm of the bracket member being disposed at substantially right angles to its attaching flange and having a planar face portion and a longitudinally extending intermediate portion offset inwardly relative to its said face portion and disposed in an inwardly diverging relation thereto and having a longitudinally extending slot therein, a spindle socket member having a plate like body portion reversibly positionable on said arm having said offset portion and provided with a socket at one end thereof with which the said spindle is supportedly engaged and having laterally projecting flanges on its side edges supportedly and slidably embracing said edges of said bracket arm, a bolt disposed through said slot in said bracket arm in nonrotatable engagement with the edges thereof and extending through said socket member provided with a nut for clampingly securing said socket member in its adjusted position on said arm, the inclination of the inwardly offset portion of said arm relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

2. The combination of, a track engaging roller pro-

vided with a spindle, a U-shaped bracket member having laterally disposed attaching flanges at the inner ends of its arms, one arm of the bracket member being disposed at substantially right angles to its attaching flange and having a planar face portion and a longitudinally extending intermediate portion offset inwardly relative to its said face portion and disposed in an inwardly diverging relation relative thereto and having a longitudinally extending slot therein, a spindle socket member having a plate like body portion positionable on said arm having said offset portion and provided with a socket with which the said spindle is supportedly engaged, a bolt disposed through said slot in said bracket arm and extending through said socket member provided with a nut for clampingly securing said socket member in its adjusted position on said arm, the inclination of the inwardly offset portion of said arm relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

3. The combination of, a track engaging roller provided with a spindle, a bracket member including a face portion having a longitudinally extending portion offset inwardly relative to its face portion and disposed in an inwardly diverging relation relative thereto and having a longitudinally extending slot therein, a spindle socket member having a body portion reversibly positionable on said bracket member and provided with a socket at one end thereof with which the said spindle is supportedly engaged and having laterally projecting flanges on its side edges supportedly and slidably embracing said edges of said bracket member, and a clamping member disposed through said slot in said bracket member in nonrotatable engagement with the edges thereof and extending through said socket member to clampingly hold said socket member in its adjusted positions on said bracket member, the inclination of the inwardly offset portion of said bracket member relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

4. The combination of, a track engaging roller provided with a spindle, a bracket member including a face portion having a longitudinally extending portion offset inwardly relative to its face portion and disposed in an inwardly diverging relation relative thereto and having a longitudinally extending slot therein, a spindle socket member having a body portion positionable on said bracket member and provided with a socket with which the said spindle is supportedly engaged and having laterally projecting flanges on its side edges supportedly and slidably embracing said edges of said bracket member, and a clamping member disposed through said slot in said bracket member and extending through said socket member to clampingly hold said socket member in its adjusted positions on said bracket member, the inclination of the inwardly offset portion of said bracket member relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

5. An upwardly acting door assembly comprising a plurality of articulatedly connected door sections, a track comprising a rearwardly inclined upright section, means for supportedly and movably connecting each of the door sections to said track including a track engaging roller for each section provided with a spindle, means for adjustably supporting and connecting each of said spindles to a door section comprising a bracket member connected to each door section and including a face portion having a longitudinally extending portion thereof offset inwardly relative to its face portion and disposed in an inwardly diverging relation relative thereto and having a longitudinally extending slot therein, a spindle socket member having a plate like body portion reversi-

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bly positionable on said bracket member and provided with a socket at one end thereof with which the said spindle is supportedly engaged and having laterally projecting flanges on its side edges supportedly and slidably embracing said edges of said bracket member, and a clamping member disposed through said slot in said bracket member in nonrotatable engagement with the edges thereof and extending through said socket member to clampingly hold said socket member in its adjusted positions on said bracket member, the inclination of the inwardly offset portion of said bracket member relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

6. An upwardly acting door assembly comprising a plurality of articulatedly connected door sections, a track comprising a rearwardly inclined upright section, means for supportedly and movably connecting each of the door sections to said track including a track engaging roller for each section provided with a spindle, means for adjustably supporting and connecting each of said spindles to a door section comprising a bracket member connected to each door section and including

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a face portion having a longitudinally extending portion thereof offset inwardly relative to its face portion and disposed in an inwardly diverging relation relative thereto and having a longitudinally extending slot therein, a spindle socket member having a body portion positionable on said bracket member and provided with a socket with which the said spindle is supportedly engaged, and a clamping member disposed through said slot in said bracket member to clampingly hold said socket member in its adjusted positions on said bracket member, the inclination of the inwardly offset portion of said bracket member relative to the face thereof being of such degree that a wedging action results when said spindle socket member is subjected to inward thrust stress relative to the bracket.

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