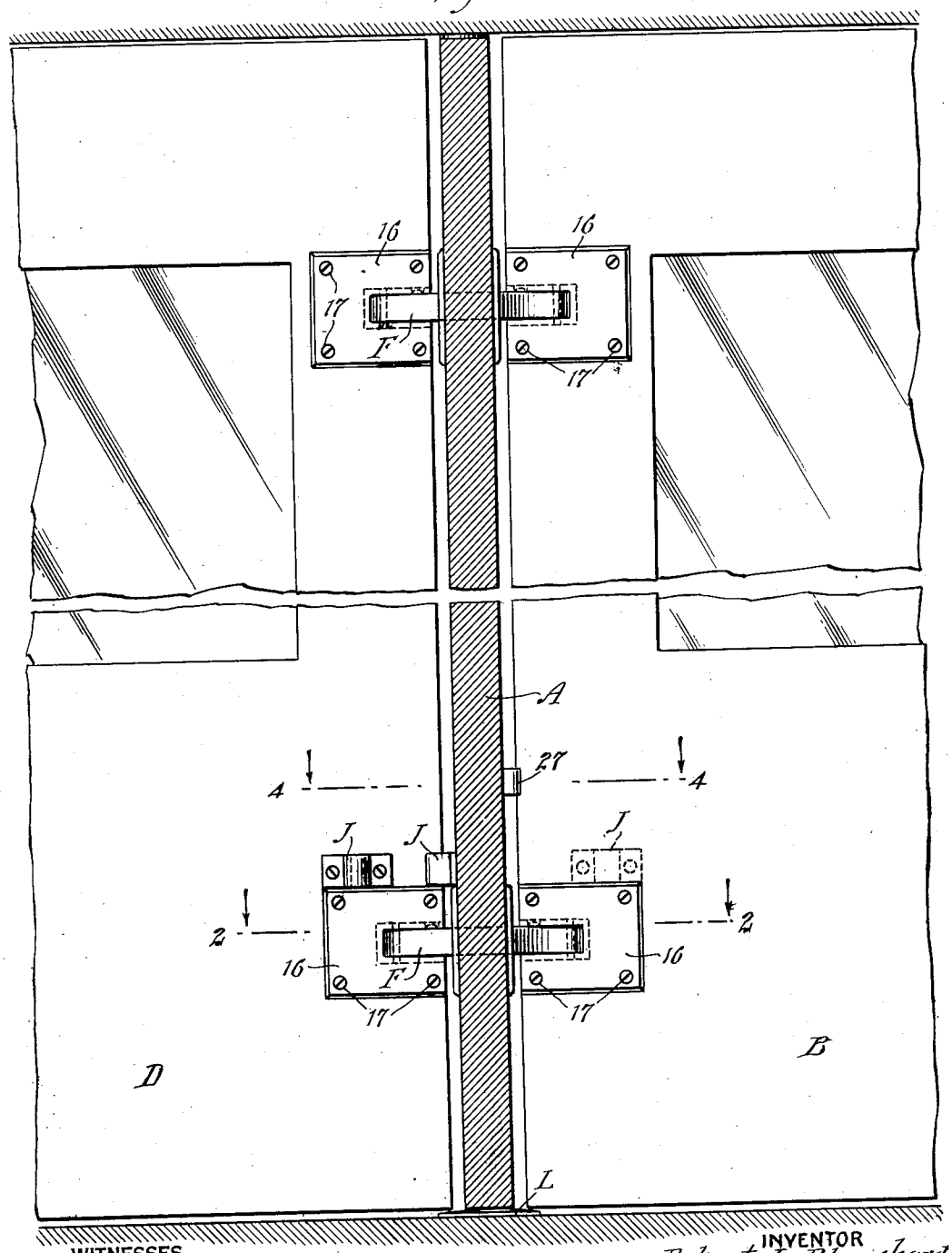
July 3, 1934. R. L. BLANCHARD 1,965,449

SEMICOLLAPSIBLE REVOLVING DOOR STRUCTURE

Filed March 3, 1931 3 Sheets-Sheet 1

Fig. 1.



WITNESSES

Edw. Thorpe

Hugh H. Ott

INVENTOR

Robert L. Blanchard

BY Munn & Co.

ATTORNEY

July 3, 1934. R. L. BLANCHARD 1,965,449

SEMICOLLAPSIBLE REVOLVING DOOR STRUCTURE

Filed March 3, 1931 3 Sheets-Sheet 2

Fig. 2.

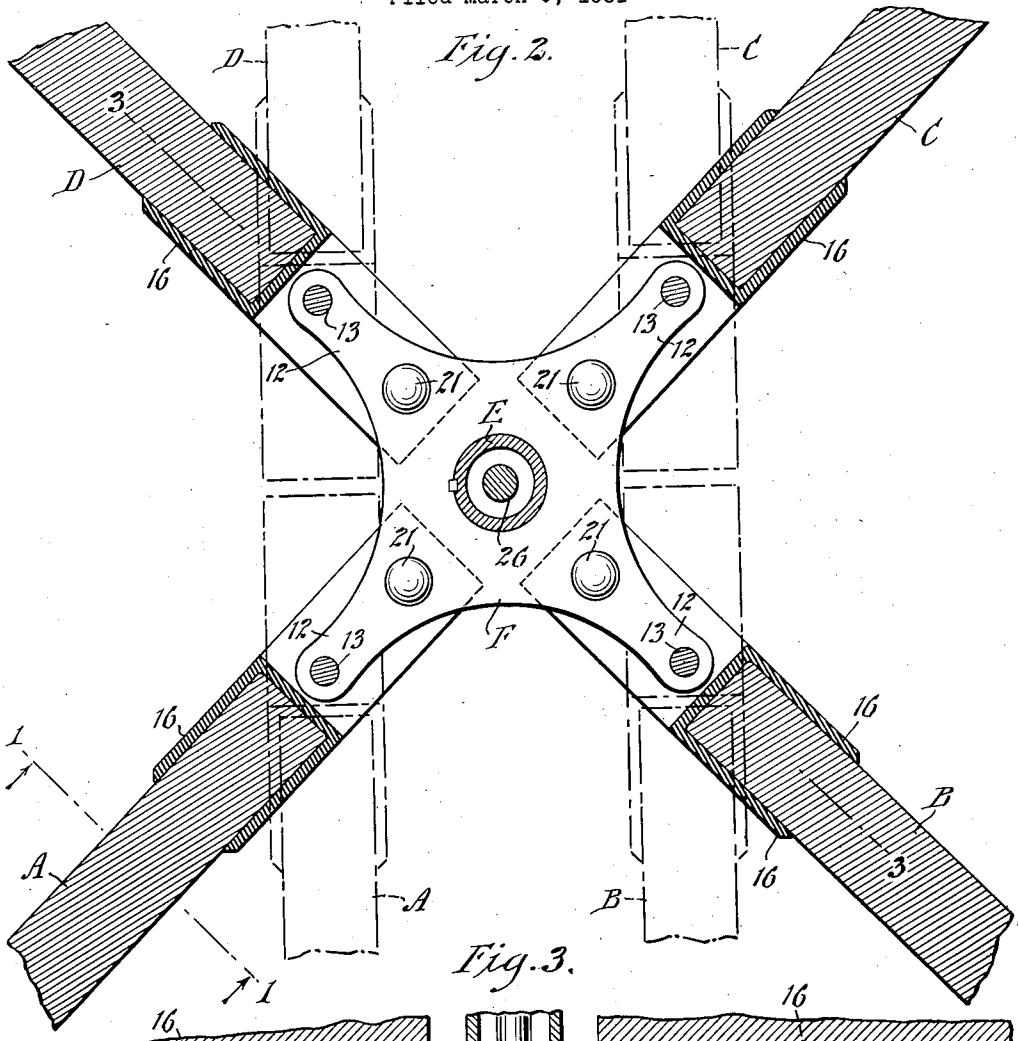
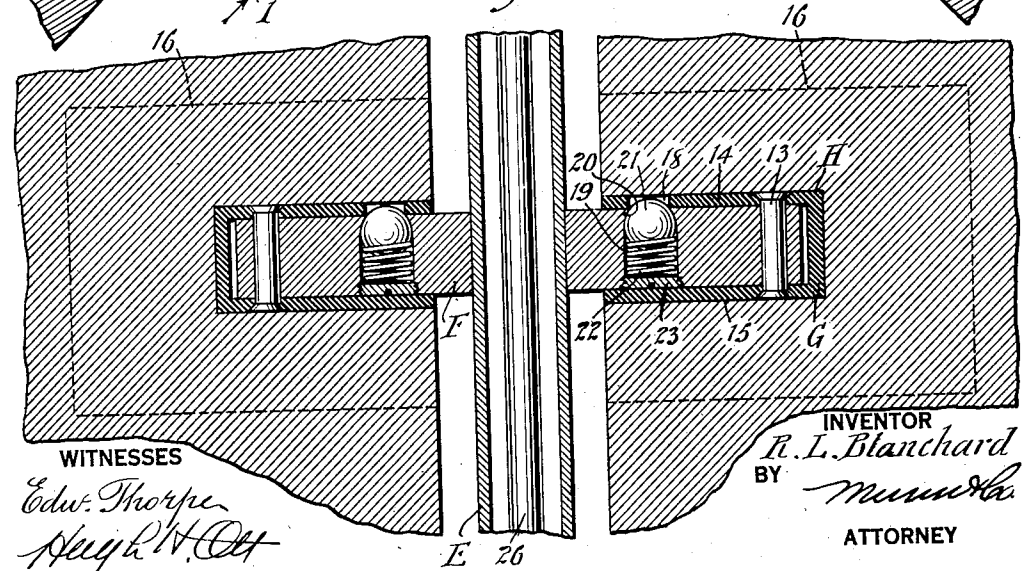


Fig. 3.



WITNESSES

Edw. Thorpe

INVENTOR

R. L. Blanchard

BY

ATTORNEY

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SEMICOLLAPSIBLE REVOLVING DOOR STRUCTURE

Filed March 3, 1931 3 Sheets-Sheet 3

Fig. 4.

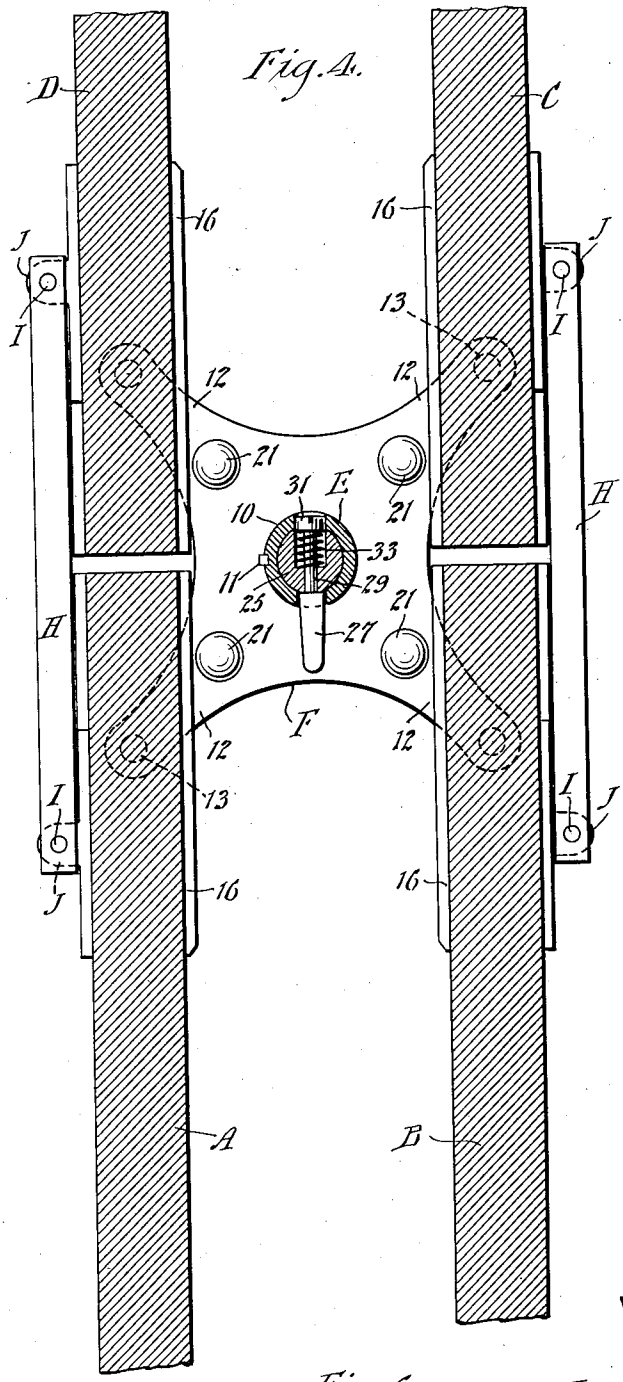


Fig. 5.

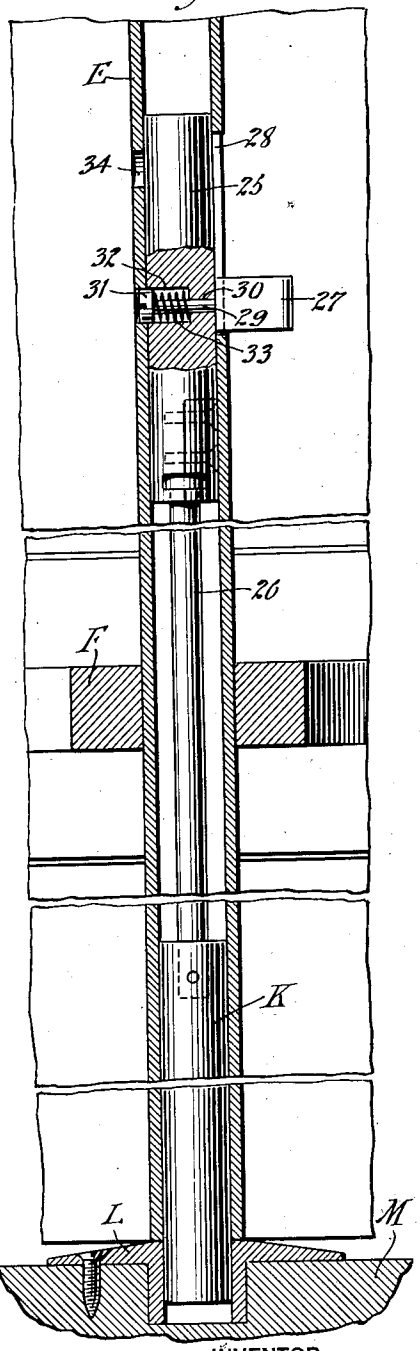
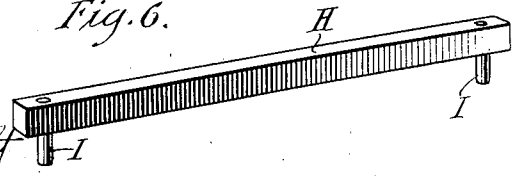


Fig. 6.



WITNESSES

Edw. Thorpe

Hugh R. Hall

INVENTOR

R. L. Blanchard

BY Munn & Co.

ATTORNEY

Patented July 3, 1934

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UNITED STATES PATENT OFFICE

1,965,449

SEMICOLLAPSIBLE REVOLVING DOOR STRUCTURE

Robert L. Blanchard, New York, N. Y., assignor to Van Kannel Revolving Door Company, New York, N. Y., a corporation of New Jersey

Application March 3, 1931, Serial No. 519,866

8 Claims. (Cl. 20—18)

This invention relates to revolving doors, and has particular reference to certain improvements in that type known as semi-collapsible doors, in which the wings or leaves are movable to positions in substantially the same plane and projecting in opposite directions from the central support or spindle.

The present invention aims to generally simplify and improve the construction of this class of revolving doors whereby they may be more economically produced, assembled and installed, while possessing all the attributes and advantages of revolving doors of this character.

More particularly, the invention resides in the provision of a novel design of hardware which serves to connect the door wings with and support the same from the central axis or spindle upon which the door rotates in the usual operation thereof, the parts of which hardware may be inexpensively machined and assembled and with which the door wings may be readily associated.

The invention further comprehends detent means embodied in the hardware which functions to retain the door wings in their normal radial relation against accidental and unintentional release in the normal operation of the door, while permitting of intentional movement of the wings to their folded or collapsed positions.

As a still further object, the invention contemplates an improved spindle centering bolt and actuating means therefor which serves to retain the centering bolt in either its active or inactive position.

With the above recited and other objects in view, reference is had to the following description and accompanying drawings, in which there is exhibited one example or embodiment of the invention, while the claims define the actual scope of the same.

In the drawings:

Figure 1 is a fragmentary vertical sectional view through a revolving door structure including the improved hardware constructed in accordance with the invention and showing the door wings in their normal radial positions, said section being taken approximately on the line indicated at 1—1 in Figure 2.

Figure 2 is a fragmentary enlarged sectional plan view taken approximately on the line indicated at 2—2 in Figure 1 and illustrating respectively in full and dotted lines the radial and folded positions of the wings.

Figure 3 is an enlarged fragmentary vertical sectional view taken approximately on the line indicated at 3—3 in Figure 2.

Figure 4 is an enlarged fragmentary horizontal sectional view taken approximately on the line indicated at 4—4 in Figure 1 and illustrating the door wings in their semi-collapsed or folded condition.

Figure 5 is a fragmentary vertical sectional view particularly illustrating the improved spindle centering bolt and actuating means therefor.

Figure 6 is a perspective view of one of the retaining bars for holding adjacent pairs of door wings in semi-collapsed condition.

Referring to the drawings by characters of reference, A, B, C and D designate the wings of a revolving door structure and while four have been illustrated, it is to be understood that within the scope of the invention, three or more wings may be employed without departing from the scope of the invention. As is customary in revolving doors, a central support or spindle designated generally by the reference character E is employed, which is suitably mounted for rotation, and from which spindle the door wings are supported for rotation therewith when disposed in radial relations.

The present invention has particularly to do with the hardware which serves to connect the door wings with and support the same from the central support or spindle so as to permit of the folding of the wings to what is known as a semi-collapsed condition, in which the wings or leaves while disposed in substantially the same plane project in opposite directions from the central support to afford clear passageways on opposite sides of the folded wings.

This hardware essentially consists of horizontally disposed radially projecting bearings designated generally by the reference character F, which are carried by and secured to the spindle or central support E for rotation therewith. The bearings F may be of any desired shape but as illustrated in the present disclosure, are cut or machined from a flat piece of stock which is centrally apertured at 10 to fit the spindle or central support E and which is keyed or otherwise secured thereto as at 11 for rotation with the spindle and suitably secured thereon against axial relative movement with respect to the spindle. The bearing F presents a plurality of radial arms 12 corresponding in number to the number of door wings employed, in the present showing, four.

The hardware further includes means for attaching and fulcruming each door wing for relative swinging movement with respect to the bear-

ing F, and said means includes a horizontally channeled member designated generally by the reference character G, which straddles each projection or arm 12 of the bearing and which is fulcrumed at its outer end to the free extremity of the projection or arm 12 by a vertical axis element 13 which extends through the terminal of the arm 12 and through the upper and lower walls 14 and 15 of the member G. The inner edge of each door wing is recessed or notched as at H to accommodate each member G, and the members G are fixedly secured to said wing by suitable means, such as a pair of spaced parallel escutcheon plates 16 carried by each member, overlying opposite sides of the door wing and preferably formed integral with the member. Securing means, such as screws, bolts or other equivalent elements 17 pass through the escutcheon plates. In this manner, it is apparent that the door wings A, B, C and D are supported for independent swinging movement with respect to each other and the bearings F, so that they may be moved from their normal full line position to the broken line semi-collapsed or folded condition illustrated in Figure 2.

In order to provide means embodied in the hardware which serves to retain the door wings in their normal radial positions against accidental or unintentional release in the normal operation of the door while permitting of intentional swinging movement of the wings to their folded or collapsed positions, cooperative detent means is provided which, as illustrated in the present instance, includes an apertured portion 18 of the upper wall 14 of each member G which constitutes a keeper. Each arm 12 of the bearing member F at a point coinciding with the aperture or keeper 18 and within the axis 13, is formed with a vertical bore 19, which from its lower end to a point closely adjacent its upper end is of a diameter exceeding that of the aperture 18. The upper end of the bore 19 is constricted as at 20 and serves to permit of but limit the projection therefrom of a portion of a spherical detent element 21 which is axially movable within the bore 19 and normally urged toward the constricted end by a coiled expansion spring 22. A removable plug 23 threadedly engages within the opposite end of the bore 19 and serves to hold the spring and detent within the bore. In practice, the curved or semi-spherical surface of the detent 21 normally projects into the keeper aperture 18 and functions to position the door wing in its normal radial relation while allowing upon the exertion of sufficient force, the swinging movement of the door wing to its collapsed or folded position. The curved or semi-spherical projecting surface also affords means engageable by the upper wall 14 of each member G which permits of the camming and retraction of the detent when moving the door wing from a folded position to its normal radial position or vice versa.

The construction of the hardware thus described admits of its initial assembly with the central support or spindle E and the subsequent application and securement of the door wings thereto, thereby effecting an economy in the installation of doors of this class. This construction also facilitates the gaining of access to the parts for the purpose of repair in event of breakage of the detents or their springs, as it is only necessary to swing the door and member G at an angle which will uncover the plug 23. In event of breakage of the fulcrum or axis member 13, it is, of course, essential to remove the door wing to replace this part.

The hardware thus described permits of movement of the door wings to a semi-collapsed or folded condition as illustrated in Figure 4, in which instance suitable retaining bars H having depending pins I may be associated with the apertured lugs J to hold each pair of aligned door wings in their semi-collapsed or folded condition.

As it is customary in revolving doors of this character to suspend the center spindle from an overhead support (not shown) so that with the door wings in folded or collapsed position, the same may be moved laterally to one side of the entrance passage, it is common to provide said center spindle with a centering bolt K which is projectable into and retractable from a step bearing L stationarily positioned in the floor M at the normal center of the axis of rotation of the door structure. In the present instance, an improved means has been provided for actuating the bolt K and for holding the same in its projected or retracted positions, which means consists of an actuator member 25 mounted for axial sliding movement within the tubular spindle E and connected by a connecting rod 26 with the bolt K. The actuator member 25 is provided with a radially projecting manipulating handle 27 which extends through a vertical or longitudinal slot 28 formed in the spindle E. The manipulating handle 27 is formed with an inwardly extending shank 29 which projects transversely through an opening 30 in the actuator member 25 and is provided with an enlarged head 31 which is guided for movement in a diametrically enlarged portion 32 of the opening 30. A coiled expansion spring 33 surrounds the shank 29 and is interposed between the enlarged head 31 and the shoulder formed by the juncture of the inner end of the diametrically enlarged portion 32 and the remaining reduced portion 30 of the transverse aperture. In practice, the spring normally serves to project the enlarged head 31 selectively into one of a pair of vertically spaced keeper apertures 34 and 35 of the spindle E. When the head 31 is in the keeper aperture 35, the centering bolt K is maintained in its projected active position engaging within the step bearing L. When it is desired to retract the centering bolt K, the manipulating handle 27 is pulled outwardly against the action of the spring 33, thus retracting the head 31 from the aperture 35, so that the handle 27 may be employed for shifting the actuator member 25 upwardly and, consequently, retracting the centering bolt K from the step bearing L. When the head 31 registers with the keeper opening 34, the spring forces the head 31 into the aperture 34 and the bolt is thus held in its retracted inactive position.

While a preferred embodiment of the invention has been disclosed herein, it is to be clearly understood that the same is merely illustrative of one way in which the invention may be reduced to practice, and the right is reserved to variations and modifications thereof which properly fall within the scope of the appended claims.

What is claimed is:

1. In a semi-collapsible revolving door structure, door wing mounting hardware including horizontally disposed and radially projecting rigid bearings on the central support, a horizontally channeled member straddling each projection, and fixedly fulcrumed to its outer end and recessed in the inner edge of the door wing, each bearing and member having independent cooper-

ating detent means for holding the door wings in their normal radial position.

2. In a semi-collapsible revolving door structure, door wing mounting hardware including horizontally disposed and radially projecting rigid bearings on the central support, a horizontally channeled member having portions thereof straddling each projection and fixedly fulcrumed thereto near the outer end of said projection and recessed in the inner edge of the door wing, each bearing and member having independent cooperating detent means for holding the door wings in their normal radial position, said means consisting of an apertured keeper portion of the member and a spring pressed element disposed within the confines of the bearing having a portion thereof normally projected therefrom for reception by the apertured keeper portion.

3. Door wing mounting hardware for semi-collapsible doors including an element secured to the door spindle and fashioned to provide radially-extending rigid bearing arms, a horizontally channeled member fitted over each arm and adapted to be recessed in the inner edge of the door wing, a fixed vertical fulcrum extending through the arm terminal and said member and a pair of spaced parallel escutcheon plates carried by each member to overlie the opposite sides of the door wing for receiving means to secure the wing thereto.

4. Door wing mounting hardware for semi-collapsible doors including an element secured to the door spindle and fashioned to provide radially-extending rigid bearing arms, a horizontally channeled member fitted over each arm and adapted to be recessed in the inner edge of the door wing, a fixed vertical fulcrum extending through the arm terminal and said member and a pair of spaced parallel escutcheon plates carried by each member to overlie the opposite sides of the door wing for receiving means to secure the wing thereto, each member and bearing arm having cooperating means located between the fulcrum and the door spindle for holding the members in a position to dispose the door wing radial to the axis of rotation of the spindle.

5. Door-wing-mounting hardware for semi-collapsible revolving doors having a spindle, including a support for the doors, said support comprising an element adapted to be secured upon the spindle and having four radially-extending rigid arms in the same plane with their free ends spaced equi-distant with respect to each other, a fulcrum means on each arm adjacent the free ends thereof, said arms each having an aperture extending therethrough intermediate the fulcrum means and the fixed end of each of the arms, internal threads at one end of each of the apertures, shoulders at the other end of each of the apertures restricting the same, a detent element for engagement with each wing carried in the aperture of each of said arms and movable therein, each of said detent elements having a substantially spheroidal portion normally projecting from the apertures at the restricted ends thereof, an expansive spring within each of the apertures for normally urging the substantially spheroidal portions to project from the apertures for engagement with the wings to normally hold them in alignment with their respective arms, said shoulders serving to limit the movement of the detent element, and a threaded plug for each of the apertures engaging with the threads thereof for retaining the springs within the apertures and for adjusting the expansive pressure of each of the springs, the arrangement being such that when the hardware is in use the wings or any of them may be swung upon said fulcrum means to disengage the wings from the detent means and when the wings have been swung clear of the detent the plug will be accessible for removal and/or replacement of the detent and/or spring and/or for adjustment of the spring without necessitating removal of the wings from the support.

6. The combination in a semi-collapsible revolving door having a spindle, of a door-wing mounting support therefor, including an element having horizontal radially-extending rigid arms in the same plane with their free ends spaced equi-distant with respect to each other, a vertical fulcrum on each arm adjacent the free end thereof for pivotally mounting the door-wings, said arms each having a vertical aperture extending therethrough, a detent element in the aperture of each of said arms and vertically movable therein, each of said detent elements having a cam portion normally projecting from one end of each of the apertures and engageable in the door wings for normally holding the same in extended positions aligned with their respective arms, a resilient member within each of the apertures for positioning the detent elements, and means within and adjacent the opposite end of each of the apertures for retaining and adjusting the resilient members, the parts being so constructed and arranged that the wings or any of them may be swung upon their vertical fulcrums to disengage the wings from the detent by camming the same within the vertical apertures by the swinging of the wings and when the wings have been swung clear of the detent the retaining and adjusting means will be accessible without necessitating the removal of the wings from their respective arms.

7. Door-wing-mounting support for semi-collapsible revolving doors, including a support for the door having radially-extending rigid arms in the same plane with their free ends spaced equi-distant with respect to each other, a fulcrum means on each arm adjacent the free end thereof, said arms each having an aperture extending therethrough intermediate the fulcrum means and the fixed end of the arms, the apertures at one of their ends being restricted, a detent element in the aperture of each of said arms and movable therein, each of said detent elements having a substantially spheroidal portion normally projecting from the apertures at the restricted ends thereof, the restricted ends of the apertures serving as stops and limiting the amount of projection of the substantially spheroidal portion, a resilient member within each of the apertures for normally urging the substantially spheroidal portions to project from the apertures for engagement with the wings, and means for each of the apertures for retaining and adjusting the resilient members, the arrangement being such that when the hardware is in use the wings or any of them may be swung upon said fulcrum means to disengage the wing from the detent means and when the wing has been swung clear of the detent the plug will be accessible for replacement and/or adjustment of the resilient member without necessitating removal of the wing from the support.

8. Door-wing-mounting hardware for semi-collapsible revolving doors including a support for the doors having radially-extending arms provided with apertured portions, a fulcrum

means on each arm, a detent movably carried by the apertured portion of each arm and projecting partially therefrom, means for normally urging said detents to said partially projected position, and means for retaining the detent with respect to the said urging means within the apertured portion, the arrangement being such that when the hardware is in use the wings or any of them may be swung upon said fulcrum means to disengage the wing from the detent and when the wings have been swung clear of the detent the retaining means will be accessible for removal and/or replacement of the detent and/or urging means without necessitating removal of the wings from the support.

ROBERT L. BLANCHARD.