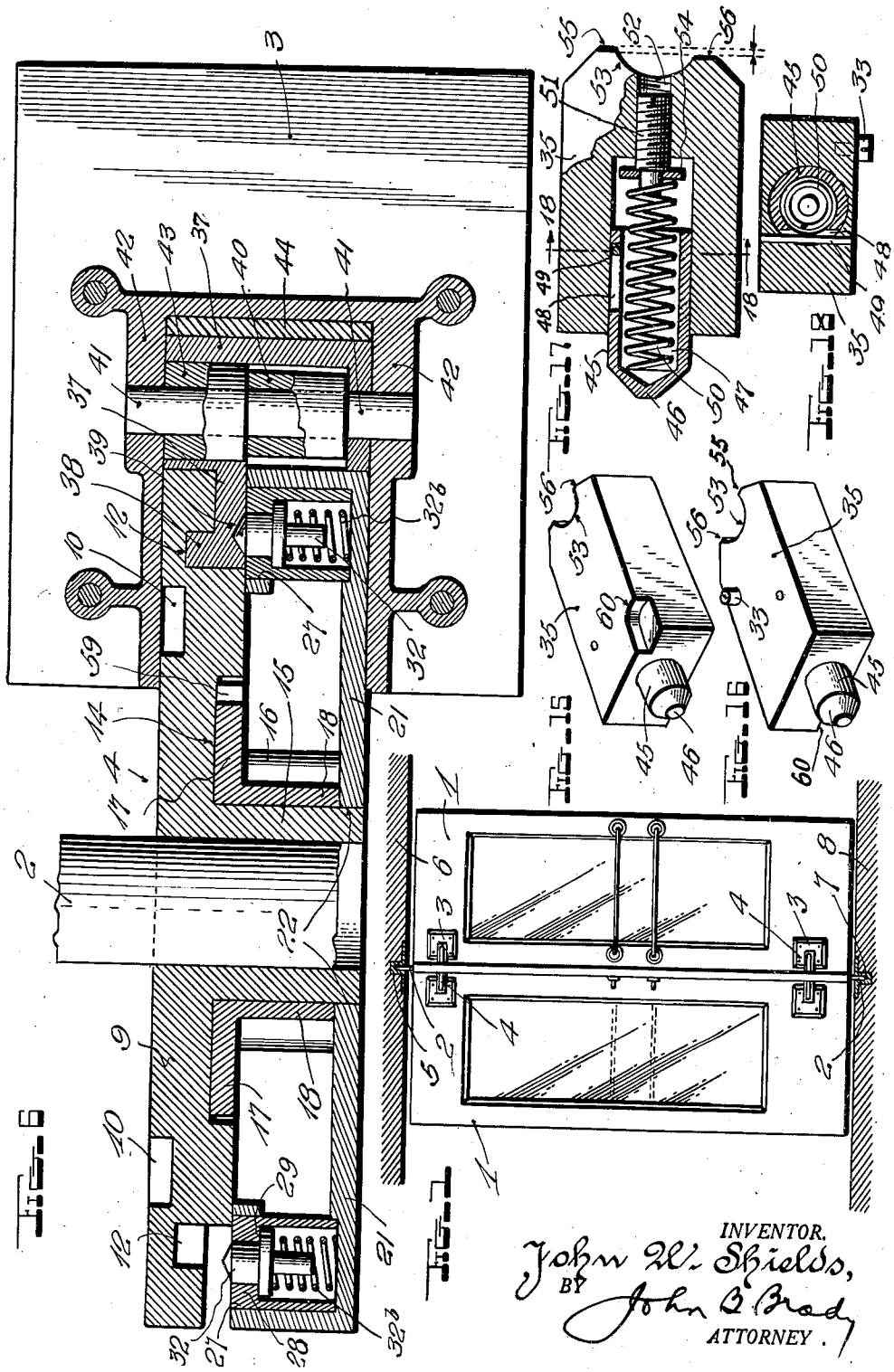
April 19, 1938. J. W. SHIELDS 2,114,405

REVOLVING DOOR MECHANISM

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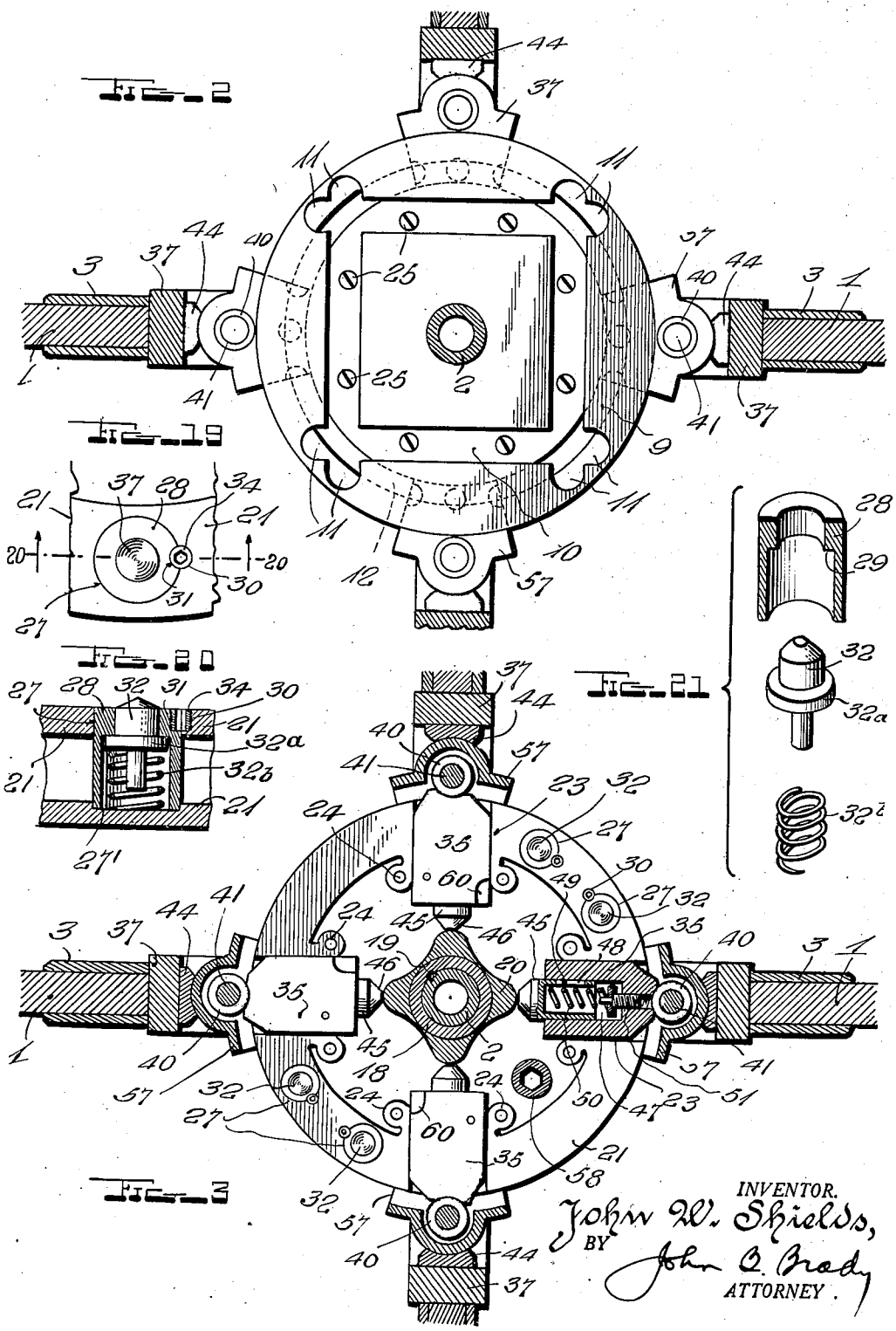


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REVOLVING DOOR MECHANISM

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REVOLVING DOOR MECHANISM

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Fig. 4

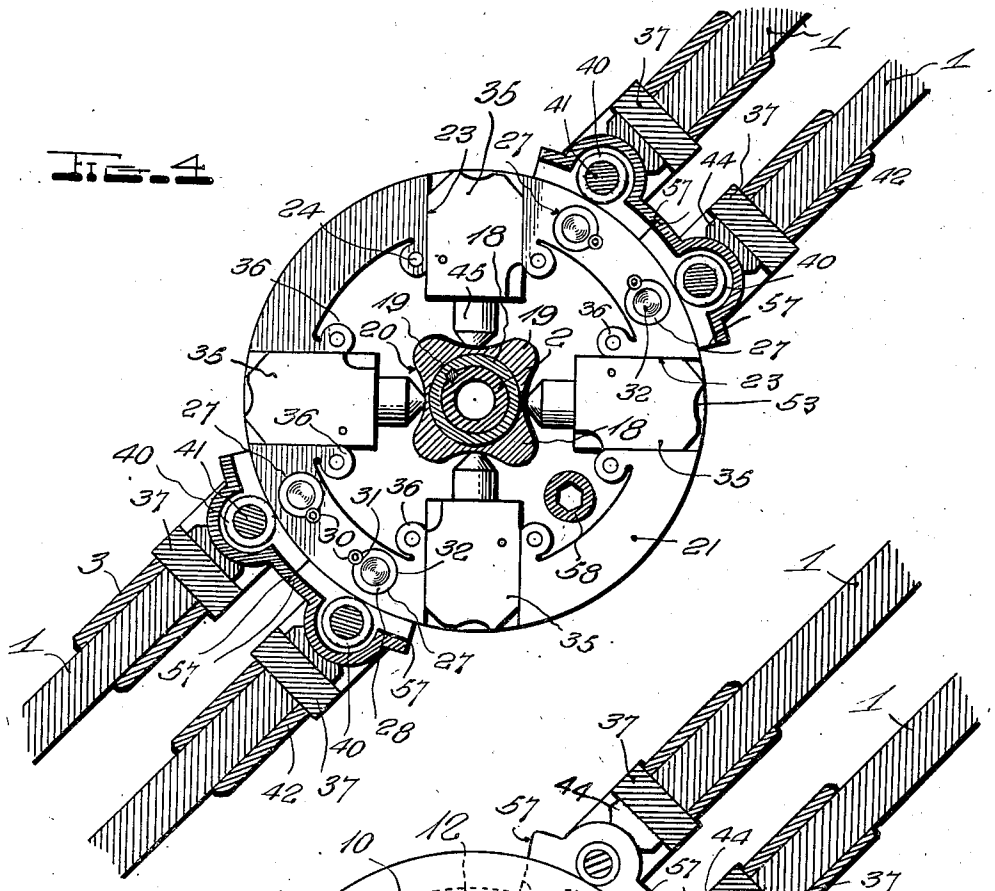
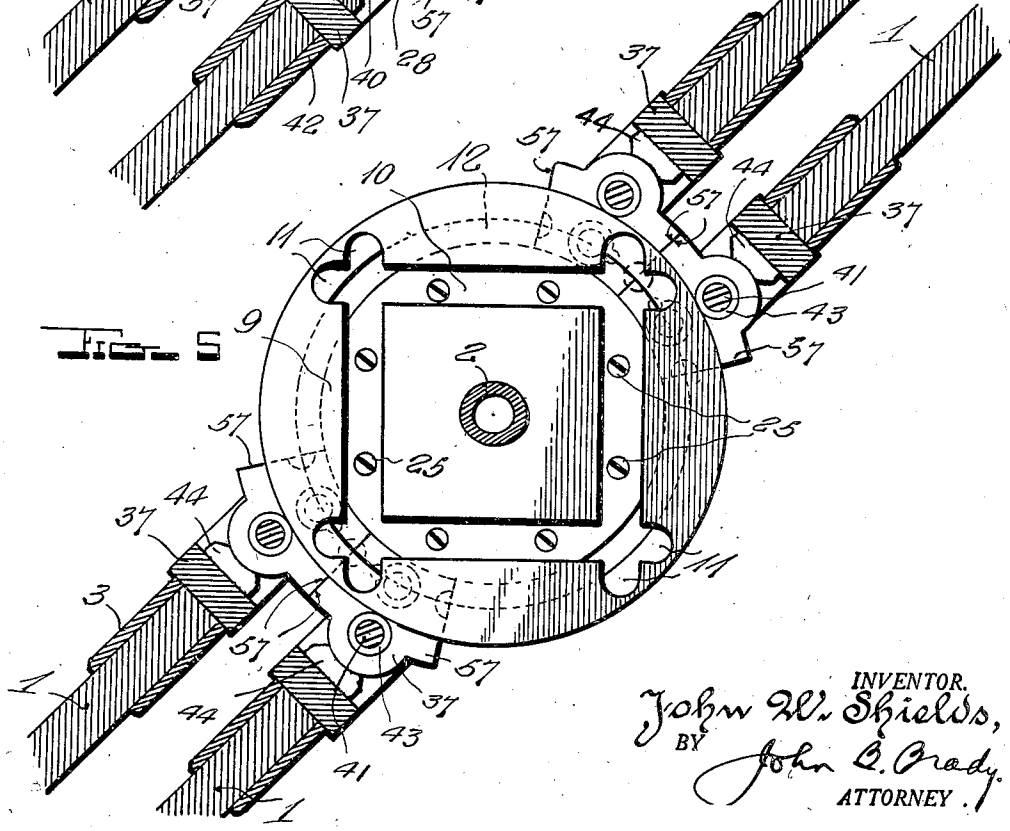


Fig. 5



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Fig. 7

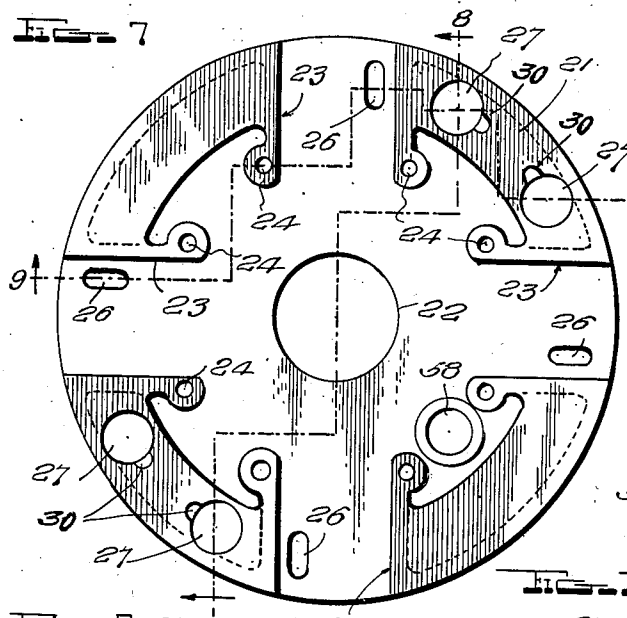


Fig. 8

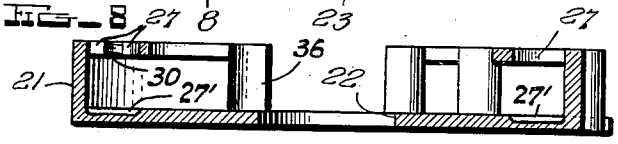


Fig. 9

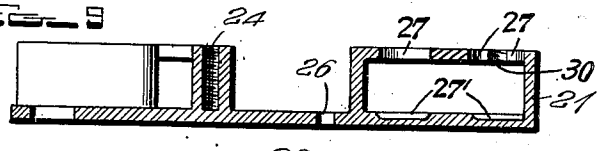


Fig. 10

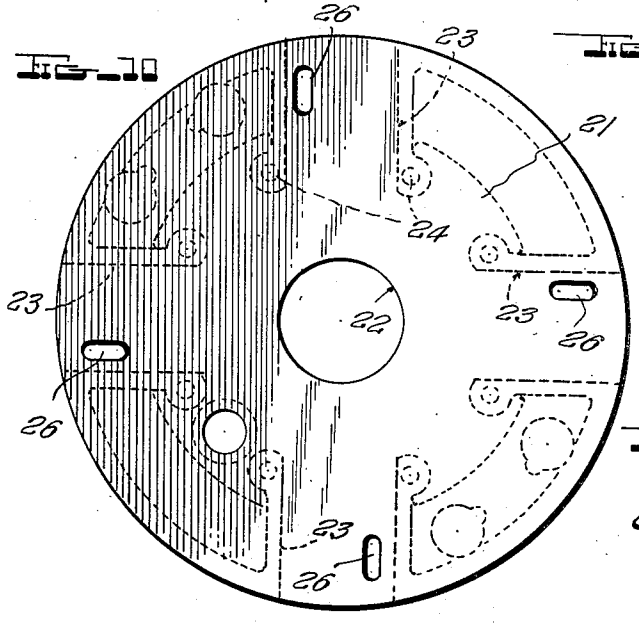


Fig. 11

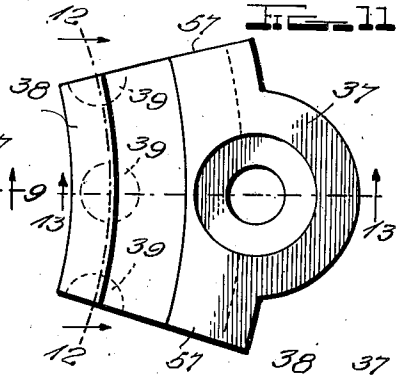


Fig. 12

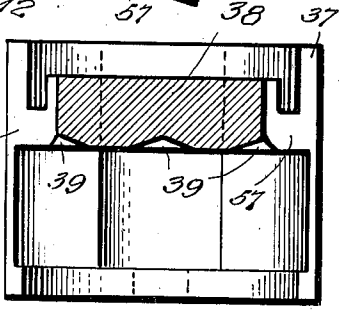


Fig. 13

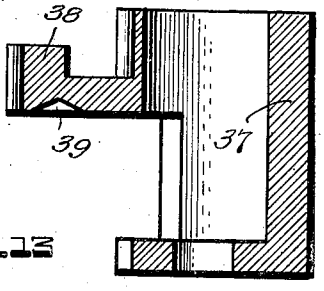
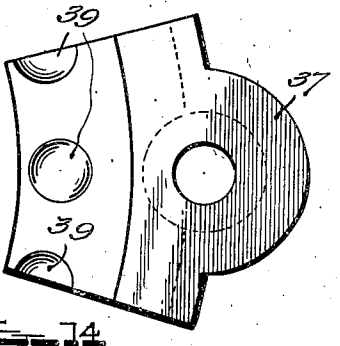


Fig. 14



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2,114,405

UNITED STATES PATENT OFFICE

2,114,405

REVOLVING DOOR MECHANISM

John W. Shields, Evansville, Ind., assignor to International Door Company, Evansville, Ind., a corporation of Illinois

Application February 12, 1937, Serial No. 125,508

8 Claims. (Cl. 20—18)

My invention relates broadly to revolving doors and more particularly to an improved construction of panic release revolving door hardware.

One of the objects of my invention is to provide an improved construction of revolving door hardware which is capable of quick-release of the revolving door wings from radial position to collapsed position under conditions of panic.

Another object of my invention is to provide a construction of revolving door hardware including roller latching mechanism operative to present less resistance to a collapsing operation under conditions of force exerted in one direction than under conditions of force exerted in an opposite direction.

Still another object of my invention is to provide a construction of roller latching revolving door mechanism having abutment means operating differentially according to the direction of the force applied against the associated revolving door wing for controlling the resistance of the revolving door wing to a collapsing operation.

A further object of my invention is to provide a construction of revolving door mechanism including a roller latching device operative with respect to each of the revolving door wings in which the latching faces of each latching device offer different degrees of resistance to the collapsing of the associated revolving door wing.

A still further object of my invention is to provide a revolving door mechanism by which the wings of the revolving door may be shifted to collapsed position and maintained in such collapsed position without the use of a folding bar.

Still another object of my invention is to provide means in a revolving door mechanism for latching the revolving door wings either in normal position or collapsed position.

A further object of my invention is to provide a construction of revolving door hardware in which the revolving door wings are supported on sliding axle journal members which are each adapted to be positively latched in a position corresponding to the collapsed position of the revolving door wings when the revolving wings are shifted to collapsed position.

Other and further objects of my invention reside in an improved construction of revolving door hardware as will be set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is an elevational view of a revolving door equipped with the improved panic release mechanism of my invention; Fig. 2 is a horizontal sectional view of the revolving door hardware of my invention; Fig. 3 is a similar view showing more particularly the wing latching means; Figs. 4 and 5 are similar views showing the wings released and held in position by the spring pressed plungers entering recesses within the sockets carried by the door hangers; Fig. 6 is a detail vertical section on an enlarged scale showing more particularly the coacting elements and spring pressed plungers; Fig. 7 is a top plan view of the housing for the revolving door hardware; Fig. 8 is a transverse vertical section taken on line 8—8 of Fig. 7; Fig. 9 is a transverse section taken on line 9—9 of Fig. 7; Fig. 10 is a bottom plan view of the housing shown in Fig. 7; Fig. 11 is a top plan view of one of the sliding axle journal members indicating the recesses adapted to be engaged by the spring pressed plungers; Fig. 12 is a transverse vertical section taken on line 12—12 of Fig. 11; Fig. 13 is a transverse vertical section taken on line 13—13 of Fig. 11; Fig. 14 is a bottom plan view of the sliding axle journal member shown in Fig. 11 and illustrating the recesses in full line therein; Figs. 15 and 16 are perspective views, top and bottom, respectively, of the radially movable latching members; Fig. 17 is a top plan view partially in section of one of the latching members; Fig. 18 is a transverse vertical section taken on line 18—18 of Fig. 17; Fig. 19 is a fragmentary detail view of one of the spring pressed actuating plungers; Fig. 20 is a transverse section taken on line 20—20 of Fig. 19; and Fig. 21 is a perspective view partially in section showing the parts comprising the spring pressed latching plungers in position ready for assembly.

My invention is directed to an improved construction of revolving door mechanism which is a substantial improvement over the structures set forth in my copending application 757,941, filed December 17, 1934, for Revolving door hardware, now Patent 2,081,774, issued May 25, 1937, and my Patent 2,055,828, issued September 29, 1936, for Revolving door mechanism.

In the improved construction of my invention, I provide improved constructions of spring pressed sliding wing latching members in which the coacting latching faces thereof are prepared in a very special manner. The projection of one latching face is foreshortened with respect to the projection of a coacting latching face. The revolving door normally revolves in a counterclockwise direction. The sliding wing latching block has its foreshortened side so disposed as to resist clockwise rotation. The face on the sliding wing latching block which projects beyond the

foreshortened coacting face is disposed to resist counterclockwise rotation of the revolving door. Accordingly, a more substantial abutment is provided for resisting collapse of the revolving door in a counterclockwise direction than is provided for resisting collapse in a clockwise rotation of the revolving door. The reason for this is to provide additional resistance to overcome the shocks received when persons passing through the revolving door undertake to rush or accelerate the door too rapidly. There is still another reason for more forcibly resisting the collapse of the door in one direction than the other. In large buildings where a draft is created by the chimney effect, the revolving door mechanism is called upon to withstand additional pressure due to this draft velocity. With the revolving door wings set to overcome the draft velocity and not collapse with undue pressure, the door then is not panic proof, but with the above arrangement the door will collapse when pressure is exerted against two wings simultaneously. In case of panic, there is pressure on two wings and this being in opposite directions, one in a counterclockwise direction and the other clockwise, the clockwise wing will collapse and thus release the other four wings.

In the improved construction of my invention, I provide pairs of detents located in diametrically opposite positions on opposite sides of the central axis of the revolving door shaft and peripherally spaced in the housing of the revolving door mechanism for a distance substantially equal to the distance between centers of the sliding axle journal members which are engaged between wing hangers. The sliding axle journal members are each provided with socket recesses adapted to coact with the detents carried by the housing of the revolving door mechanism. When the wings have been shifted to collapsed position, the sliding axle journal members snap into position by reason of the engagement of the spring pressed detents with the sockets in the sliding axle journal members. This latching function of the detents with respect to the sliding axle journal members provides for the position latching of two wings each way and maintains the wings in collapsed position so that the entire revolving door structure may be rolled to one side of the revolving door enclosure, thus taking the revolving door out of service.

This arrangement has a distinct advantage over the structures of my aforementioned patents because it is unnecessary to provide a folding bar to hold the door in collapsed position. It will be appreciated that in the structures of my prior applications, it is necessary to collapse the doors in such a position with respect to the supporting discs that a folding bar may be inserted in position for maintaining the revolving doors in collapsed position. It will be appreciated that there is only one position in which the doors may be collapsed when they are to be maintained in position by a folding bar, as a folding bar must fit into coacting recesses in the revolving door mechanism housing with which the revolving door wings have been properly aligned.

Moreover in the structure of my present invention, the detents enter recesses in the sliding axle journal members for yieldably and positively maintaining the sliding axle journal members in collapsed position, as distinguished from the relatively uncontrolled position of the revolving door wings in the structures of my prior patents. That is to say, I provide yieldable and positive means for maintaining the position of the door wings when collapsed. The reassembly of the door wings in proper alignment for normal operation of the revolving door is readily accomplished by moving the wings to release the yieldable latching means for restoring the door wings to roller latching normal position.

The several improved features herein set forth, combine to provide a highly convenient and desirable construction of revolving door mechanism which is capable of manufacture on a quantity basis with a high degree of uniformity of parts and efficiency in operation.

Referring to the drawings in more detail, reference character 1 designates the revolving door wings of a revolving door assembly. The door wings are supported with respect to the revolving door shaft 2 by means of hangers 3 and coacting disc structure 4. The revolving door shaft is mounted between upper journal 5 in ceiling structure 6 and lower journal 7 in floor structure 8. The manner of mounting the revolving door shaft is entirely schematic and may take various forms.

The revolving door hardware designated generally by the disc structure 4 comprises disc member 9 having quadri-laterally shaped grooves 10 therein. The quadri-laterally shaped grooves 10 overlap each other in the corners at 11. There is an annular groove 12 beneath the disc member 9. The disc member 9 also has a central circular recess 14 beneath the disc member for receiving the plate portion 17 of the angularly shiftable cam member 16. The cam member 16 has a cylindrical central sleeve portion 18 as shown more particularly in Fig. 6. The sleeve portion 18 of cam member 16 is concentrically disposed about a cylindrical central sleeve portion 15 of the disc member 9 and is angularly shiftable with respect thereto. I provide a key 19 fitting into a groove in sleeve portion 18 of cam member 16 and a groove in shaft 2.

The sleeve portion 18 of the cam member 16 carries diametrically opposite sets of cam faces 20 which are adapted to coact with the radially shiftable latching members 35 shown more fully in Figs. 15–18 and assembled as in Fig. 3.

The revolving door hardware includes a coacting housing 21 aligned with disc member 9. There is a central aperture 22 in housing 21, the inner periphery of which abuts with the sleeve portion 15 of disc member 9. The coacting housing 21 contains a plurality of radially disposed guide pockets 23 for the latching members 35. There are screw threaded recesses 24 in lug portions 36 integral with housing 21 for receiving screws 25 extending through disc member 9 by which the assembly is maintained in a unitary structure. There are guide slots 26 located in housing 21 adjacent one side of the path of movement of radially shiftable members 35 into which the screw threaded pin member 33 extends for limiting the movement of the radially shiftable member 35.

The housing 21 is provided with pairs of cylindrical openings 27 and aligned recesses 27′ arranged on vertical axes and in diametrically opposite quadrants of the housing as shown more particularly in Figs. 3 and 4. Each of the cylindrical openings 27 is provided with a sleeve 28 inserted therein and serving as a housing for a spring pressed detent illustrated more particularly in Figs. 19, 20 and 21. The spring pressed detent is designated at 32 fitting within the sleeve 28 and having a shoulder 32a against which a coil spring 32b is effective for urging

the detent 32 into an upwardly projected position. The sleeve 28 has an internal annular shoulder 29 against which the annular shoulder 32a of detent 32 is adapted to abut when the detent is in an upwardly projected position. I provide a semi-cylindrical screwthreaded recess 31 adjacent the periphery of sleeve 28 which is adapted to be aligned with the semi-cylindrical screwthreaded recess 30 in housing 21 to provide a substantially cylindrical screwthreaded recess for receiving the lock screw 34. It is thus possible to confine the sleeve housings 28 for the detents 32 in housing 21.

As heretofore pointed out, the openings 27 in housing 23 are arranged in pairs and disposed in opposite quadrantal portions of the housing. It is thus possible to locate the detents 32 in opposite quadrantal portions of the housing for enabling the sliding axle journal boxes 37 which are individual to each revolving door wing to be shifted to a position in which the revolving door wings are disposed in parallel relation. The sliding axle journal boxes are constructed as shown more particularly in Figs. 11–13. Each sliding axle journal box includes an upstanding groove engaging portion 38 adapted to slide in the annular groove 12 in member 9. Each sliding axle journal box carries sets of recesses 39 adapted to coact with the detents 32 in housing 21 for latching the door wings in position when the wings are shifted to the quadrants occupied by the detents. The door wings are shown in latched position in Figs. 4 and 5.

The sliding axle journal boxes are each constructed to form a housing for a roller 40 which is rotatably mounted on pin 41, as shown more particularly in Fig. 6. Pin 41 is mounted in the wing hanger 42 and extends through the sliding axle journal box individual to each door wing. A sleeve 43 is provided on pin 41. The rollers 40 coact with the latching faces of the respective plungers 35. I provide a filler block 44 intermediate the roller latching member 40 and the vertically extending portion of the sliding axle journal box 37.

The revolving door wings 1 are carried in the wing hangers 3 supported by the hardware 42 thereof in the usual manner.

The plunger 35, which is shifted within limits imposed by the engagement of pin 33 on plunger 35, operating on slot 26 in housing 21, is provided with a central radially projectible pin 45 having a substantially frusto-conical end 46 and a substantially hollow cylindrical internal portion 47. The plunger 35 has a notched corner portion 60 as illustrated more fully in Figs. 3 and 15. A slot 48 is provided in one side of pin 45 through which the confining member 49 extends limiting the travel of pin 45. A coil spring 50 is disposed interiorly of pin 45 and exerts a pressure thereon, tending to continuously urge pin 45 radially outward under control of adjusting screw 51 which is screwthreaded through screwthreaded aperture 52 in the central face 53 of the plunger 35. A flange member 54 supported on the end of the adjusting screw 51 serves as an abutment or support for the end of coil spring 50.

The plunger 35 has three actuating faces, that is, the central face 53, the outwardly projecting end face 55, and the outwardly projecting end face 56. The outwardly projecting face 55 projects a greater distance than does the outwardly projecting face 56. That is, the face 56 is foreshortened with respect to the coacting face 55. The revolving door normally revolves in a counterclockwise direction. Plunger member 35 has its foreshortened face 56 so disposed as to resist clockwise rotation. The face 55 is so disposed as to resist counterclockwise rotation. The radially projecting face 55 provides a more substantial abutment for resisting collapse of the revolving door in a counterclockwise direction than is provided for foreshortened face 56 for resisting collapse in a clockwise direction.

Under conditions of panic, the revolving door wings may be collapsed by exerting abnormal pressure against two diametrically opposite wings which shifts the frusto-conical end portions 46 or pins 45 out of engagement with the cam faces 20 on cam member 16 simultaneously allowing disengagement of the roller latches on all of the doors. The revolving door wings may now be moved to a bookfold or to full collapsed parallel arrangement, illustrated in Figs. 4 and 5.

When shifted to the parallel arrangement shown in Figs. 4 and 5, the side faces 57 of each of the sliding axle journal boxes 37 constitute abutment means serving as spacers or limiting stops for the revolving door wings, which when moved to parallel collapsed position, illustrated in Figs. 4 and 5 prevent movement beyond a collapsed parallel position. Thus the revolving door wings may be positively maintained in collapsed position by virtue of the action of the detents 32 in recesses 39. The collapsed doors may be readily assembled, however, when the revolving door structure is shifted to the central position in the door drum and the wings moved to radial position by disengagement of detents 32 from recesses 39 and the latching of plunger faces 53 with respect to the roller members 40. The cam member 16 may be restored to roller latching position by insertion of a suitable wrench through socket 58 for angularly shifting a pinion with respect to the toothed peripheral portion 59 of the plate portion 17 of cam member 16. By this means the cam faces 20 are angularly shifted into a position abutting with the inner frusto-conical ends 46 of the pins 45. That is to say, the cam member 16 is shifted from the position illustrated in Fig. 4 in which the plunger members are disposed wholly within the housing 21 to the position illustrated in Fig. 3 in which the plunger members are projected for maintaining the roller latching mechanism in engaged position.

I have found the revolving door mechanism of my invention highly practical in manufacture, production and use. While I have described certain preferred embodiments of my invention, I desire that it be understood that modifications may be made and that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. Revolving door mechanism comprising a housing structure, a multiplicity of radially displaceable latch members mounted in said housing structure, wing hangers having roller members connected thereto, said latch members being engageable with said roller members, and means on said latch members for offering greater resistance against displacement of said roller members under a force exerted in one direction than with respect to a force exerted in an opposite direction.

2. Revolving door mechanism comprising in combination with a revolving door housing, a

multiplicity of wings, roller members connected with the wings, a multiplicity of movable latch members radially movable in an inward direction in said housing, said latch members each having a pair of latching faces offering differing degrees of restraint to the displacement of said roller members connected with the wings.

3. Revolving door mechanism comprising a housing structure, a multiplicity of radially displaceable latch members mounted in said housing structure, wing hangers having roller members connected thereto, said latch members being engageable with said roller members, a pair of projecting faces on each of said latch members for embracing a roller member individual to each wing hanger, one of said faces being longer than the other.

4. Revolving door mechanism comprising a housing structure, a multiplicity of radially displaceable latch members mounted in said housing structure, wing hangers having roller members connected thereto, said latch members being engageable with said roller members, a central semi-cylindrical face on each of said latch members coacting with a roller member individual to each wing hanger, and an abutting face projecting from said latch member on either side of said central semi-cylindrical face, the projection of one abutting face being greater than the projection of the other abutting face.

5. Revolving door hardware comprising a housing structure, a multiplicity of revolving door wings pivotally mounted with respect to said housing structure for movement from radial positions to a collapsed parallel position, and means for positively maintaining said door wings in collapsed position comprising spring actuated detents operatively disposed between parts of said housing and parts of said door wings.

6. Revolving door hardware comprising a disc mechanism, a plurality of revolving door wings shiftable to either radial or collapsed position relative to said disc mechanism, a sliding member individual to each of said wings and engageable with said disc mechanism, an abutting face on each side of each of said sliding members providing a limiting stop for the door wings when moved to collapsed position, and spring actuated detents interposed between the disc mechanism and each sliding member for maintaining said sliding members in the position to which said wings are moved in the collapsing operation with the abutting face on one side of one sliding member in abutting contact with the abutting face on the adjacent sliding member.

7. Revolving door hardware comprising a disc mechanism, a plurality of revolving door wings shiftable to either radial or collapsed position relative to said disc mechanism, a sliding member individual to each of said wings and engageable with said disc mechanism, an abutting face on each side of each of said sliding members providing a limiting stop for the door wings when moved to collapsed position, and means interposed between the disc mechanism and each sliding member for maintaining said sliding members in the position to which the wings are moved in the collapsing operation with the abutting face on one side of one sliding member in abutting contact with the abutting face on the adjacent sliding member.

8. Revolving door hardware comprising in combination with a housing enclosing latching mechanism for revolving door wings, sets of spring actuated detents carried by said housing in opposite quadrantal portions thereof and operative for maintaining the revolving door wings in collapsed position when the door wings are shifted to parallel position from radial position.

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