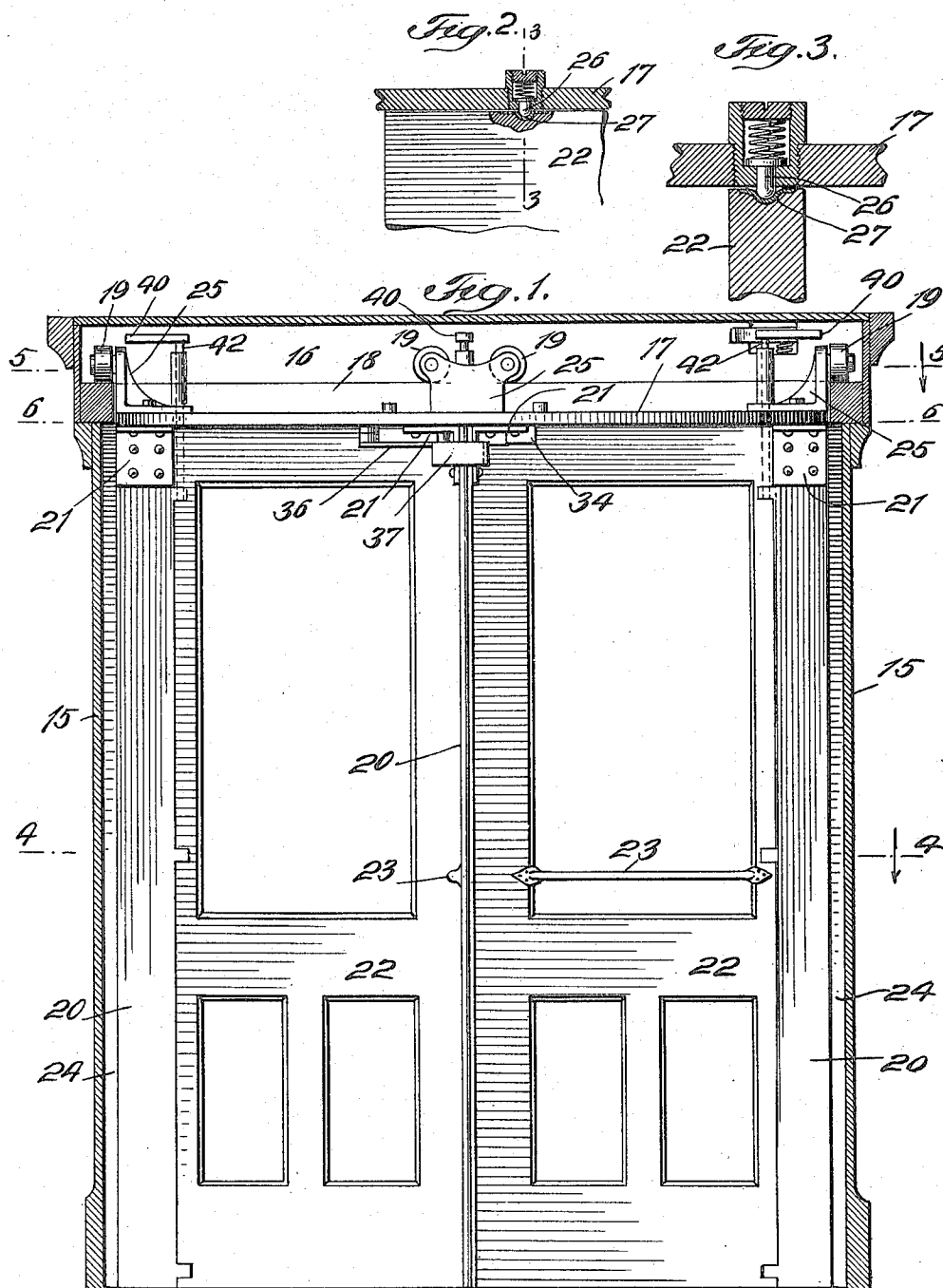


1,202,801.

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REVOLVING DOOR.
APPLICATION FILED MAR. 10, 1915.

Patented Oct. 31, 1916.
4 SHEETS—SHEET 1.



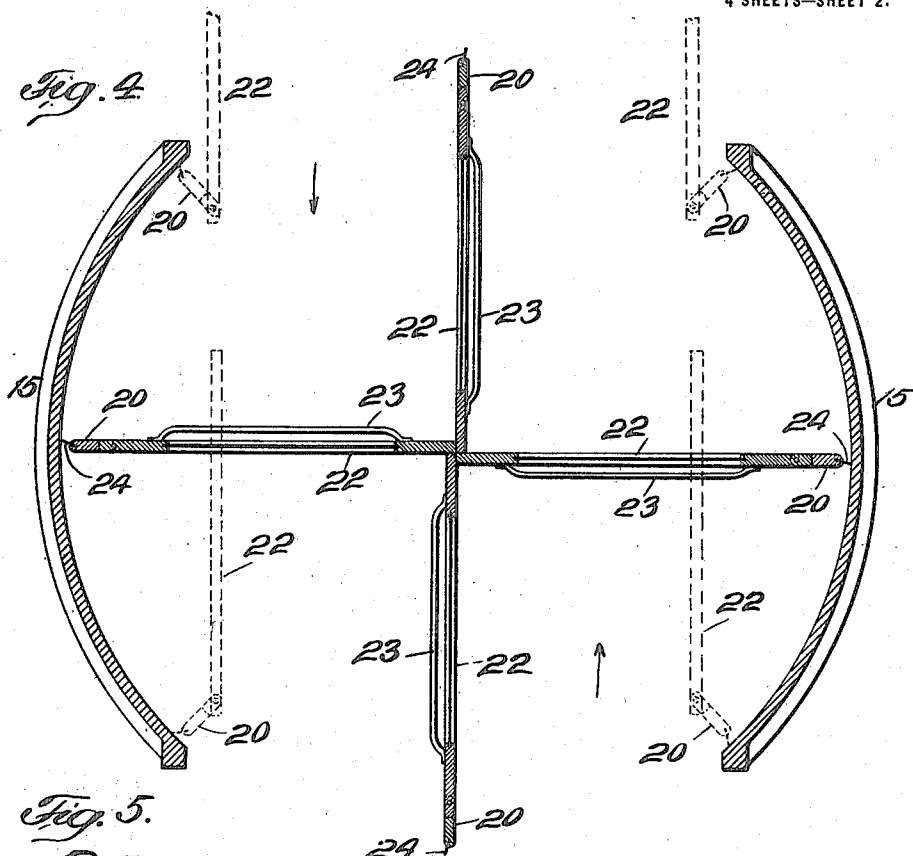
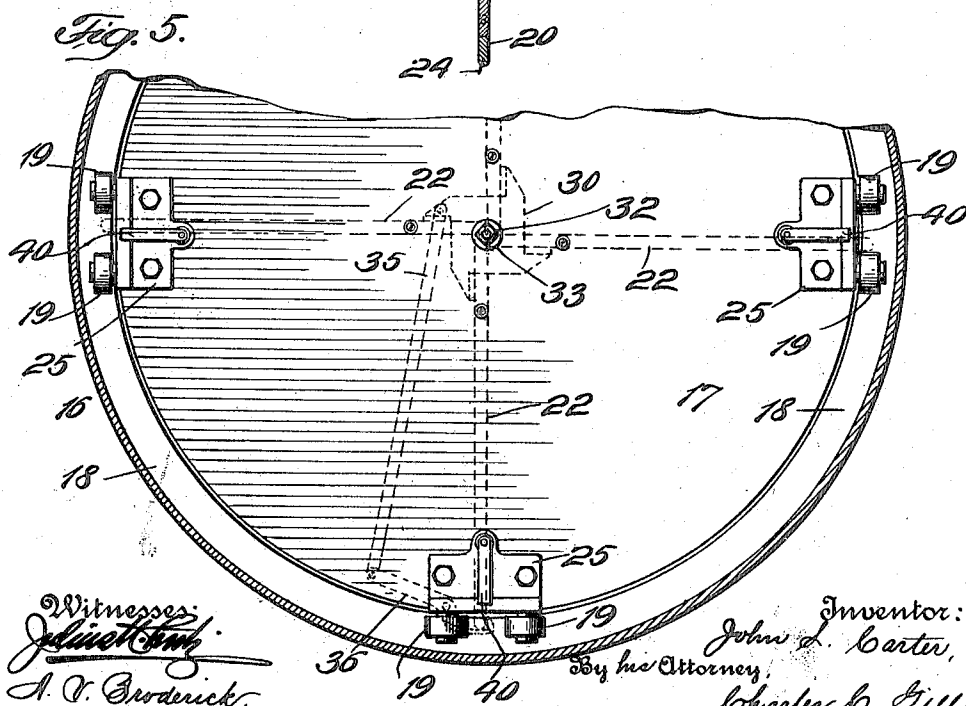
Witnesses:
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Inventor:
John L. Carter
By his Attorney,
Charles C. Gill

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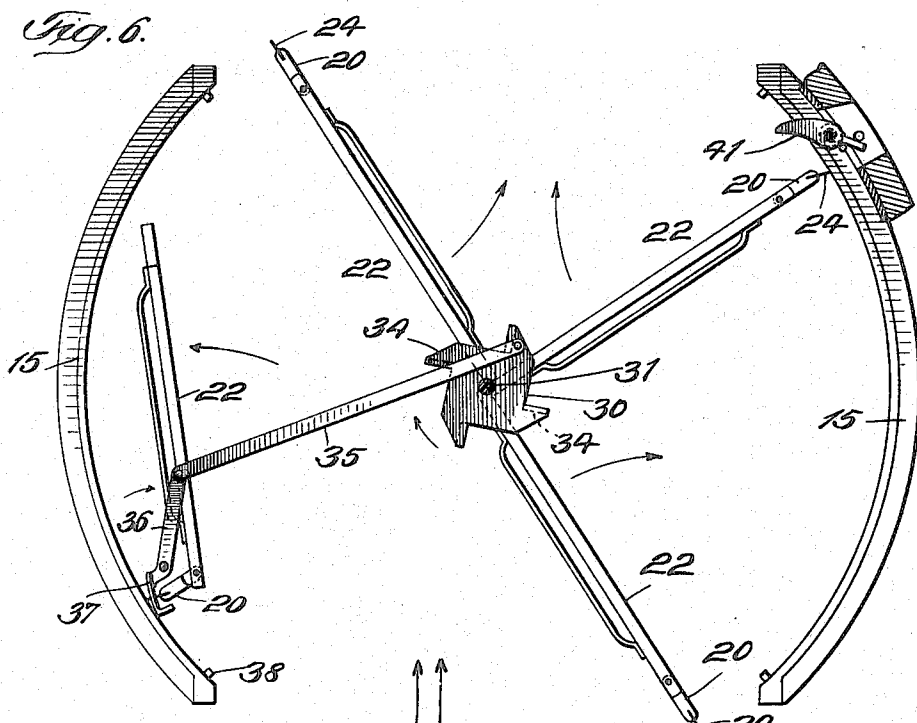
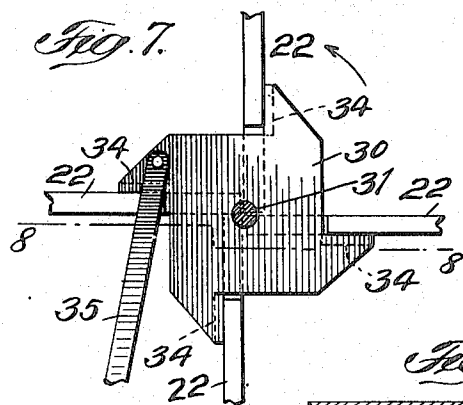
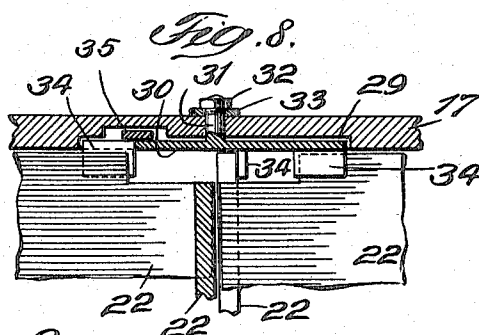
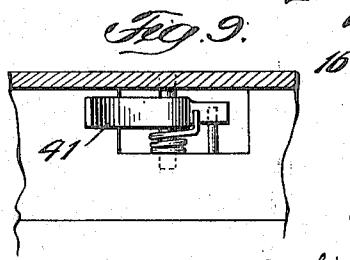
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4 SHEETS—SHEET 3.



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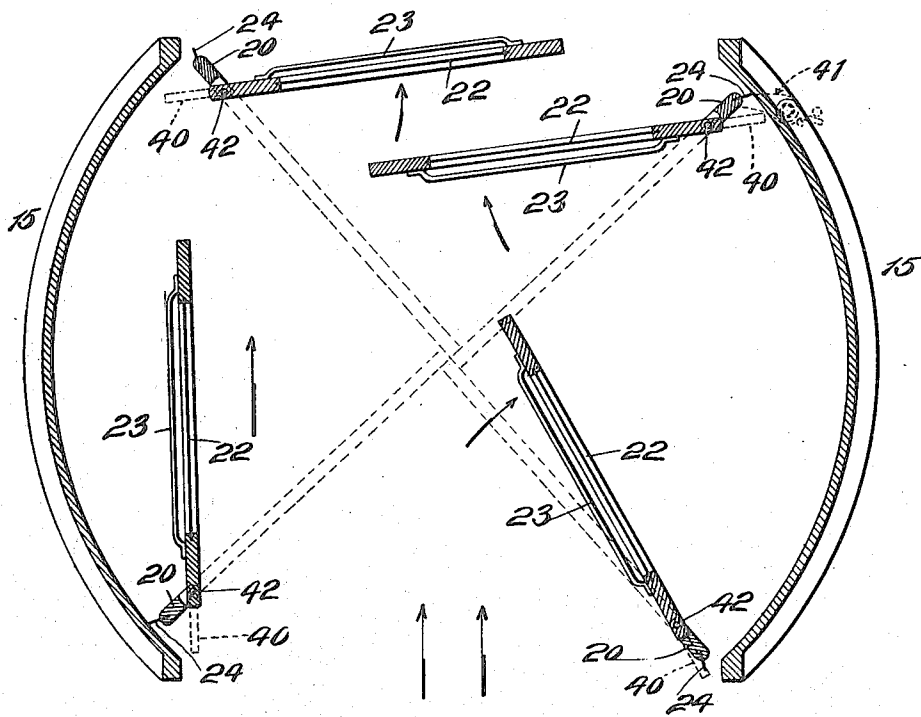
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4 SHEETS—SHEET 4.

Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN L. CARTER, OF BROOKLYN, NEW YORK.

REVOLVING DOOR.

1,202,801.

Specification of Letters Patent.

Patented Oct. 31, 1916.

Application filed March 10, 1915. Serial No. 13,339.

To all whom it may concern:

Be it known that I, JOHN L. CARTER, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Revolving Doors, of which the following is a specification.

The invention relates to improvements in revolving or storm-doors, and one of the main purposes of the invention is to provide a door of this character which shall be jam proof, so that in case of panic or the like a clear passageway will be automatically formed by the pressure of persons attempting to squeeze through the doorway at opposite sides thereof.

In carrying out my invention I make use of the customary arc side-walls and a rotary structure comprising a suitable turntable and a plurality, preferably four, wings carried thereby, these wings being hinged near their vertical outer edges and adapted at their other or free vertical edges to meet at the pivotal center of the structure, thereby forming the usual compartments which persons enter and by pressure turn the revolving structure to permit them to pass through the doorway. The wings have an abutting and interlocking relation at the pivotal center of the door, and when pressed against by persons moving through the right hand portion of the passageway, as usual, said wings will remain in their interlocked abutting relation and all be carried around together; but in the event of panic or even at any other time, should persons attempt to force their way through the doorway by pressure on the left hand wings, said wings will open outwardly and thereafter, if anyone should attempt to press on the right hand wing, all of the wings will finally fold outwardly, in the manner hereinafter explained, and a clear passageway between the arc-walls will be formed, there being in accordance with my invention nothing at that time at the center of the passageway.

I am aware that it is usual to hinge the wings of revolving doors at the pivotal center of the structure, but in these constructions the wings when folded in line with the passageway between the arc sides, create an obstruction which is undesirable. In accordance with my invention I hinge the wings near their outer vertical edges and so arrange the parts that the wings may

fold outwardly toward the arc-walls and leave the passageway substantially unobstructed.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Figure 1 is a side elevation, partly in vertical section, of a storm-door and its walls and superstructure embodying my invention; Fig. 2 is a detail section through a small portion of one of the wings and turntable and is presented to illustrate a yieldable lock or catch for lending a certain amount of rigidity to the wings, even though such wings might be pushed at the left instead of the right of the passageway; Fig. 3 is a section through the same on the dotted line 3—3 of Fig. 2 and on a larger scale; Fig. 4 is a horizontal section on the dotted line 4—4 of Fig. 1 and by dotted lines illustrates the position the wings will take when through panic or other cause they are forced to fold outwardly toward the arc-walls; Fig. 5 is a horizontal section, partly broken away, taken on the dotted line 5—5 of Fig. 1; Fig. 6 is a horizontal section, taken about on the dotted line 6—6 of Fig. 1, the section being just below the turn-table by which the wings are suspended; Fig. 7 is an enlarged view, partly in section and partly broken away, of a frame which normally rotates with the turn-table and wings but which is adapted to have an independent reverse rotary movement to a limited extent when pressed against by one of the wings subjected to pressure on the wrong side thereof; Fig. 8 is a central vertical section through the upper central portion of the structure and taken on the dotted line 8—8 of Fig. 7; Fig. 9 is a vertical section through a small portion of the structure and is meant to show in side elevation the spring arm which is illustrated in top view in Fig. 6, and Fig. 10 is a horizontal section showing the several wings of the door in their normal position by dotted lines and in their outwardly folded or partly outwardly folded positions by solid lines.

In the drawings, 15 designates the arc side frames, 16 a hollow superstructure above and connecting said side frames and covering over the passageway between them, 17 a turn-table mounted within said superstructure, 18 a circular track or tramway for rollers 19 connected with said turn-table.

ble and by means of which said turn-table is suspended from and within the outline of said tramway, 20 equally spaced apart vertical bars or frames rigidly connected by brackets 21 with the said turn-table near the edges thereof, and 22 wings hinged at their outer vertical edges to the inner vertical edges of the bars or frames 20 and adapted when in their normal position to stand on radial lines extending toward the pivotal center of the door structure and at their inner edge portions to lap one upon another in series and enter into the abutting interlocking relation illustrated more particularly by solid lines in Fig. 4, in which it may be seen that the inner side edge of the lower wing laps against the outer edge of the right hand wing, that the side edge of said right hand wing laps against the outer edge of the upper wing, that the side outer edge of the upper wing laps against the outer edge of the left hand wing, and that the side edge of the left hand wing laps against the outer edge of the lower wing.

When the wings 22 are in the relation shown by full lines in Fig. 4 said wings will maintain such relation so long as persons passing through the doorway move to the right and press against the face of the wing ahead. The wings 22 are each formed on one face, that being the face against which pressure is to be applied by persons entering and leaving the passageway, with a handle bar 23. The outer edges of the bars or frames 20 are provided with strips of rubber, leather or the like 24 to engage the inner faces of the arc frames 15 during the rotary motion of the door and when the door is at rest, thereby to exclude drafts.

One of the more important features of my invention resides in the hinging of the wings 22 at their outer vertical edges to the inner vertical edges of the bars or frames 20 rigidly connected with the turn-table so that said wings while at their inner edges normally being in abutting interlocking relation may, under proper circumstances, fold outwardly toward the arc frames 15 for the purpose of leaving a clear passageway between said frames, said wings when folded outwardly toward the arc frames 15 taking the position indicated by dotted lines in Fig. 4.

The turn-table 17 is of substantial character and has secured upon it the brackets 25 carrying the rollers 19, the latter projecting over and resting upon the track or tramway 18 and thereby suspending the bars or frames 20 and wings 22. The turn-table 17 is provided with spring studs 26 of not unusual character adapted to engage recesses 27 in the upper edges of the wings 22, these studs being provided to releasably hold the wings in their normal operative position shown by full lines in Fig. 4 but to

release said wings under any undue pressure against the wrong face thereof. The turn-table 17 is recessed at the lower side of its central portion, as at 29 (Fig. 8), and thereat is provided a rotary frame 30 which is suspended from the turn-table and has a pivot or axle 31 extending through said turn-table, the pivot 31 having on its upper end a nut 32 and below said nut a friction washer 33, the purpose of which is to afford some resistance to the independent rotary movement of the frame 30. The frame 30 rotates with the turn-table 17 under normal conditions, but in the event of a panic or misuse of the wings said frame 30 is adapted to have a limited rotary movement independently of the turn-table. The frame 30 has four downwardly extending arms 34 or one arm for each of the wings 22. It may be seen on reference to Figs. 7 and 8 that the wings 22 are in close relation to and lap upon the faces of the respective arms 34. In the normal operation of the wings 22 said wings remain in the relation to the frame 30 shown in Figs. 5, 7 and 8, said wings, frame and turn-table 17 then all turning or rotating together and said wings at such time not exerting any pressure against the frame 30. The frame 30 has pivotally secured to it a link 35 which extends outwardly and is connected at its outer end to a pivoted link 36 connected with a cam 37, the normal position of which is shown in Fig. 5 by dotted lines and the operated position of which is shown by solid lines in Fig. 6. The links 35, 36 and cam 37 remain in their normal inoperative position shown in Fig. 5 during the normal condition and operation of the wings 22, but in the event of pressure on the reverse side of a wing, as by a person attempting to go through on the left side of the passageway, the wing will fold outwardly toward the adjacent side frame 15 and in doing so the upper inner edge of the wing will, by pressing against one of the arms 34, cause the frame 30 to make a limited rotary movement with the result that said frame during such movement will draw on the link 35 and through said link cause the link 36 to turn on its pivot and carry the cam 37 outwardly against the inner face of the adjacent arc frame 15 or to the position shown in Fig. 6.

If we assume that due to panic or otherwise persons are endeavoring to move through the passageway in the direction of the two arrows shown in Fig. 6 and that one person has pressed against and moved the left hand wing 22 to the position shown in Fig. 6 and thereby operated the frame 30, links 35, 36 and cam 37, and that some other person is pressing on the proper side of the first right hand wing 22, it will be seen that the left hand wing having opened, the pressure to turn the entire frame in the re-

verse direction is released and the pressure on the proper side of the right hand wing will result in the entire set of wings being carried around until the cam 37 strikes the stud 38 and arrests the entire structure. At this time the person who pressed against the wrong side of the left hand wing will be in a position to press against the wrong side of the next forward wing and cause it to fold outwardly or to the position shown by dotted lines in Fig. 4, and further the rotary movement of the structure caused by the proper pressure on the right hand wing until the entire structure became arrested by the engagement of the cam 37 with the stud 38, resulted in an arm 40 connected with the forward right hand wing being carried against a spring dog 41 and in said spring dog by its flexion against said arm 40 turning said forward right hand wing 22 to an open position, its free edge being thereby carried from the adjacent edge of the first right hand wing against which the person passing along that side of the passageway exerted his pressure. The turning outwardly of the forward right hand wing by the action of the spring dog 41 leaves the inner right hand wing entirely free to fold outwardly, under the pressure of the person passing at the right, to the position shown by dotted lines in Fig. 4, and all of the wings having been turned outwardly a clear passageway is formed between the side frames 15. Each wing 22 is provided with one of the crank or lever-arms 40 and each arm is connected with the wing by a vertical pin 42.

In the normal position and proper operation of the wings 22, the crank-arms 40 ride against the spring dog 41 and the latter yields inwardly to permit the passage of said arms 40, said arms and dog during such period not performing any function, but when at any time the then left hand wings have been folded outwardly, thereby releasing the then forward right hand wing, the pressure of the dog 41 against the crank arm 40 of said wing acts to turn said wing outwardly, and that releases the inner right hand wing to turn or be folded outwardly, the outward folding of the forward right hand wing taking place, under the action of the spring dog 41, during that limited movement of the rotary structure necessary for the cam 37 to engage the stud 38 and the outward folding of the inner right hand wing taking place immediately thereafter and caused by the pressure against the same of the person attempting to go through the passageway at the right hand side thereof.

In Fig. 10 I illustrate an intermediate stage in the operation of the wings when, due to panic or otherwise, said wings become operated in an abnormal manner. In Fig. 10 the rotary portion of the door is

shown as having turned from the position illustrated in Fig. 6 to that in which the cam 37 has moved to engagement with the pin or stud 38 and thereby arrested the entire rotary portion of the structure. This stage having been reached the forward left hand wing starts outwardly by the pressure applied against it and releases the forward right hand wing which is started on its outward movement by the spring dog 41 and said wing having started outwardly the first right hand wing becomes released and it will, by the pressure exerted against it, fold outwardly.

In Fig. 4 I show by dotted lines all of the wings as having been completely folded outwardly whereas in Fig. 10 I illustrate that intermediate stage of the operation at which the wings are in action and moving to the respective positions in which they are illustrated by dotted lines in Fig. 4.

I provide a stud 38 at each end of each side frame 15, as shown in Fig. 6, so that in whatever position the four wings of the door may be when wrongly operated, the cam 37 will after a limited interval, arrest the rotary portion of the structure so that all of the wings may be turned outwardly to the position illustrated by dotted lines in Fig. 4.

What I claim as my invention and desire to secure by Letters-Patent, is:

1. A revolving or storm door comprising side walls and a rotary structure including an overhead turn-table, bars dependent therefrom and radial wings hinged at their outer vertical edges to said bars and at their vertical free edges meeting at the pivotal center of the structure and being lapped one upon another in series, each wing engaging with its side the edge face of one adjacent wing and being engaged on its edge face by the side of the other adjacent wing, combined with means for arresting the rotary structure turning in the proper direction after a left hand wing has been opened outwardly by pressure applied to its reverse face, and means for forcing a forward right hand wing to its open position just prior to said structure becoming arrested.

2. A revolving or storm door comprising side walls and a rotary structure including an overhead turn-table, bars dependent therefrom and radial wings hinged at their outer vertical edges to said bars and at their vertical free edges meeting at the pivotal center of the structure and being lapped one upon another in series, each wing engaging with its side the edge face of one adjacent wing and being engaged on its edge face by the side of the other adjacent wing, combined with means for arresting the rotary structure turning in the proper direction after a left hand wing has been opened outwardly by pressure applied to its reverse

face, and means for forcing a forward right hand wing to its open position just prior to said structure becoming arrested, said means for arresting the rotary structure 5 comprising a rotary frame to be turned by any wing opened by pressure applied to its reverse face, a fixed stud and a part movable by said rotary frame in the plane of said stud and to engage the same for arresting 10 said structure, and said means for forcing the forward right hand wing to its open position being an arm on each wing and a spring dog against which said arms successively move and which when a wing is otherwise unrestrained will act against its arm to 15 turn the wing outwardly.

Signed at New York, in the county of New York and State of New York, this 9th day of March, A. D. 1915.

JOHN L. CARTER.

Witnesses:

ARTHUR MARION,
CHAS. C. GILL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."