(No Model.) 3 Sheets—Sheet 1.

T. VAN KANNEL.

STORM DOOR STRUCTURE.

No. 588,888. Patented Aug. 24, 1897.

Fig. 1.

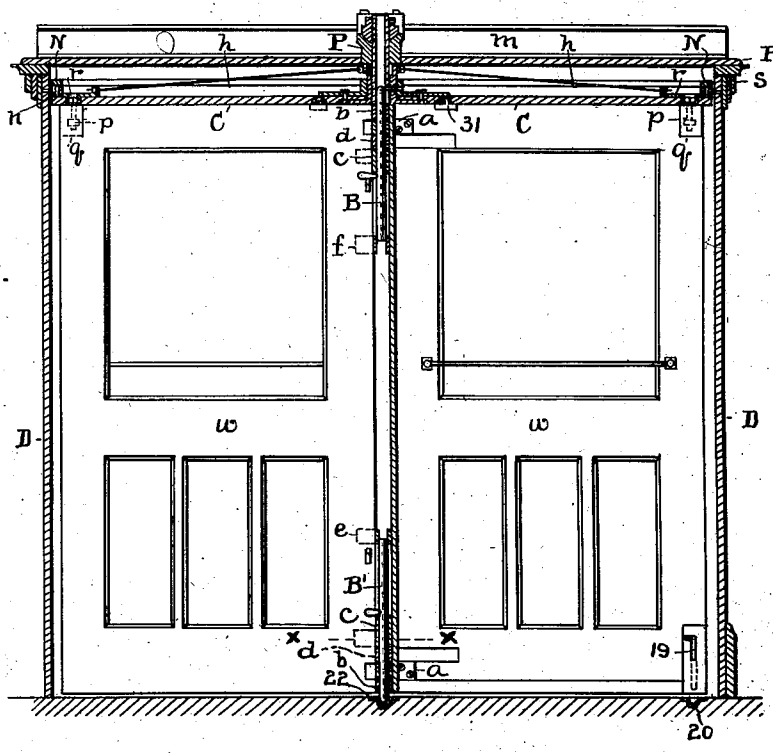
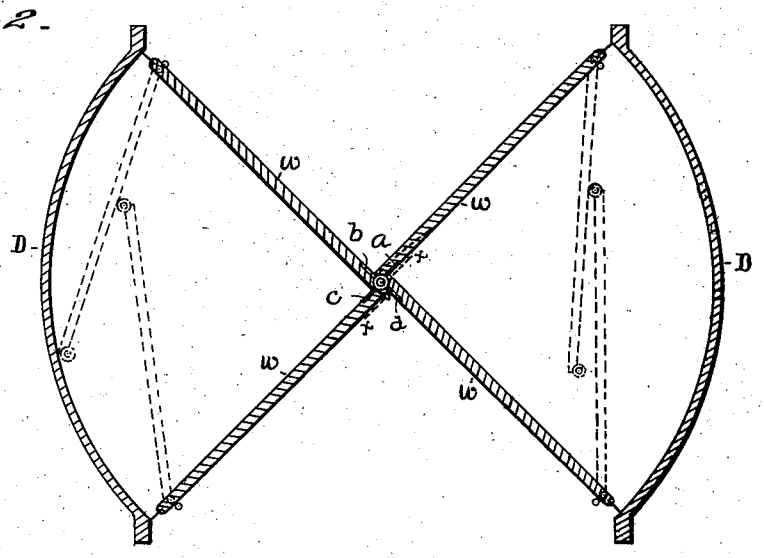


Fig. 2.



Witnesses
Norris A. Clark.
Walter D. Peck.

Inventor
Theophilus Van Kannel
By his Attorney Wm. B. Vanneman

(No Model.) 3 Sheets—Sheet 2.

T. VAN KANNEL.

STORM DOOR STRUCTURE.

No. 588,888. Patented Aug. 24, 1897.

Fig. 1.

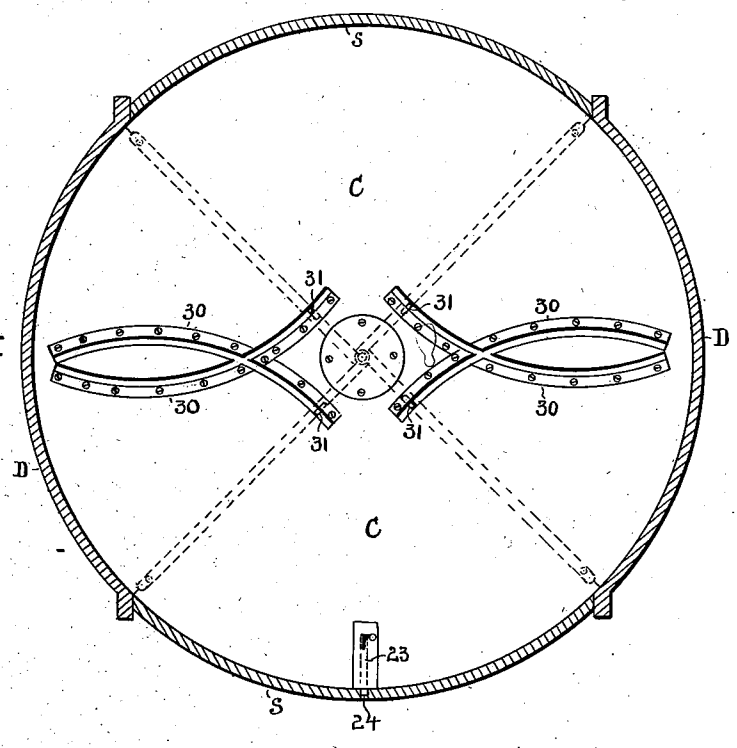
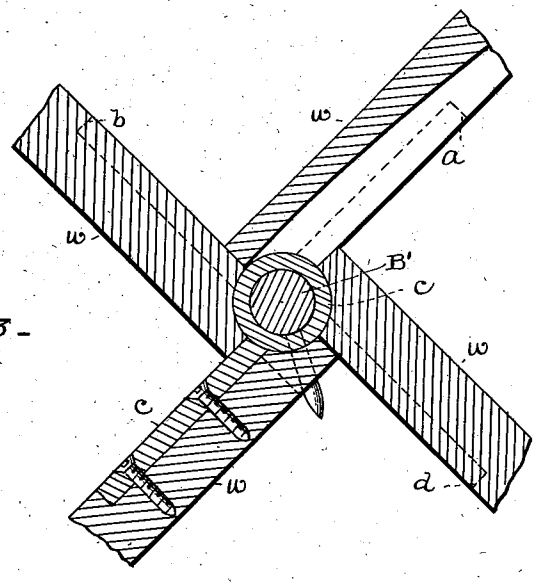


Fig. 3.



Witnesses
Norris A. Clark.
Walter D. Peace.

Inventor
Theophilus Van Kannel
By his Attorney Wm. B. Vanzie

(No Model.) 3 Sheets—Sheet 3.

T. VAN KANNEL.

STORM DOOR STRUCTURE.

No. 588,888. Patented Aug. 24, 1897.

Fig. 5.

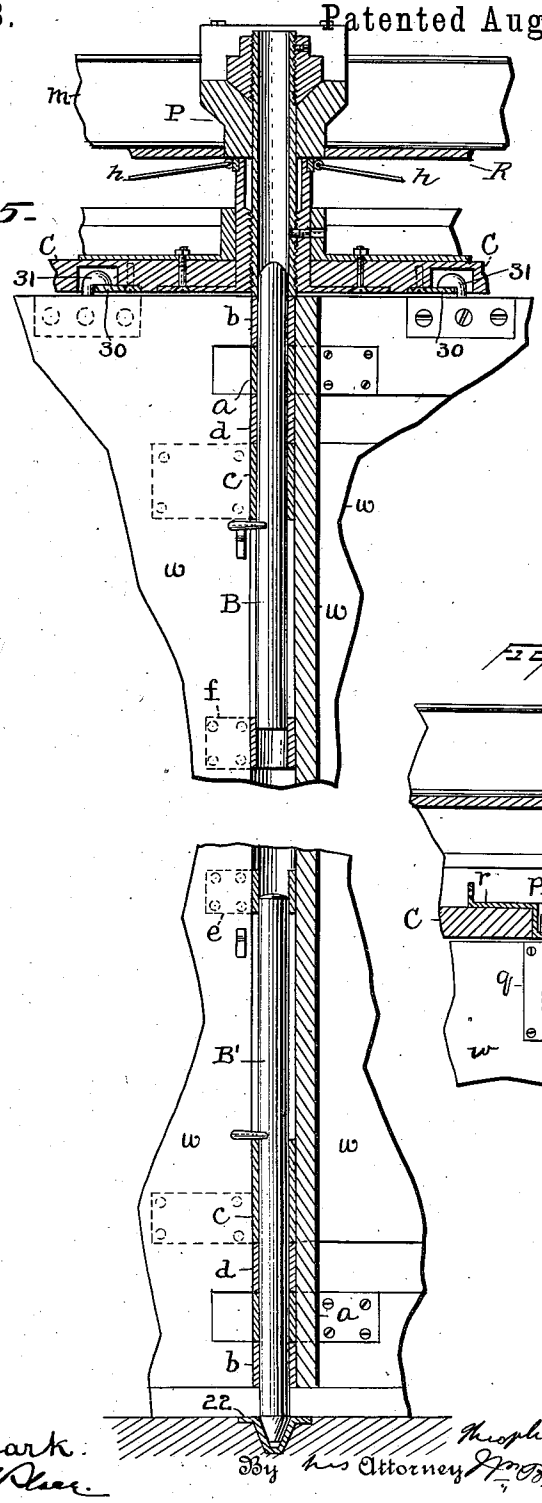
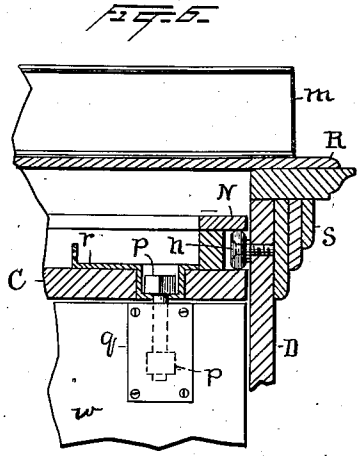


Fig. 6.



Witnesses
Norris A. Clark.
Walter D. Shaw.

Inventor
Theophilus Van Kannel
By his Attorney

UNITED STATES PATENT OFFICE.

THEOPHILUS VAN KANNEL, OF NEW YORK, N. Y., ASSIGNOR TO THE VAN KANNEL REVOLVING DOOR COMPANY, OF SAME PLACE.

STORM-DOOR STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 588,888, dated August 24, 1897.

Application filed May 3, 1897. Serial No. 634,835. (No model.)

To all whom it may concern:

Be it known that I, THEOPHILUS VAN KANNEL, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Storm-Door Structures, of which the following is a specification.

My invention is an improvement in rotating doors designed to prevent drafts of air and changes in temperature in office-buildings, hotels, and halls during frequent entrance and exit.

The object of my improvement is to provide a more satisfactory means for supporting the structure and for folding the wings to free the passage-way and enlarge the entrance.

I provide a doorway having opposite sides in the form of an arc or segment of a circle or polygon. The door is preferably composed of a series of radial wings united at a central line, so that they may be easily separated. I also provide a rotating elevated pivot or turn-table and support from it a ceiling extending over the radial wings. This ceiling is preferably coextensive with the circle described by a rotating wing. I connect the outer upper edge of each wing by means of a pivot-like connection to a point in this ceiling, and a corresponding point in the lower edge of each wing I connect to a corresponding point in the floor. These two points of connection for each wing permit of separating the wings at a central line and folding them outwardly, turning them on the described pivot-like connections at or near their outer edges, so that they may be lapped and folded against the doorways and the passage left completely free. I provide tracks supported from the ceiling, there being one such track for each wing. A hook or suitable mechanical device is fixed to the upper edge of each wing, and this engages with the track, whereby the wing is movably supported when the doors are disconnected at the central line, and the operation of folding them is proceeded with. When the doors are to be folded, the rotating ceiling is first locked in position by means of a bolt and a socket, the latter being in a stationary portion of the structure in a predetermined relative position with respect to the sockets in the floor, which receive the bolts in the lower outer edge of each wing. By this arrangement the locking of the ceiling leaves the wings in position to be locked to the floor. For the purpose of supporting the rotating ceiling I connect the rotating turn-table and circumferential points in the ceiling with each other by means of rods or braces, and for the purpose of steadying the rotating ceiling I provide a fixed circumferential rail upon the upper surface of the ceiling, with soft-surfaced rollers located upon fixed portions of the structure in position to engage with the described rail.

The accompanying drawings illustrate my invention.

Figure 1 is an elevation partly on a central section. Fig. 2 is a cross-section on the line x x, Fig. 1. Fig. 3 is a detail view showing the means for uniting the wings at the central line. Fig. 4 shows the under side of the rotating ceiling with the arc-shaped rails for supporting the wings. Fig. 5 is an enlarged view of the rotating support, ceiling, and means for uniting the wings on the central line. Fig. 6 is a detail showing the peripheral rail and rollers for steadying the ceiling and also the pivot connection between the exterior upper edge of a wing and the ceiling.

D is the doorway.

w are the wings of the rotating door. I have shown four wings w. These are united at a central line by means of pairs of tubular sections or ring-sections, each section having a flange which is screwed to its wing. I have shown eight of these sections arranged in two groups. One pair of sections are attached at at or near opposite extremities of each wing. The sections of each group are designated by the letters a, b, c, and d. The group of sections a b c d at the upper extremity of the wings are connected together by means of the vertically-reciprocating bolt B, which also enters the supporting-pivot P and serves to unite the sections together and to the support. The group of sections a, b, c, and d at the lower extremity are united by the vertically-reciprocating bolt B', which also enters a

socket 22 in the floor and serves to hold the lower portion of the door against displacement. There are two additional sections *e* and *f*, as shown in Fig. 1, for the purpose of holding or retaining the bolts B and B' when in their withdrawn position.

The pivot or turn-table P is supported upon a roof R, and the support is made rigid and of sufficient strength by the use of one or more girders of merchant iron, as *m*.

C is the rotating ceiling, preferably circular and supported on the pivot P. Braces *h* extend from the pivot P to peripheral points of the ceiling C and serve to impart rigidity. At the outer upper extremity of each wing *w* there is a metal casting *q* fixed in position, and at a corresponding point in the ceiling C there is a bearing *r* of metal. The pieces *q* and *r* are united by a pivot *p*, which is loose and permits the free rotation of the wing *w*, suspended therefrom. At the lower outer extremity of each wing *w* there is a bolt 19, engaging a socket 20 in the floor. In the ceiling C there is a bolt 23, engaging a socket 24 in a stationary part of the structure, such as the depending cornice *s*. The position of the socket 24 is such, with respect to the sockets 20 in the floor, that when the bolt 23 has been placed in its socket 24 each of the bolts 19 on each of the wings *w* will be in position to engage with the corresponding socket 20.

Referring to Fig. 4, where the under side of the ceiling is shown, there are a series of rails 30, arc-shaped in outline, there being one rail 30 for each wing. These rails are fixed to the under side of the ceiling C. On the upper end of each wing *w* there is a hook 31, having a smooth flat surface riding on the rail 30. This is clearly shown in Fig. 5, and the object of the construction is to afford support to the wing *w* when it is freed at the central line by the withdrawal of the bolts B and B'. When the wings are so freed, they may be folded or lapped into the position shown in dotted lines in Fig. 2, where they are out of the way in case it is desired to move a bulky structure or goods of any description in or out, or to provide for free ventilation.

For the purpose of steadying the rotating ceiling I provide a peripheral wooden rail N, which follows the circumference of the ceiling and is fixed to the upper side thereof, and I fix a series of rollers *n*, which are preferably composed in part of rubber applied in a manner designed to deaden the sound of rotation. These rollers *n* are fixed to the interior of the depending cornice *s* and engage the rail N, substantially as shown.

What I claim, and desire to secure by Letters Patent, is—

1. In a storm-door structure the combination of a series of radial wings united at a central line, a suitable doorway therefor, a ceiling connected to said wings, and means for rotatably supporting said ceiling, substantially as described.

2. In a storm-door structure the combination of a rotating door composed of a series of radial wings united at a central line, an arc-shaped doorway therefor, a rotating ceiling separably connected to said wings, and means for supporting said ceiling, substantially as described.

3. In a storm-door structure the combination of a rotating door composed of a series of radial wings with means for uniting them at a central line, an arc-shaped doorway therefor, a rotatably-supported ceiling, and pivot connections between said ceiling and two or more of the wings, substantially as described.

4. In a storm-door structure the combination of a rotating door composed of a series of radial wings separably united at a central line, a suitable doorway therefor, a ceiling covering the door structure, and a pivot connection between the upper exterior portion of each wing and said ceiling, substantially as described.

5. In a storm-door structure the combination of a series of radial wings separably united at a central line, a suitable doorway therefor, a ceiling extending over said wings, and a pivot connection between each wing and points in the ceiling and in the floor at or near the outer edge of said wings, substantially as described.

6. In a storm-door structure the combination of a series of radial wings separably united at a central line, a suitable doorway therefor, a ceiling extending over the radial wings, a pivot connection between the ceiling and each of said wings, and a separable pivot connection between a corresponding point in the lower part of each wing and a point in the floor, substantially as described.

7. In a storm-door structure the combination with a suitable doorway of a series of radial wings, an elevated rotating support for said wings and means for uniting said wings at a central line consisting of a series of ring-shaped or tubular sections fixed in pairs at opposite extremities of each wing, each section being in a different horizontal plane, a bolt for uniting the sections at one extremity of the wings with each other and with the rotating support, and a bolt for uniting the sections at the other extremity of the wings with each other and with a point in the floor, substantially as described.

8. In a storm-door structure the combination with a suitable doorway of a series of radial wings, an elevated rotating support for said wings, means for uniting said wings at a central line consisting of a series of ring-shaped or tubular sections fixed in pairs at opposite extremities of each wing, each section being in a different horizontal plane, a ceiling extending over said wings and fixed to said rotating support, a bolt for uniting the sections at one extremity of the wings with each other and with the rotating support, a bolt for uniting the sections at the other extremity of the wings with each other and with a point in the floor, a pivotal connection be-

tween the upper edge of each wing and the rotating ceiling, and a bolt for connecting a corresponding point in the lower edge of each wing with a point in the floor, substantially as described.

9. In a storm-door structure the combination of a series of radial wings united at a central line, a suitable doorway therefor, a ceiling connected to said wings, means for rotatably supporting said ceiling, and a bolt for locking said ceiling against rotation at a predetermined point, substantially as described.

10. In a storm-door structure the combination of a series of radial wings united at a central line, suitable doorways therefor, a ceiling connected to said wings, means for rotatably supporting said ceiling, a bolt for each wing registering with sockets in the floor, a bolt fixed to the rotating ceiling, and a socket therefor in a stationary part of the structure so located with respect to the sockets in the floor that when the ceiling-bolt is in its socket the floor-bolts will register with corresponding sockets, substantially as described.

11. In a storm-door structure the combination with a suitable doorway of a rotating door composed of a series of radial wings united at a central line, a ceiling extending over said wings, a central rotating support for said ceiling and wings, and brace-rods extending from said rotating support to points at or near the periphery of the rotating ceiling, substantially as described.

12. In a storm-door structure the combination with a suitable doorway of a door composed of a series of radial wings united at a central line, a rotating ceiling extending over the rotating door structure, a peripheral rail fixed to said ceiling, and a series of rollers fixed to stationary points in position to engage the peripheral rail and support the ceiling, substantially as described.

13. In a storm-door structure the combination of a series of radial wings, separably united at a central line, suitable doorways therefor, a ceiling extending over said wings, means for rotatably supporting said ceiling and wings, a pivotal connection between said ceiling and a point in the upper exterior edge of each door, an arc-shaped track or groove fixed to the ceiling for each wing, and a traveling connection between the upper edge of each wing and the corresponding groove or rail, substantially as described.

Signed at New York, in the county of New York and State of New York, this 30th day of April, A. D. 1897.

THEOPHILUS VAN KANNEL.

Witnesses:
FRANCES A. SPERRY,
WALTER S. PLACE.