No. 847,443. PATENTED MAR. 19, 1907.

N. P. SJÖBRING.

SHEET METAL DOOR.

APPLICATION FILED DEC. 14, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

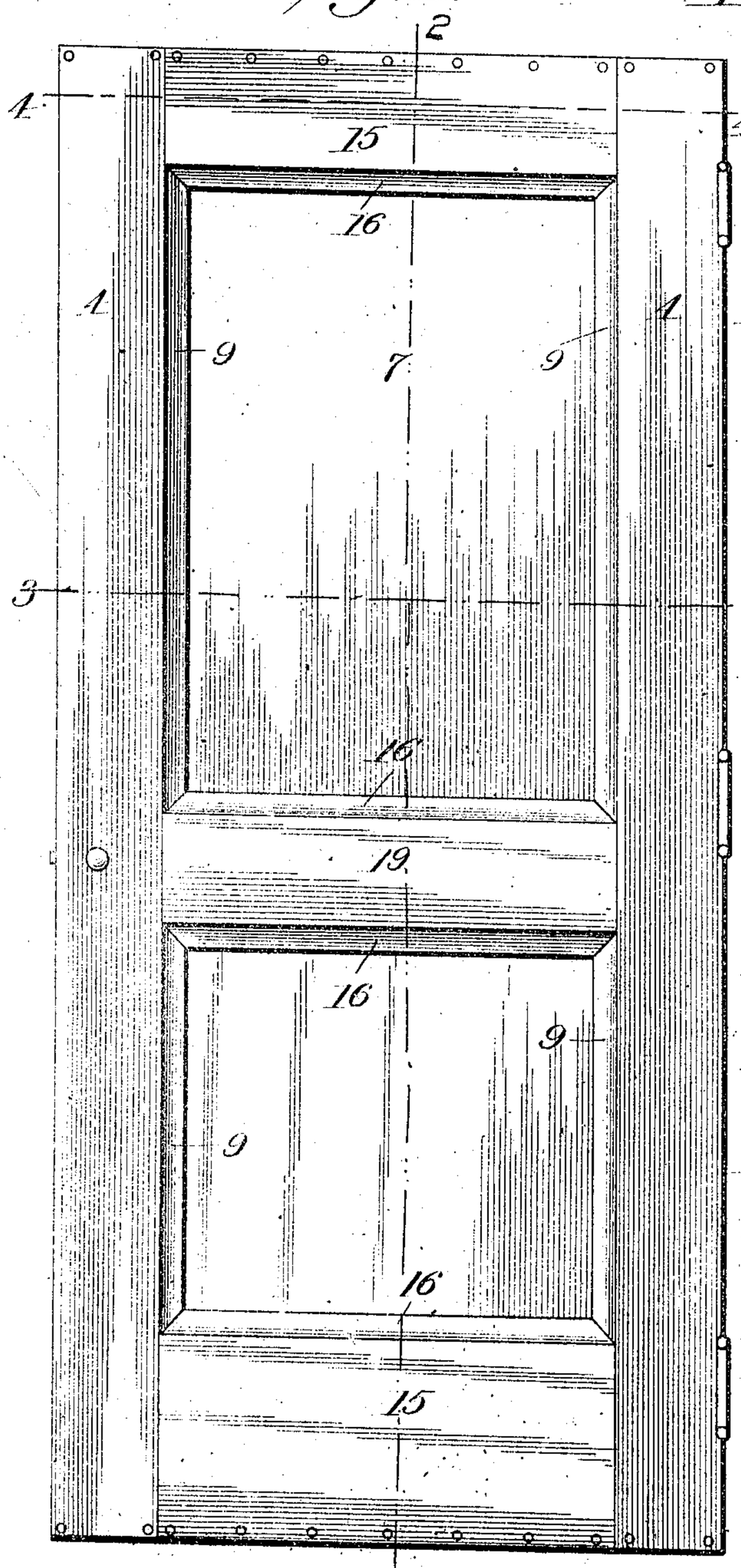


Fig. 2.

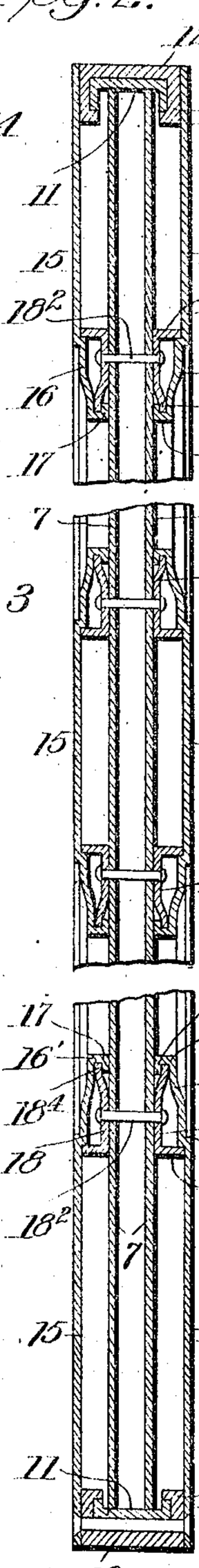
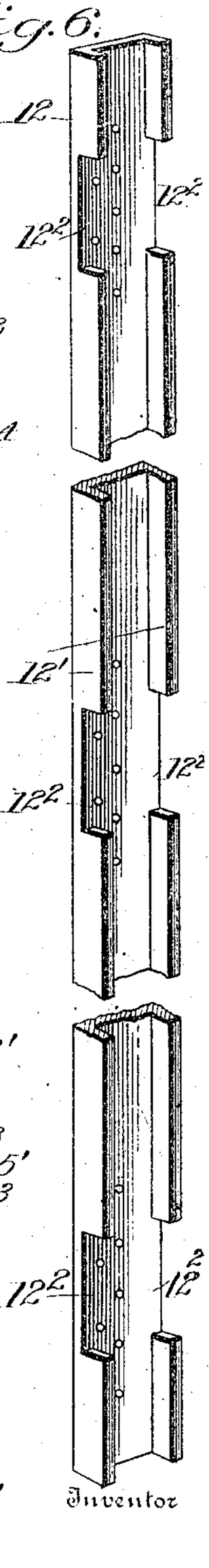


Fig. 6.



Witnesses

C. H. Walker.

C. F. Fowler.

Nils P. Sjöbring

By F. Waller Fowler

his Attorney

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SHEET METAL DOOR.

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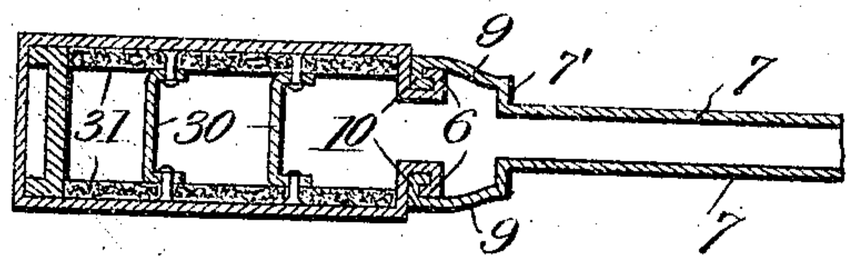
2 SHEETS—SHEET 2.

Fig. 3.



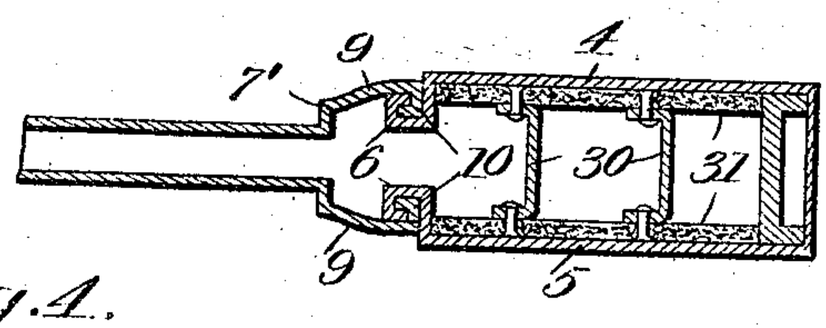
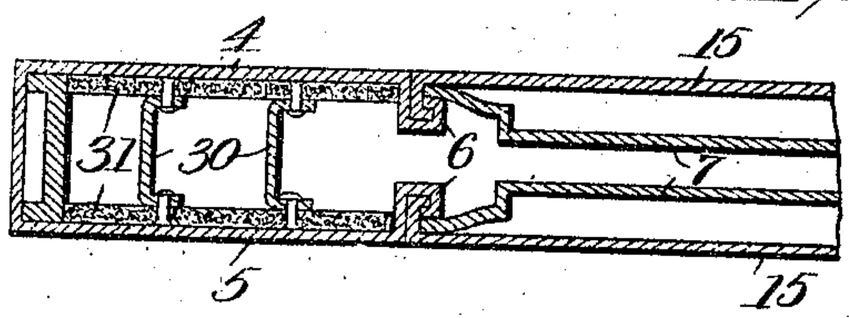


Fig. 4.



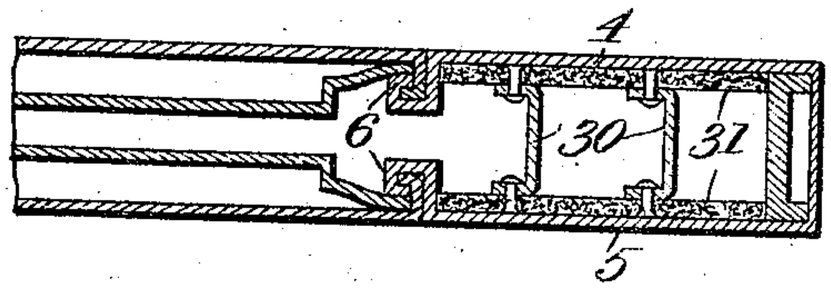


Fig. 5.

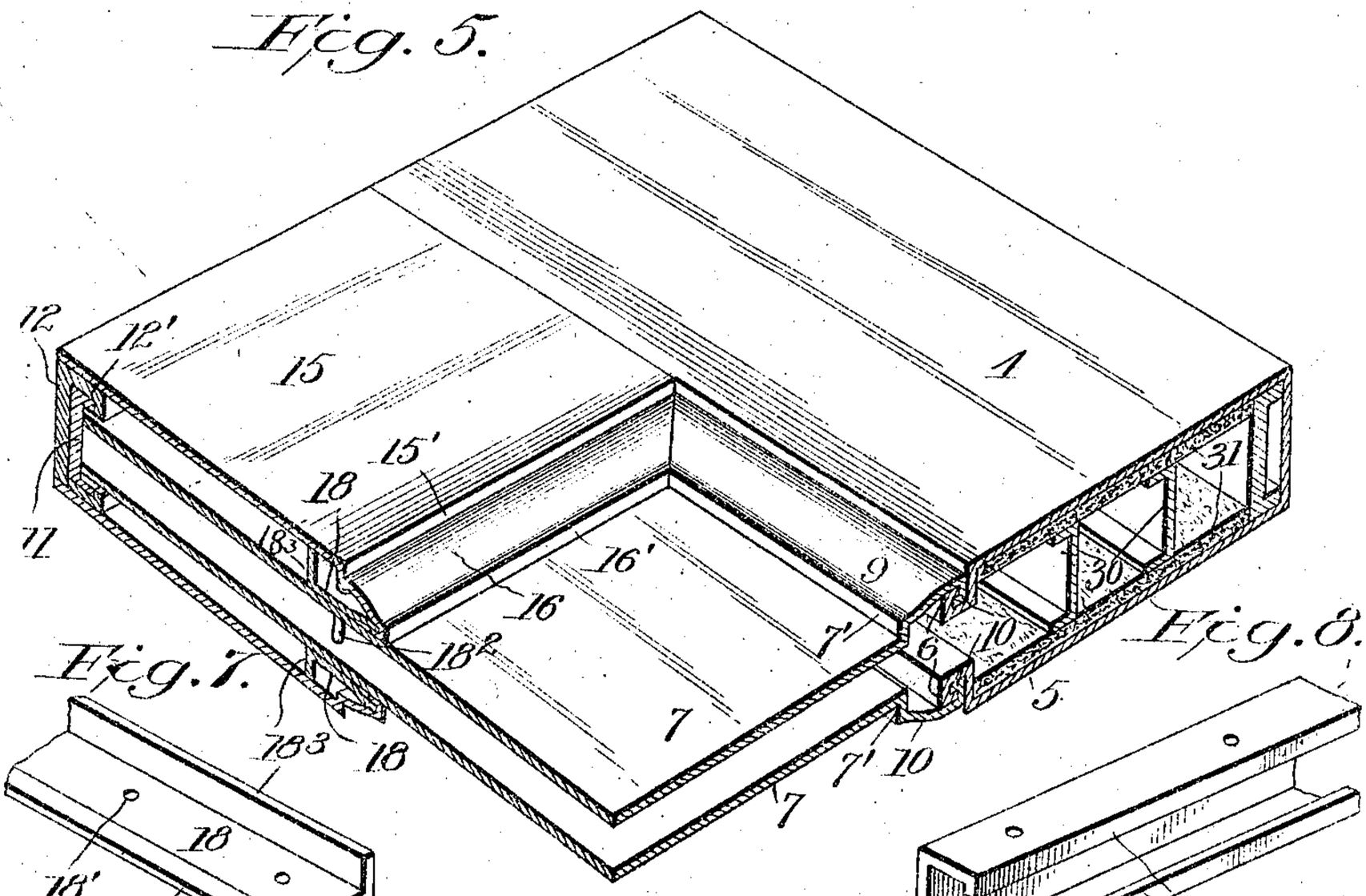


Fig. 7.

Fig. 8.

Fig. 9.

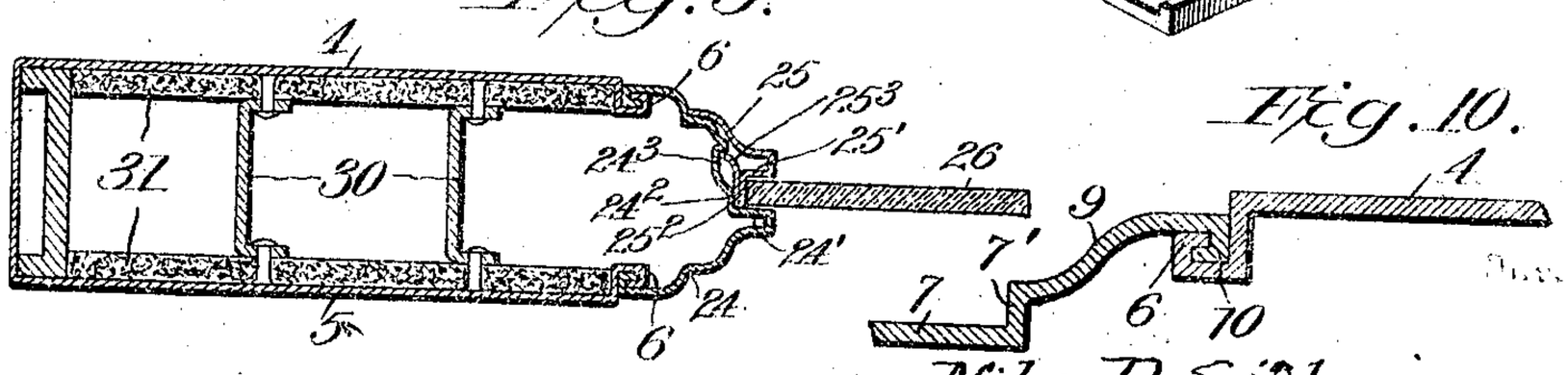


Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

NILS P. SJÔBRING, OF JAMESTOWN, NEW YORK.

SHEET-METAL DOOR.

No. 847,443. Specification of Letters Patent. Patented March 19, 1907.

Application filed December 14, 1906. Serial No 347,845.

To all whom it may concern.

Be it known that I, NILS P. SJÔBRING, a citizen of the United States, residing at Jamestown, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Sheet-Metal Doors, of which the following is a specification.

This invention relates to doors, and particularly to doors constructed of sheet metal or sheet metal with an inner lining of non-conducting and non-combustible material and also to doors constructed of sheet metal, but wherein a glass panel may be substituted for a panel of sheet metal.

The essential objects of the present construction are to construct the door with a channel-iron or keeper on each side, the said irons or keepers along the vertical stiles of the door having their flanges cut away at points to facilitate the attachment of the door hinges and lock; also, the stiffening or strengthening of the end sections of the door by the insertion between panel-sections and the plates which constitute said sections of angle-iron plates or channel members having flat surfaces bolted or riveted to the panel-sections and having one edge bent at right angles and adapted to bear under the inner surfaces of the end sections to brace and reinforce the same from the inside, said angle-iron plates having their opposite edges slightly bent outwardly to form tongues which engage locking-flanges formed on the inturned inner edges of the molding which is formed along the inner edges of the end sections.

A further object of the present invention is to provide means for internally bracing the vertical stiles of the door, said bracing means serving also to retain in place along the inner sides of said stiles sheets of asbestos or other non-conducting and indestructible material; and a still further object is the provision of means whereby a glass panel may be substituted for the metal-panel sections, and a separate, and supplemental molding-section may be employed for retaining the glass panel in place, said supplemental molding-section having an elastic or spring latch or tongue adapted to engage a groove or catch formed in the side molding-pieces, whose outer edges interlock with the plates which constitute the vertical stiles.

With these and other objects in view my invention consists of the parts and the constructions, arrangements, and combinations of parts, which I will hereinafter describe and claim.

In the accompanying drawings, forming part of this specification, and in which similar reference characters indicate like parts in the several views, Figure 1 is a side elevation of a door embodying my invention. Fig. 2 is a vertical sectional view of the same on the line 2 2 of Fig. 1. Fig. 3 is a cross-sectional view on the line 3 3 of Fig. 1. Fig. 4 is a cross-sectional view on the line 4 4 of Fig. 1. Fig. 5 is a broken perspective view showing one corner of the door. Fig. 6 represents in perspective one of the keepers or channel-irons 12 removed. Fig. 7 is a perspective view of a part of one of the angular bracing-plates 18. Fig. 8 is a detail of one of the keepers 12. Fig. 9 is a cross-sectional view of a door wherein a glass panel is substituted for the metal panel. Fig. 10 is an enlarged sectional detail of the seam between the side stile and panels.

The design of door shown is well known, in that it is similarly paneled on opposite sides, though the side sections or stiles are integrally formed to present in one body both sides of the door. This, however, is well-known in the art and does not materially differ from my former patent, No. 809,145, dated January 2, 1906. The stiles are substantially identical in construction, and a specific description of one will be sufficient for both. Each of said stiles is formed of a single strip of metal of appropriate shape in cross-section and having a length equal to the desired height of the door. As thus constructed the stiles comprise the parallel plates or strips 4 and 5, spaced apart a distance about equal to the desired thickness of the door from front to rear, the inner edges of these plates or strips being inturned and fashioned with appropriate locking-flanges 6.

When constructing the door with a metal panel, as in Figs. 2, 3, and 4, the panel-sections 7 and 7, one representing each side of the door, are spaced apart a suitable distance, and each comprises an elongated metal sheet or strip which near one edge is projected or offset, as at 7′, and then inclined upwardly and outwardly in either a regular or irregular curve, as at 9, to form a molding portion interior to the inner edge of the side stiles, the free edge of this molding portion being bent inwardly at right angles to form a wall 10 and thence again bent at right an-

gles and interlocking with the aforesaid locking-flange 6, formed along the inner edge of the stile-section, the construction being very similar to that shown and described in my former patents, No. 809,145, dated January 2, 1906, and No. 835,478, dated November 6, 1906, with either of which patented doors the present improvements are adapted to be applied.

The upper and lower end sections of the door are identical in construction, each comprising duplicate plates 15, the outer edges of which are arranged to overlie and rest in engagement with the inturned flanges 12′, formed on the edges of the keeper 12, to which flanges the plates are bolted, riveted, or otherwise secured. The plates 15 are of a length suitable for the desired door to be constructed, and their inner portions are offset at 15′ to form a shoulder, and the remaining portion interior to this shoulder is formed in a curve or molding 16, which corresponds to the curve or molding 9, fashioned on the outer side edges of the panel-section, the free or inner edges of which molding 16 being bent or fashioned to form a locking-flange 16′, the terminal edge of which is parallel with and lies closely against the panel-section. The curves or moldings 9 and 16 form a relief contour between the outer edges of the panel and the adjacent inner portions of the stile-sections.

In order that the plates 15, which comprise the end sections of the door, may be maintained in their proper spaced relation and to reinforce or brace these plates against pressure from without or inward warping, I locate interior to each plate the angle-iron strip 18. (Shown in Fig. 7.) These strips lie crosswise of each end of the door just under the lower or molding sections 16. Each strip extends the full length of an end section plate 15, and it has a series of holes 18′ made through its flat central portion adapted to receive bolts or rivets 18^2 or like fastening means, by which the angle-iron strip may be secured firmly to the panel-sections 7.

The outer longitudinal edge of each of the strips 18 is bent at right angles to the flat central body portion of the strip to form an outstanding flange 18^3, whose length of projection is such that its free edge bears under directly in contact with the inner side of the adjacent plate 15 of the end section of the door, and thereby forms an abutment or stop to resist any inward movement of said plate. The opposite free edge of this angle-iron strip 18 is slightly bent outwardly, as at 18^4, to form a tongue which is designed to engage in the locking-flange 17, formed in the inner free edge of the molding-section of the plates 15 of the end sections of the door. Similar angle-iron strips, arranged as before described, are also employed for any transverse intermediate sections with which the door may be provided, such an arrangement being shown at 19 in Fig. 2.

Interior to each of the keepers 12 is a binder 11, these keepers and binders being constructed and arranged for the purpose set forth in my aforesaid prior patents, except that in the present case the keepers which extend along the side stiles of the doors have their flanges cut away at points, as at 12^2, to allow the usual hinges and the lock to pass through to the outside and to be appropriately secured.

Referring now to the cross-sectional views, Figs. 3, 4, and 9, it will be observed that within the hollow stiles between the plates 4 and 5 thereof I rivet or otherwise secure suitable channel-irons 30, whose flanges are arranged parallel with the plates 4 and 5 and bear against the inner surfaces of a lining 31, formed of sheets of asbestos or other non-conducting and indestructible material, whereby the door is rendered more certainly fireproof, this lining occupying the space between the locking-flanges of the stiles and the keepers at the outer edges of said stiles.

When it is desired to construct the aforesaid metal door with a glass panel, as shown at 26 in Fig. 9, I form the molding portions along the inner edges of the side stiles of separate pieces 24 and 25, the said piece 24 being given any desired curvature or formation in cross-section to form the moldings at both sides of the door and having its outer edges to interlock with the locking-flanges formed along the inner edge of the stile-section or plates 4 and 5. Near the vertical central plane of the piece 24 and the corresponding plane of the side stile the said piece 24 is bent to form a vertical inwardly-extending wall 24′, at the base of which the piece 24 is bent laterally to form a horizontal wall 24^2 and then again bent or fashioned to form a groove or channel 24^3 between the horizontal wall and the upper edge of the curved or molding portion at the opposite side of the door.

The vertical wall 24′ of the piece 24 forms one side of the channel or recess in which the edge of the glass panel 26 is fitted, the other walls of this channel being formed by the companion piece 25 of the molding-sections. This piece 25 consists of a strip, one edge portion of which is adapted to overlie the upper curved portion of the piece 24 on that side of the door, and it is given a curve corresponding to the inner portion of the piece 24 at the opposite side of the door, the said piece 25 being bent to form a vertical wall 25′, which is parallel with the corresponding wall 24′ of the piece 24 and is again bent at the base of said wall to form the horizontal wall 25^2 of the recess in which the edge of the glass panel is fitted, the inner side edge portion of the piece 25 being thence bent under the horizontal wall 25^2 and between it and

the horizontal wall 24^2 of the piece 24 and has its extremity turned to form a toe or flange 25^3, which is adapted to spring into locking engagement with the groove or channel 24^3 of the piece 24. The outer edge of the piece 25 may, if desired, be secured to the corresponding and matching portion of the piece 24 by soldering, brazing, riveting, or other well-known means.

It will thus be seen that for a glass panel door each stile is made of two pieces which fit together by an endwise movement of one member relative to the other, one member having a seat for the edge of the glass panel and forming also the molding-section of said stile, and a supplemental companion piece 25, which forms a part of the molding on the side of the door on which said piece is located and which may be fitted against and under the already-seated glass and has a member, as a spring-tongue, adapted to spring into locking engagement with the companion molding-section to securely hold the glass and form an attractive finish for the portion of the door surrounding the glass. The piece 25 may also be detached without much difficulty to remove the glass from the door.

It will be understood that each side stile has the molding formation above described and that a corresponding formation may be used about the inner edges of the end sections.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A door comprising stile-sections, cross-sections interlocking with the stile-sections and extending transversely of the door, panel-sections interlocking with the stile-sections, and angle-iron pieces lying parallel with the panel-sections and having outwardly-extending flanges bearing edgewise against the inner sides of the cross-sections whereby the cross-sections are braced against pressure from the exterior.

2. A door comprising stile-sections, end sections interlocking with the stile-sections and extending transversely of the door, said stile-sections and end sections being provided with an ornamental molding along their inner edges, panel-sections interlocking with the stile-sections, and angle-iron pieces fixed to the panel-sections and interposed between said panel-sections and the end sections, said angle-iron pieces having outwardly-extending flanges which bear against the inner sides of the end sections and thereby form internal braces adapted to maintain the end sections in relative position.

3. A door comprising stile-sections having locking-flanges, end sections having flanges interlocking with the stile-sections, panel-sections fashioned with molding portions which interlock with the stile-sections, said end sections having molding portions corresponding to the like portions of the panel-sections, the said molding portions of the end sections being provided with a concealed locking-flange, and angle-iron strips interposed between the end sections and the panel-sections and secured to the panel-sections, said strips each having outturned edges, one of said edges engaging with the said locking-flange of the molding portion of end section, and the other edge bearing edgewise against the inner side of the end section to form an internal brace and to maintain the end section in proper position.

4. In a sheet-metal door construction the combination with stile-sections, panel-sections, and end sections parallel with and spaced from the panel-section, of angle-iron strips interposed between the end sections and panel-sections, said strips being secured to the panel-sections and each having an edge portion turned substantially at right angles and bearing against the inner side of the adjacent end section whereby said end section is maintained in its normal position and inward pressure on said section is resisted.

5. In a sheet-metal door construction the combination with stile-sections, end sections, panel-sections, and interlocking connections between the stile-sections and the end sections and panel-sections, of a channel-iron or keeper secured between the outer edges of the stile-sections, said channel-irons having their flanges cut away at points, one for the application of the door-hinges and the other for the application of the door-lock.

6. In a sheet-metal door construction, the combination with hollow stiles and end sections, and a panel-section, of a lining of non-conducting material extending along the interior of the stiles, and a rigid backing between opposite members of the lining adapted to retain the lining in position.

7. In a sheet-metal door construction having hollow stiles and ends, and an intermediate panel, of an interior lining consisting of a sheet of non-conducting and indestructible material extending along each inner side of the stile, and a channel-iron intermediate of the sheets and having its flanges backing against the sheets to hold them against the inner sides of the stiles.

8. In a sheet-metal door construction the combination with stile-sections having locking-flanges along their inner edges, end sections, molding members extending along the inner edges of the stiles and end sections, the molding members of the stile-sections having flanges to interlock with the flanges of said stile-sections, a panel-section, said molding members of the stile-sections having recessed seats for the edges of the panel-section, and a supplemental molding-section coacting with a molding-section on one side of the door to complete the molding on that side, said supplemental molding-section having a vertical

wall coacting with a similar wall on the opposite molding-section to form the recess for the edge of the panel, and having a latch member to spring into engagement with a catch member of said opposite molding-section.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

NILS P. SJÖBRING.

Witnesses:
D. A. LUNDQUEST,
HJALMAN SANDBERG