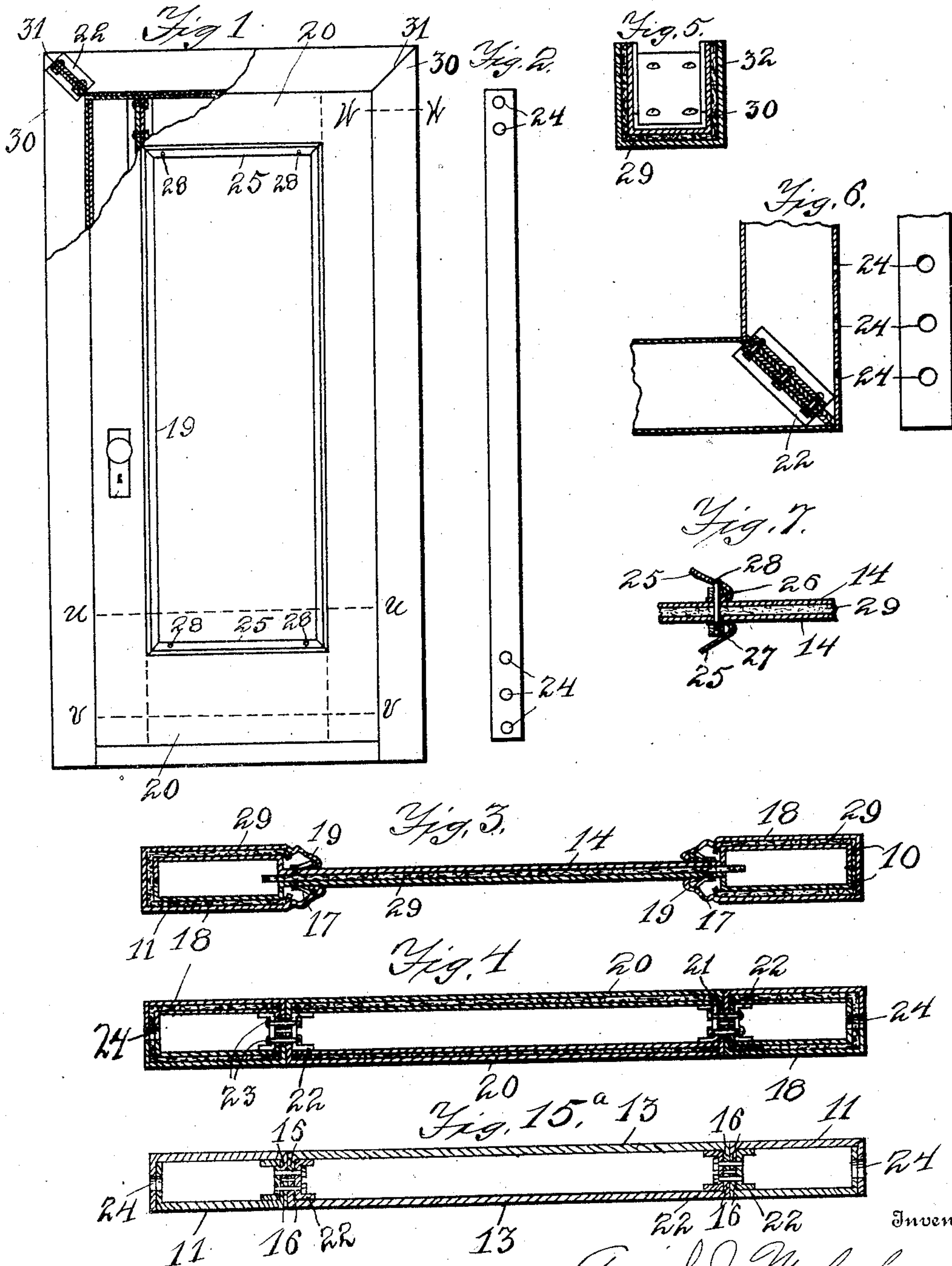


No. 836,885.

PATENTED NOV. 27, 1906.

A. J. MALMBERG.
METALLIC CONSTRUCTION.
APPLICATION FILED JULY 14, 1906.

3 SHEETS—SHEET 1.



Witnesses
J. A. Ellsworth.
Ernest Baller.

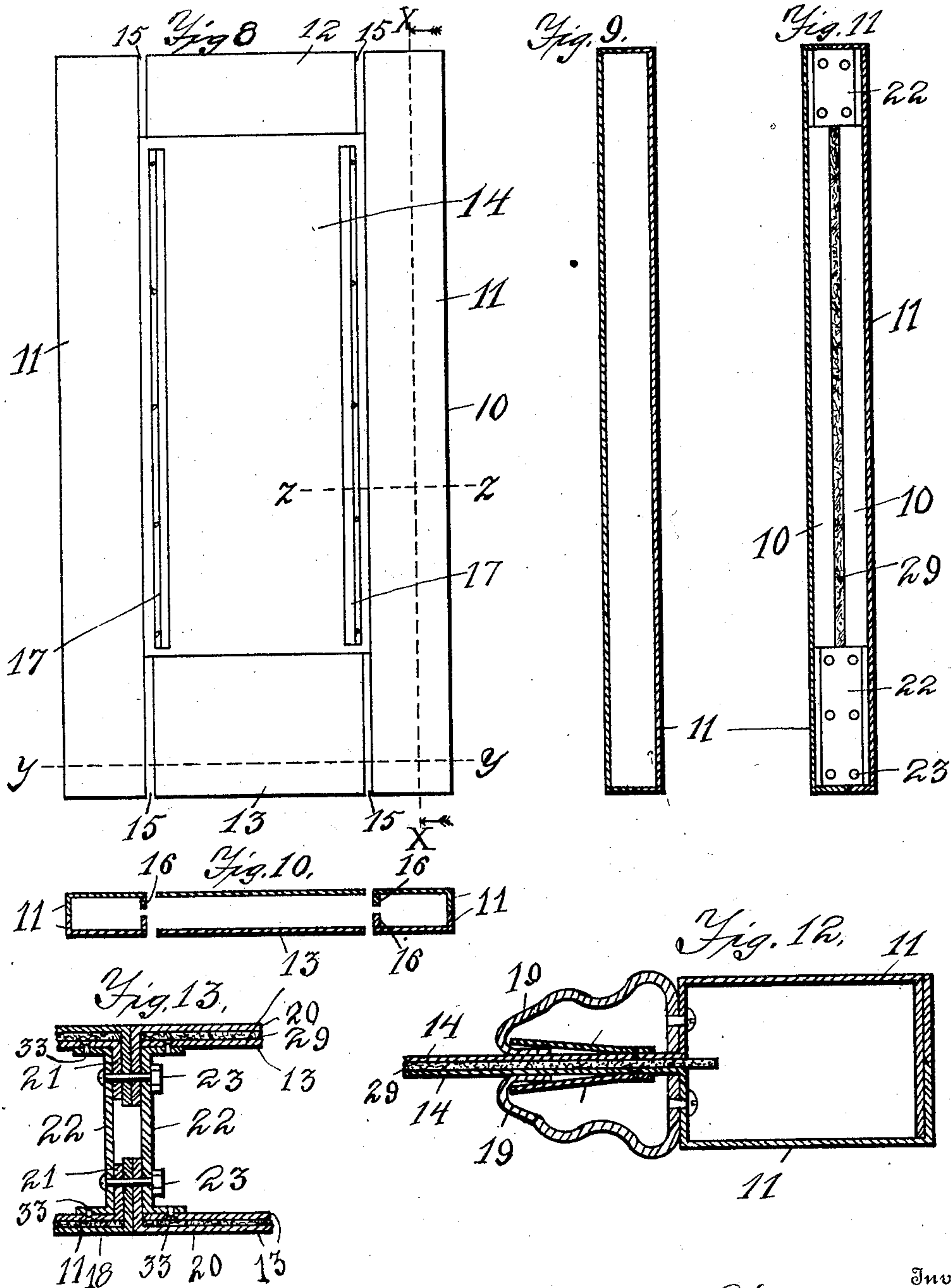
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3 SHEETS—SHEET 2



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3 SHEETS—SHEET 3.

Fig 14

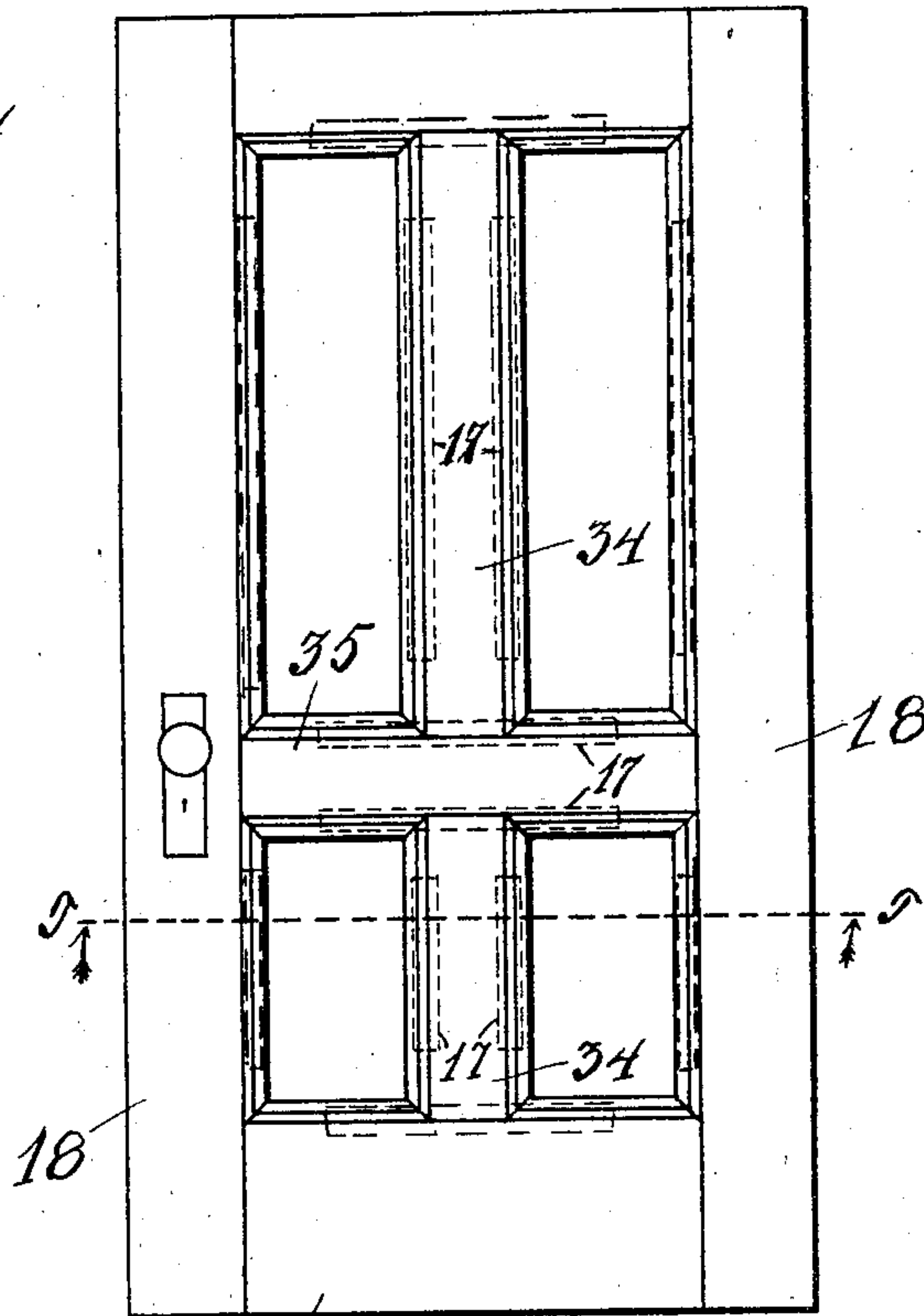


Fig 15,

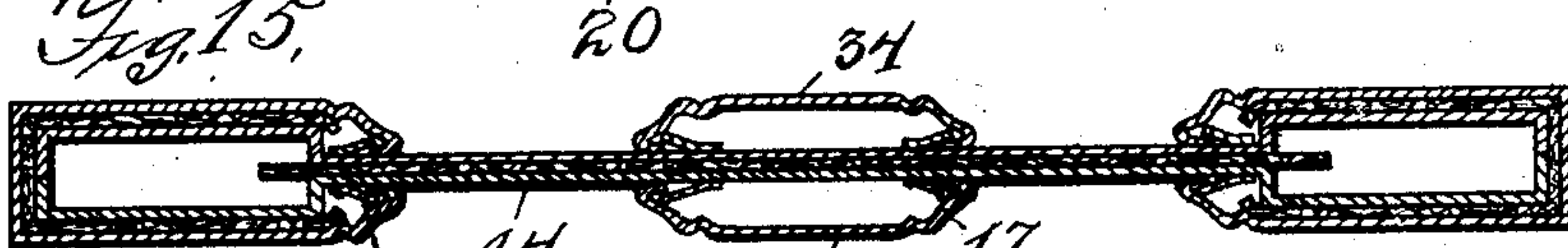
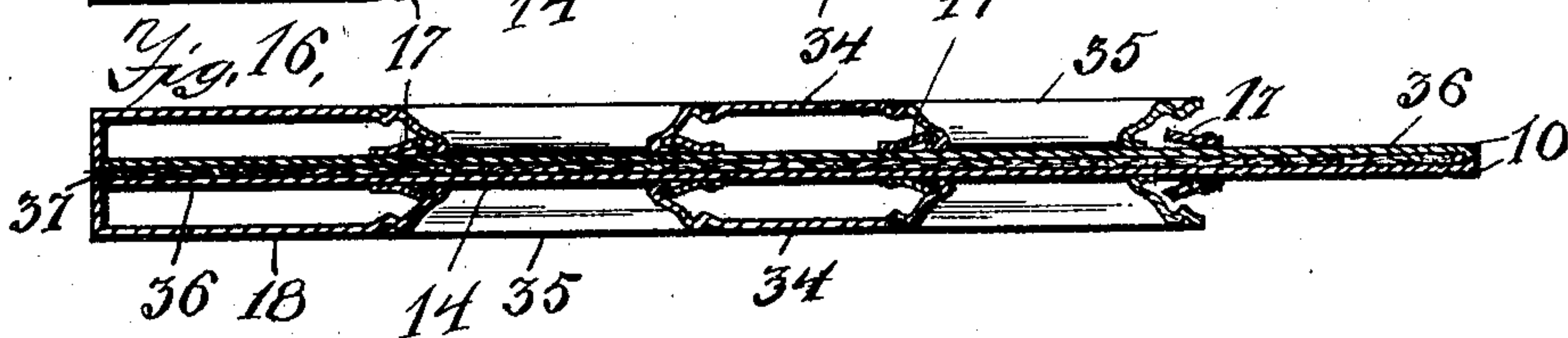


Fig 16,



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UNITED STATES PATENT OFFICE.

ARVID J. MALMBERG, OF JAMESTOWN, NEW YORK.

METALLIC CONSTRUCTION.

No. 836,885.

Specification of Letters Patent.

Patented Nov. 27, 1906.

Application filed July 14, 1906. Serial No. 326,180.

To all whom it may concern:

Be it known that I, ARVID J. MALMBERG, a subject of the King of Sweden, residing at Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Metallic Construction, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 The invention relates to sheet-metal construction, and particularly to metallic doors and casings; and the objects of the improvement are, first, to provide a door formed of two pieces and means within the door for connectively retaining said pieces; second, 15 to provide a simple and convenient means for dividing the door into panels and for attaching the molding; third, to provide over-stiles and overrails for extra strong fireproof construction, said overstiles and overrails forming a convenient means for holding sheet-asbestos firmly in place between the outer and inner stiles and rails, which, with heavy sheet-asbestos between the two parts 25 of the panel, make a complete covering of asbestos within the sheet metal for the entire door, and, fourth, to provide a casing for the door which is held at the corner-joints in the same manner as the retaining-joints of the door and may have sheet-asbestos between the outer and inner sheet-metal casings.

In the drawings, Figure 1 is an elevation of a simple form of door and casing. Fig. 2 is an edgewise view of the door, showing the 35 openings therein for admitting the tool. Fig. 3 is a sectional view at line U U in Fig. 1 of an extra covered fireproof door. Fig. 4 is a sectional view at line V V in Fig. 1 of an extra covered fireproof door. Fig. 5 is a sectional view of an extra covered casing at line W W in Fig. 1. Fig. 6 shows sectional and edge-wise views of a single-thickness door-corner, showing the application of the clamping means to a mitered door-corner. Fig. 7 is a 45 detail of the method of attaching the inner edges of the top and bottom overrails to the panel. Fig. 8 is a plan view of the sheet-metal half of the door, showing the slots for admitting the overrails and overstiles and the cleats on the panels for holding the inner edges of the molding. Fig. 9 is a sectional view at line X X in Fig. 8 of the two halves of the single-thickness door placed in proper position to form a hollow stile. Fig. 10 is a 55 sectional view at line Y Y in Fig. 8 of the inner-thickness door, showing the two halves

with edges abutting and slots for admitting the overstiles and overrails. Fig. 11 is a sectional view at line X X in Fig. 8, showing the single-thickness door with the two halves 60 in position and showing the elevation of the channel-clamping plate and the edge of the asbestos between the panels. Fig. 12 is a sectional view of the single-thickness door with a simple modification of the molding 65 around the panel. Fig. 13 is a sectional view of the single-thickness door at line V V in Fig. 1, showing the panel-clamping pieces for holding the two halves of the door firmly together. Fig. 14 is a plan view of the panel- 70 door, showing the use of cleats and panel-molding for middle rail and middle stile or montant. Fig. 15 is a sectional view at line T T in Fig. 14. Fig. 15^a is a sectional view of a modified construction. Fig. 16 is a sectional view at line T T in Fig. 14, showing the 75 modification of my construction in which the stiles are not struck up on the halves of the door.

Similar numerals refer to corresponding 80 parts in the several views.

The numeral 10 indicates the sheet-metal half of the door, the division being made around the edge of the door. In a single-thickness door the edges preferably lap the 85 entire width of the edge of the door, so that they may be fastened to one another by means of solder or rivets, as desired. For the extra-thickness fireproof door the division is preferably made midway of the edge, so that 90 the halves can be placed with edges abutting, and thereby form a smooth edge for covering with the asbestos and overstiles. Each half is struck up from one piece of sheet metal, so as to form in each piece one-half of the stiles 95 11, the top cross-rail 12, the bottom cross-rail 13, and the central panel 14.

The simplest form of my door is made as follows: The ends of the cross-rails 12 and 13 and the side of the stiles 11 adjacent to said 100 ends are turned inwardly, so as to form a flange 16, preferably on both parts, as shown in Fig. 15^a. Inturned flanges 16 are secured by channel clamping-pieces 22 and screw-bolts 23, thus holding the two sides firmly in place by means of these channel clamping- 105 pieces within the door. In order to insert screw-bolts 23, openings 24 are provided in the edges of the door, which openings are closed by brazed plugs in finishing the door. 110

In order to attach the molding and middle rail and stiles to panel 14, cleats 17 are riv-

eted to panel 14. The edge of the molding is hooked underneath cleats 17, as shown. For the simpler form of molding 19, as shown in Fig. 12, the inner edge is hooked beneath the cleat 17 and the outer edge is turned inwardly against the stile and secured by a screw from inside the stile, which screw may be inserted before the halves of the door are put in place. It is apparent, however, that when it is desired to make a door with a number of panels the middle rail and stiles may easily be formed by forming each edge of the montant 34 or rail 35 in the molding, and the cleats 17 are riveted onto the plates at the exact distance apart to allow the slipping of the inturned edges of the molding beneath the cleats. In so forming the middle rails and stiles the cleats 17 should not extend too close to the raised stile 11, since it would be impossible to slip the middle rail 35 beneath the cleats 17 if the cleats 17 extended clear up to the raised stile. Accordingly the cleats 17 are placed so that there is a space between the ends of the cleats and the raised stile 11, as shown in dotted line in Fig. 14. The sheet metal is sufficiently stiff to hold the inner edge in place for this short space without the cleats 17.

It is apparent that the turning in of the ends of the cross-rails and the adjacent edges of the stiles forms a cut or slot in the sheet-metal half 10 and that this cut may be pressed together, so that the same may be made flush in finishing over the same, and thus give a smooth appearance to the outside of the door in the simple form of door, as shown in section in Fig. 15^a. This cut between the flanges 16 is simply widened to make the slot 15 for the insertion of the over-stiles 18 and overrails 20, as shown in Figs. 8, 10, and 13.

In order to give extra strong fireproof protection, slots 15 are widened in halves 10 between the ends of the cross-rails and the stiles at each end of the door, the edge of the stiles being turned in an inward flange 16. Cleats 17 are riveted lengthwise of panel 14 just inside of stiles 11. The two sheet-metal halves 10 are placed with abutting edges and an outer cover 18 for the stiles, which I have called an "overstile," is then slipped onto stile 11. Overstile 18 is formed with a molded inner edge 19 the length of panel 14 and has inturned edges which hook underneath cleats 17 as the overstile is slipped into place, thereby firmly holding the inner edges of the overstile on each side of the door the full length of panel 14. The edges of the overstile 18 opposite the ends of cross-rails 12 and 13 are turned inwardly through slots 15.

Overrails 20 are provided for cross-rails 12 and 13. The ends 21 of the overrails are turned inwardly through slots 15, as shown in Fig. 4. The inturned flanges 21 and 16 of the overstile and the half-door 10 are then

securely held by means of channel clamping-irons 22 on each side of the flanges and screw-bolts 23. The channel-irons 22 preferably extend the length of the slots 15, and the openings 24 in the edges of the door are provided in the overstile the same as in the simple form of door, as above described.

The inner edges of overrails 20 may usually be held beneath the cleats 17, as above described, only the cleats do not extend entirely across the distance between the stiles. In some forms of doors, however, it is desirable to provide another holding means for the inner edges 25 of the overrails, as in the case of so short a rail that the metal cannot be sprung down beneath the cleats 17. For such cases cross-bars 26 and 27 are inserted within molding 25, (see Fig. 7,) the cross-bar 27 having threaded openings therein. The small screws 28 are then inserted through the molding and bar 26 at one side and screwed into lengthwise bar 27. After setting the screw firmly to place the head of screw 28 is polished down even with the surface of molding 25, so that it does not show and makes a smooth finish for the molding, as well as a solid holding means for the two inner edges of the overrail 20.

A sheet of asbestos 29 is slipped between the inner stile 11 and the outer stile 18 as the outer stile is slipped into place, thereby completely covering the outer and inner edges of the door. Like sheets are also provided between the outer and inner cross-rails and a sheet is also inserted between the two parts of panel 14, thereby providing an asbestos covering within the door over its entire surface, the overstiles and rails holding the sheet-asbestos firmly in place, so that it cannot slip or work to one side and leave any part of sheet-metal door unprotected.

It is oftentimes desirable to form doors with small panels by means of middle stiles 34 and rails 35 with cleats 17, and for this purpose it is often more convenient to form the two halves 10 flat and place them parallel, as shown at 36 in the modified form shown in Fig. 16. It is apparent that the middle rail and stiles can be slipped onto this form with perfect ease and that the overstile 18 will be held in place by cleats 17. A small rivet 37 may be inserted through the outer edge of the overstile and inner half 10 in order to hold the parts in place with great firmness, so that they cannot give. This is not usually found necessary; however, if the inner part is pressed firmly against the over-rail.

It is apparent that the slots at each corner of the door may be cut on a miter and clamped together by means of clamping-pieces 22, as shown in Fig. 6. It is also obvious that this forms a very convenient and practical method of construction for the sheet metal door-easing 30, the mitered cor-

ners 31 being turned inwardly and held by clamping-pieces 22, as shown in Figs. 1 and 5. Also an overcasing 23 may be provided and sheet-asbestos 29 placed between the outer and inner casing, thereby completely protecting the door and the casing with fire-proof material.

Channel-irons 22 usually fit sufficiently close at the sides to press the sheet metal firmly to place. It would not depart from my invention to insert rivets 33, as shown in Fig. 13, through the flanged edges of the clamping channel-irons and the adjacent sides, thereby holding all parts firmly in place. All such rivet-heads and joints are covered by the enameled finish which is used on such metallic construction. This method of construction forms a convenient manner of finishing sheet-bronze doors with the all-metal finish, the joints being made flush and the clamping means being entirely out of sight within the door.

I claim as new—

1. In hollow metallic construction for doors and the like, oppositely-placed sheet-metal parts having oppositely-inturned flanges thereon, and clamping-pieces for said oppositely-placed flanges between said parts to unite the same.

2. In metallic construction, a door comprising two halves, each struck up from a single sheet of metal to form semistiles and rails and connecting-panels, inturned lips on each of said halves, and clamping means for said lips between said halves to unite them in a door.

3. In metallic construction, a door comprising two struck-up sheet-metal halves dividing around the edge of the door, inturned flanges on each of said halves, and clamping-pieces for said flanges between said halves.

4. In metallic construction, a door comprising two sheet-metal halves dividing around the edge of the door, said halves struck up to form stiles and rails and connecting-panels, the ends of said rails and the sides of the stiles adjacent to said rail ends projected inward, and screw-bolts and clamping-pieces to hold said inward projections between said halves.

5. In metallic construction, a door comprising two struck-up sheet-metal halves dividing around the edge of the door, and outer sheet-metal coverings for the stiles and rails to hold said halves and form a hollow sheet-metal door.

6. In metallic construction, a door comprising two sheet-metal halves dividing around the edge of the door, each of said halves struck up to form semistiles and rails, and sheet-metal overstyles and overrails extending around said divided edges to bind them together.

7. In metallic construction, a door comprising two sheet-metal halves struck up with

stiles and rails, and slots between the ends of said rails and the stiles, overstyles and overrails having projections into said slots, and means for holding said projections within the door.

8. In metallic construction, a door comprising two sheet-metal halves struck up with stiles and rails and slots between the stiles and the ends of said rails, overstyles and overrails having projections in the said slots, and clamping-pieces within the door to hold said projections.

9. In metallic construction, a door comprising two sheet-metal halves struck up with stiles and rails, and slots between said stiles and the ends of said rails, overstyles and overrails projecting into said slots, sheet-asbestos between said halves and said outer and inner rails and stiles, and holding means within the door for said projection.

10. In metallic construction, a door comprising two sheet-metal halves struck up with stiles and rails having slots between said stiles in the ends of said rails overstyles and overrails with flanged inserts in said slots, and channel clamping-pieces and screw-bolts within said door to hold said flanged inserts.

11. In metallic construction, a door, cleats on said door, and molding slidably engaging beneath said cleats to form a panel.

12. In metallic construction, a door, spaced cleats on said door, and molding having inturned edges to hold under said cleats and form panels.

13. In metallic construction, a door, cleats on said door, and stiles and rails having lipped edges to hold under said cleats and form panels.

14. In metallic construction, a door, spaced cleats on said door, stiles and rails having lipped edges to hook under said cleats, and middle rails and montants having double-lipped edges to hold under said cleats and form a plurality of panels.

15. In metallic construction, a door, oppositely-placed plates to form the sides of the door, strips attached to said plates, having raised edges and stile and rail moldings having lipped edges to hook under said strips and form panels.

16. In metallic construction, a door comprising two sheet-metal halves struck up with stiles and rails and panels, cleats on said panels adjacent to said stiles, said halves having slots between said stiles and the ends of said rails, overstyles having inturned edges engaging said cleats and projections in said slot, overrails having projections in said slots, and channel clamping-pieces and screw-bolts within said halves to hold said projections.

17. In metallic construction, a door comprising two sheet-metal halves struck up with stiles and rails, overstyles and overrails

formed with intumed lips, a bar within said lips on each side of said door, and screws engaging said bars to clamp said inner edges.

18. In metallic construction, a jamb substantially U-shaped having inwardly-projecting flanges at their upper ends, a lintel substantially U-shaped having inwardly-projecting flanges at each end, channel-iron clamping-pieces within said lintel and jambs each side of said flanges, and screw-bolts to hold said channel-irons.

19. In metallic construction, a jamb substantially U-shaped, a lintel substantially U-

shaped, overjambs and overlintels substantially U-shaped having inwardly-projecting flanges at the connecting-joints, and sheet asbestos between said outer and inner lintels and jambs, and clamping-pieces to hold said flanged inserts.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARVID J. MALMBERG.

Witnesses:

HJALMAR MALMBERG,
A. W. KETTLE.