

Dec. 14, 1943.

J. F. PEELLE

2,336,999

FORMED METAL DOOR

Filed Feb. 13, 1942

2 Sheets-Sheet 2

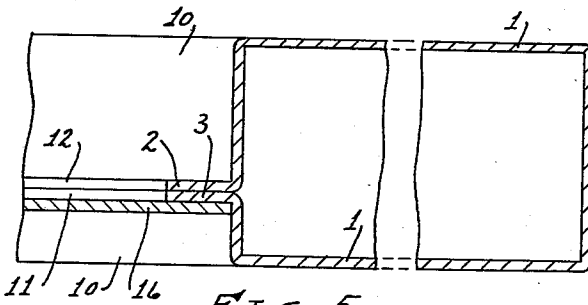


FIG. 5.

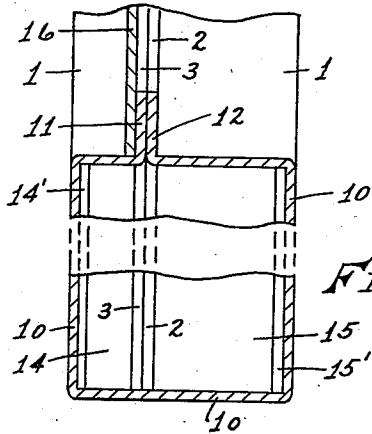


FIG. 7.

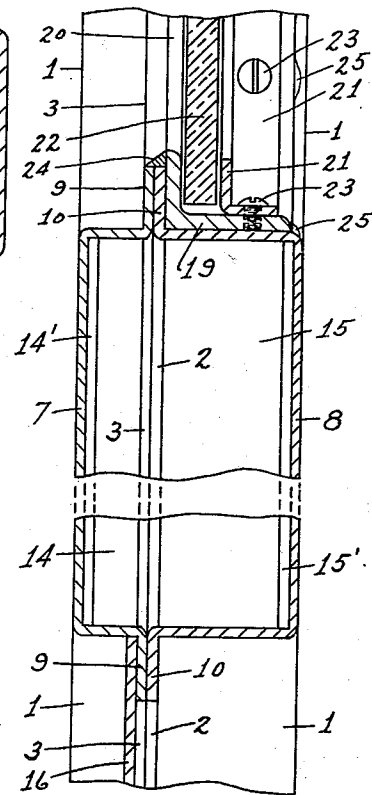


FIG. 6.

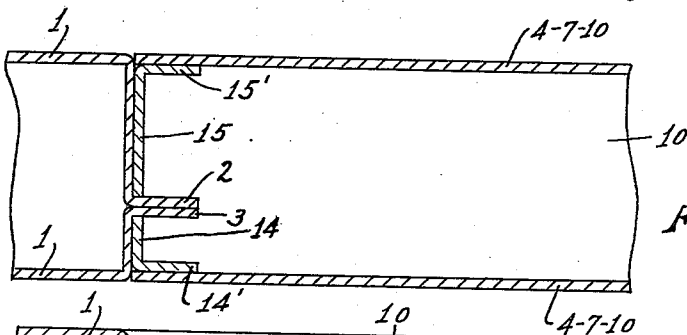


FIG. 8.

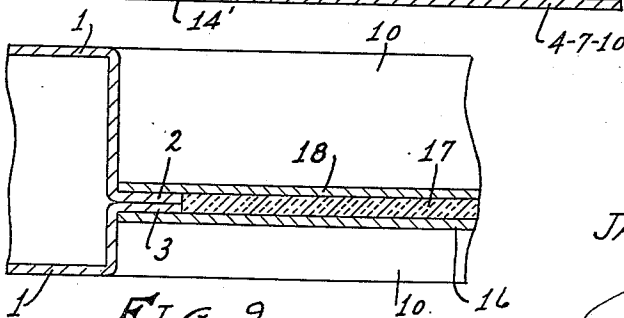


FIG. 9.

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UNITED STATES PATENT OFFICE

2,336,999

FORMED METAL DOOR

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Application February 13, 1942, Serial No. 430,713

5 Claims. (Cl. 189-46)

I am aware that formed metal doors, or tubular steel doors as they are better known to the trade, are old in the art, but the same as previously manufactured, have been expensive and have required much leveling after assembly due to the fact that a satisfactory method of construction had not been perfected. The joints formed at the junctures of the stile and rail members required excessive welding and grinding in order to present a neat and finished appearance.

The principal object of the present invention is the provision of means which gauge the laying together of stile and rail members with accuracy by semi-skilled workmen, and which present flush surfaces after being laid together and welded, thereby eliminating excess leveling and grinding.

A second object of the invention is the provision of a formed metal door having stiles, rails, and panels, in which the framework comprising the stiles and rails are completely assembled, after which metal panels or sash are welded therein.

A third object of the invention is the provision of a formed metal door comprising stiles and rails assembled integrally leaving openings therein, and with either metal panels or pre-assembled sash members being fitted into the openings formed by the stile and rail members.

Further objects of the invention are the provision of a formed metal door which is easily and accurately assembled from pre-formed members, which is rigid, which is economical to manufacture, and which has high fire-resistant value.

Other objects and advantages of the invention will suggest themselves in the course of the following description, and that which is new will be pointed out in the appended claims.

The most satisfactory means for carrying out the principles of the invention in a practical and efficient manner is shown in the accompanying two sheets of drawings, in which:

Figure 1 is an elevational detail of a metal door embodying the principles of the invention.

Figure 2 is a detail vertical section through the upper edge of the door as taken on line 2-2 of Figure 1.

Figure 3 is a detail section through one of the stile members taken on line 3-3 of Figure 1 and showing the method of securing pre-assembled sash members thereinto.

Figure 4 is a detail section through a muntin bar assembly taken on line 4-4 of Figure 1.

Figure 5 is a detail section taken on line 5-5 of Figure 1 showing the method of securing a metal panel in the door.

Figure 6 is a detail vertical section through the intermediate rail member taken on line 6-6 of Figure 1.

Figure 7 is a detail vertical section through the lower edge of the door showing the construction thereof as taken on line 7-7 of Figure 1.

Figure 8 is a detail section through the juncture of stile and rail members taken on lines 8-8 of Figure 1, showing the means for gauging the rail members with relation to the stile members at the juncture thereof.

Figure 9 is a detail section through the panel member similar to Figure 5 but showing a modified form, the same showing means providing fire-resistant material in the panel.

Like characters designate like parts throughout the several views.

In order that the construction and the advantages of the invention may be more fully understood and appreciated, I will now take up a detailed description thereof, in which I will set forth the same as fully and as comprehensively as I may.

In the drawings, numeral 1 designates formed stile members, the same being formed tubular in shape with companion flanges 2 and 3 being formed by the edges thereof, and with said flanges being welded or otherwise suitably secured together. The top rail is composed of the tubular-shaped member 4 having flanges 5 and 6 formed thereon and secured together, and with the flanges 5 and 6 being coped to fit between the flanges 2 and 3 of the stiles 1.

The center or intermediate rail is formed of the two channel-shaped members 7 and 8 with flanges 9 being formed on the member 7 and flanges 10 being formed on the member 8. Flanges 9 and 10 are coped to fit between flanges 2 and 3 of members 1, and are welded together and to flanges 2 and 3 at the junctures thereof.

The bottom rail of the door is formed of the member 11 which has companion flanges 12 and 13 formed thereon and which are secured together, and with the flanges 12 and 13 being coped at their ends to fit between flanges 2 and 3 of the stiles 1.

In assembling the stile and rail members, angle members 14 and 15 are welded onto the stile members 1 in the manner shown more clearly in Figure 8, and with outstanding legs 14' and 15' respectively being formed thereon. The angles 14 and 15 are made of such size as to form spac-

ing means for the members 4, 7, and 10, and to permit the outer faces thereof to finish flush with the faces of the stile members 1. The spacing angle members 14 and 15 also form inner supports to the ends of the members 4, 7, and 10. It is obvious to those skilled in the art that the members 14 and 15 provide a simplified and accurate means of bringing the end portions of the rail members flush with the face surfaces of the stile members. The stile and rail members are welded together at the junctures thereof and forming a one-piece door.

A panel member 16 is shown positioned in the lower portion of the door in the space formed by the members 1, 7, and 10. The panel is set into the door against the flanges 3, 9, and 11 and is welded or otherwise suitably secured therethrough. The panel may be formed of a single sheet of metal as shown in Figures 5, 6, and 7, or the same may be insulated by the addition of insulating material 17 set between the flanges of members 1, 7, and 10, and held therein by means of a second metal panel 18, all as shown in Figure 9.

When it is desired to provide glazed panels in the door, a sash composed of frame angles 19 are assembled before insertion in the door. T-shaped muntin bars 20 are provided to divide the opening formed by the frame angles 19 into a plurality of smaller spaces. The muntins 20 are coped together at their junctures and the ends thereof are coped to fit the frame angle 19, with the entire assembly being welded together. Glazing angles 21 are provided as staying means for the glass panels 22. The glazing angles 21 are removably secured to the respective members 19 and 20 by means of threaded screws 23. After the sash members are assembled, the assembly is inserted in the opening formed by members 2, 4, and 7 with one leg of the frame angle 19 being set against the respective flanges 2, 5, and 10. It is preferable to have the leg of the frame angle to project above the adjacent flanges in order that the sash assembly may be secured into the door by welding as shown at 24. The weld 24 is preferably continuous around the sash assembly to provide weathertight joints. Additional welds 25 secure the outstanding legs of the members 19 to the respective stile and rail members as shown in Figures 2, 3, 4, and 6. Welds 25 may be either continuous or intermittent.

It will be obvious to those skilled in the art that a door formed as above described is light in weight, is easy of assembly, and may be of any desired design as to arrangement of both panel and glass divisions. It is also obvious that the door is substantially built and is suitable for use in industrial buildings where doors are subject to extremely hard usage. It is also to be pointed out that the door has high fire-resistant value, there being no combustible materials in the construction thereof.

It is to be understood that I am not to be limited to the exact arrangement of the members as shown, but that minor changes may be made therein insofar as the changes may fall within the scope of the appended claims.

Having now fully shown and described the in-

vention, what I claim, and desire to secure by Letters Patent of the United States, is:

1. In formed metal doors, the combination of stile and rail members, each having inwardly-extending companion flanges formed thereon with the companion flanges of each of the stile and rail members being in secured contacting relation, spacing members bearing against the inwardly-extending companion flanges and secured to the stile members at the junctures of the rail members therewith.

2. In formed metal doors, the combination of stile and rail members, each having inwardly-extending companion flanges formed thereon with the companion flanges of each stile and rail member being in secured contacting relation, spacing members secured to the stile members and bearing against the inwardly-extending companion flanges thereof at the junctures of the stile and rail members and with said members forming fixed means spacing the faces of the rail members in flush relation with the adjacent surfaces of the stile members.

3. In a formed metal door, a pair of stile members, each having inwardly-extending companion flanges formed integrally therewith with the companion flanges being in secured contacting relation, rail members extending between the stile members with integral inwardly-extending companion flanges formed thereon, angle spacing members secured to the stile members and bearing against the inwardly-extending flanges thereof and providing support to the ends of the rail members at the junctures thereof with the stile members, and with a metal panel being set into the door against the inwardly-extending companion flanges of the stile and rail members and secured therethrough.

4. A formed metal door composed of stiles and rails, inwardly-extending companion flanges formed on each of the stiles and rails with the companion flanges being in secured contacting relation, spacing angles having one leg thereof secured to the stile members and bearing against the inwardly-extending flanges thereof at the junctures of the stile and rail members, and with the second leg of the spacing angles extending inwardly and providing support to the inner side of the rails and spacing the face portions of the ends of the rails in flush relation with the adjacent surface of the stile members.

5. A formed metal door composed of stiles and rails, inwardly-extending companion flanges formed on the inner edge of each of the stiles and rails with the companion flanges being in secured contacting relation, spacing angles, each having one leg thereof secured to the inner surface of the stiles at the juncture of the stiles and rails and with the edge of the secured leg bearing against the companion flanges formed on the stiles, and with the second leg of the spacing angle extending inwardly from the respective stile and forming an inner support to the respective end of a rail member, and providing means positioning the end portion of the rail in flush relation with the adjacent surfaces of the adjacent stile member.

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