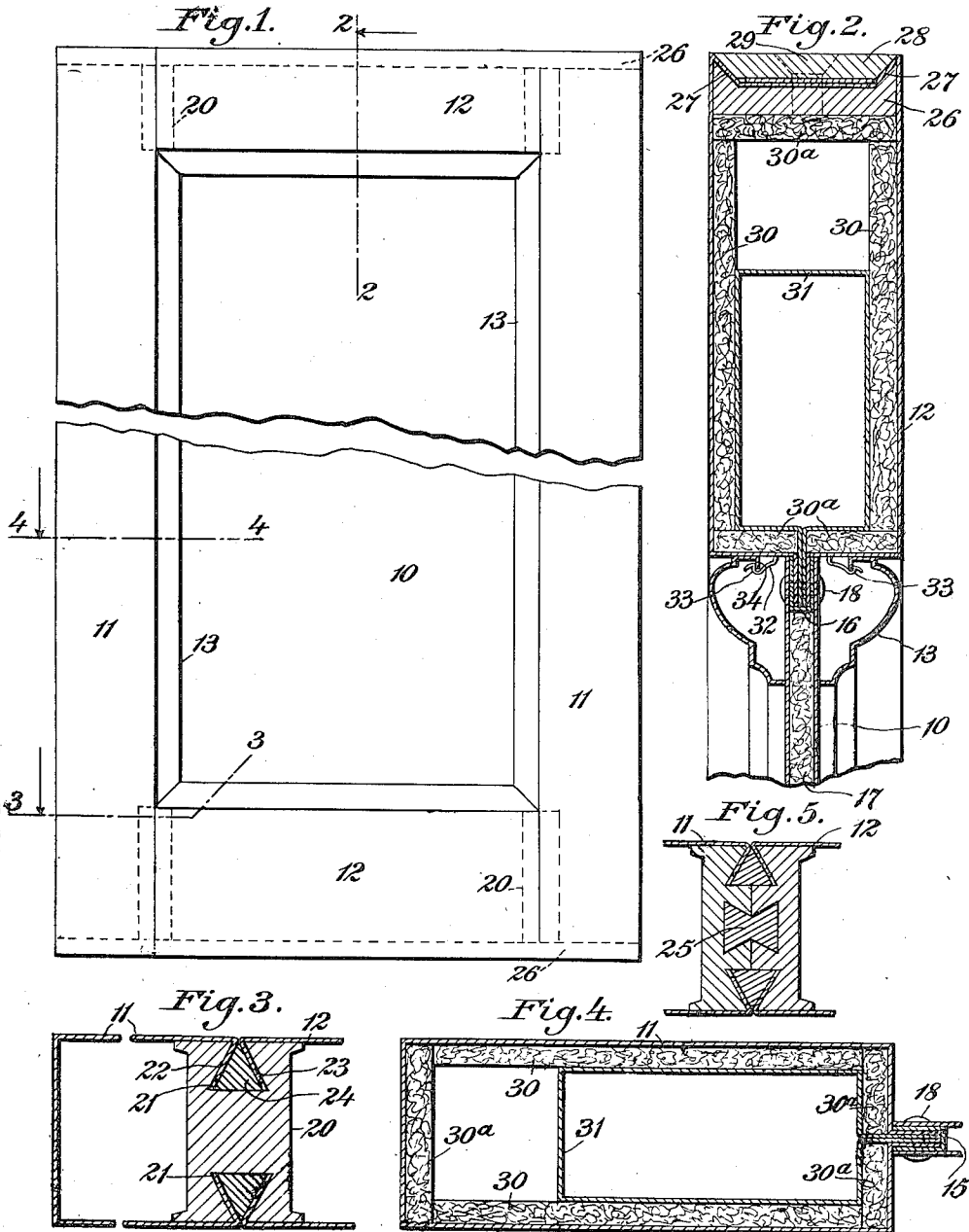


C. E. NELLIS.
SHEET METAL STRUCTURE.
APPLICATION FILED APR. 14, 1909.

1,009,089.

Patented Nov. 21, 1911.



Witnesses:

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UNITED STATES PATENT OFFICE.

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SHEET-METAL STRUCTURE.

1,009,089.

Specification of Letters Patent.

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Application filed April 14, 1909. Serial No. 489,838.

To all whom it may concern:

Be it known that I, CHARLES E. NELLIS, a citizen of the United States, and a resident of the city of New York, county of Queens, and State of New York, have invented certain new and useful Improvements in Sheet-Metal Structures, of which the following is a specification.

This invention relates to sheet metal structures and improved means for locking the component parts of such structures together.

In the accompanying drawings I have illustrated preferred forms of my invention applied to a sheet metal fire proof door, and in such drawings:

Figure 1 is an elevation of a sheet metal door constructed in accordance with my invention. Figs. 2, 3, and 4 are sectional views on enlarged scale on the lines 2—2, 3—3, and 4—4 respectively of Fig. 1. Fig. 5 is a sectional view of a modified form of a coupling device.

The door illustrated in Fig. 1 is intended to have substantially the same appearance on both sides. The panel is indicated by 10, the stiles by 11, the rails by 12, and the molding by 13.

As shown the stiles are each formed of a single strip of sheet metal preferably spring metal bent to form a hollow rectangular body and the longitudinal edge portions of the strip are bent at a right angle to the inner edge of the stile and embraced by a channel bar 15. The rails are preferably formed of two strips of metal also bent to form a hollow rectangular body with their inner edge portions bent at a right angle to the inner edges of the rail and embraced by a channel bar 16.

The panels consist of two parallel plates of metal with an asbestos filling 17 between them and the edge portions of these plates respectively engage the channel bars 15 and 16 on opposite sides thereof and are secured thereto by rivets 18 which pass through the plates, the channel bars and the edge portions of the stiles and rails embraced by said channel bars.

The channel bars 15 and 16 do not extend beyond the edges of the panel plates and in order to secure the stiles to the rails I employ a coupling device best shown in Fig. 3. This coupling device consists of a block preferably of metal although it may be of other substantially fire-proof material,

and the block is provided with two oppositely arranged dove-tail or under cut grooves 21, into which edge portions 22 of the stile and end portions 23 of the rail extend and when a triangular key 24 is driven into the respective grooves the said edge and end portions of the stiles and rails will be spread apart and securely clamped between the opposing surfaces of the grooves and keys. Four of these coupling devices are employed, one near each corner of the door.

In Fig. 5 I have shown a modified form of coupling device in which the block is formed of two sections connected together by a key 25. The coupling devices terminate some distance from the ends of the door as indicated by the dotted lines in Fig. 1. Across the door at each end a channel bar 26 extends and rests against the ends of the coupling pieces as clearly indicated by dotted lines in Fig. 1. The edge portions of the stiles are cut away in line with the outer ends of the coupling devices and the ends of the bars 26 are flush with the side edges of the door. The top and bottom edge portions 27 of the stiles and rails are folded over into the channel bars as indicated in Fig. 2 and a clamping bar 28 is then secured to each channel bar 26 by means of screws 29 or similar fastening devices and the stiles, rails and panel plates will then be rigidly secured together. The bars 26 and 28 and the coupling devices also increase the rigidity of the door so that it will not be liable to get out of shape in use. To further stiffen the rails and stile and increase their fire resisting qualities, I provide sheets of asbestos 30 which are held against the inner surfaces of the front and rear sides of the stiles and rails by braces 31 as clearly shown in Figs. 2 and 4. As shown these braces are made of sheet metal bent to substantially the same form as the stiles and the edge portions of the braces extend between the edge portions of the stiles and rails embraced by the channel bars 15 and 16 and the rivets 18 pass through them and thus hold the braces securely in position. Sheets of asbestos are also supported against the edge portions of the stiles and rails by the sheets 30.

As shown, the molding 13 is connected to the door as follows: Lugs 32 are struck up from the inner edges of the rails and stiles on each side of the panel. Two of these

lugs are illustrated in Fig. 2, one on each side of the panel and it is to be understood that as many of these legs as may be desirable will be struck up from each stile and rail.

5 Each lug is provided with a shoulder 33 and the edge of the molding 13, which is adjacent to a rail or stile is bent inwardly to form a shoulder 34 adapted to interlock with the alined shoulders 33 of the lugs

10 struck up from the rails or stiles. As before stated the metal of which the rails and stiles are formed will preferably be spring metal and either the shoulders on the rails or stiles or the shoulder on the molding should preferably have a tapered portion in advance thereof. In the drawing this tapered portion is shown on the lugs. The molding is first cut to the proper length and mitered and each piece can be forced into position,

20 the lugs 32 will first yield to permit the shoulder on the molding to pass and will then spring back and interlock the shoulders 33 and 34 and thus securely hold the molding in position. The interlocking shoulders may be formed in other ways than that illustrated and either may be yieldable to permit the passage of one past the other and then cause the interlocking. The molding will hide the rivets 18 from view.

30 While I have illustrated my invention as applied to a door, some features thereof may be applied equally well to other sheet metal structures and it is therefore to be understood that my invention is not restricted in its use to doors.

Having described my invention, I claim:—

1. In sheet metal structures, the combination with a sheet metal support having a projecting shoulder, of molding also having a shoulder, one of said shoulders being yieldable to permit the other to pass by it and then to cause the shoulders to interlock.

2. In sheet metal structures, the combination with a sheet metal support having lugs struck up therefrom and each lug having a shoulder, of molding having a shoulder at one edge to interlock with the shoulders on the lugs.

3. In sheet metal structures, the combination with a sheet metal support having spring lugs struck up therefrom, each lug having a shoulder and the shoulders being in alinement, of molding having a shoulder at one edge to interlock with the shoulders on the lugs.

4. In a sheet metal door, the combination with the panel, the stiles and rails, said stiles and rails being formed of spring metal and having lugs struck up therefrom, each lug

having a shoulder and the shoulders on each 60 rail and each stile being in alinement, and pieces of molding each having a shoulder at one edge to interlock with the shoulders on the respective rails and stiles whereby the molding is held in position against the 65 panel, stiles and rails.

5. In a sheet metal door, the combination with a stile and rail, of a coupling comprising a block having undercut grooves on opposite sides to receive portions of the metal 70 of a stile and end portions of the metal of a rail, and keys of substantially the same form as the groove for clamping said portions of the metal between them and opposite walls of the respective grooves. 75

6. A device for coupling adjacent edge portions of two separate pieces of sheet metal comprising a block having a dove-tail groove into which the said edge portions may extend, and a triangular key to be 80 fitted in said groove between said edge portions.

7. A device for coupling adjacent edge portions of two separate pieces of sheet metal comprising a block having undercut 85 grooves on opposite sides thereof into which the said edge portions may extend, and triangular keys to be fitted in said grooves between said edge portions, and said block being formed of two sections locked together 90 by a key.

8. In a sheet metal door, the combination with the rails and stiles, each rail and stile being hollow and having their inner edge portions bent at substantially a right angle 95 to the inner faces of the respective rails and stiles, of channel bars fitted over the said portions, two panel plates arranged respectively on opposite sides of said channel bars, and rivets extending through the plates, 100 channel bars, and the inclosed edge portions.

9. A trim fastening, comprising a trim having a flange, and a support for the trim having spaced members between which the flange is adapted to be driven, the said flange 105 and the inner face of the outer one of said spaced members being provided with integral interlocking means adapted to engage each other when the flange is forced between the said members. 110

In witness whereof, I have hereunto set my hand to the foregoing specification in the presence of two subscribing witnesses.

CHARLES E. NELLIS.

Witnesses:

JOS. F. O'BRIEN,
P. FRANK SONNEK.