

R. D. MAYO.
METAL DOOR.

APPLICATION FILED NOV. 25, 1910.

Patented Apr. 18, 1911.

990,151.

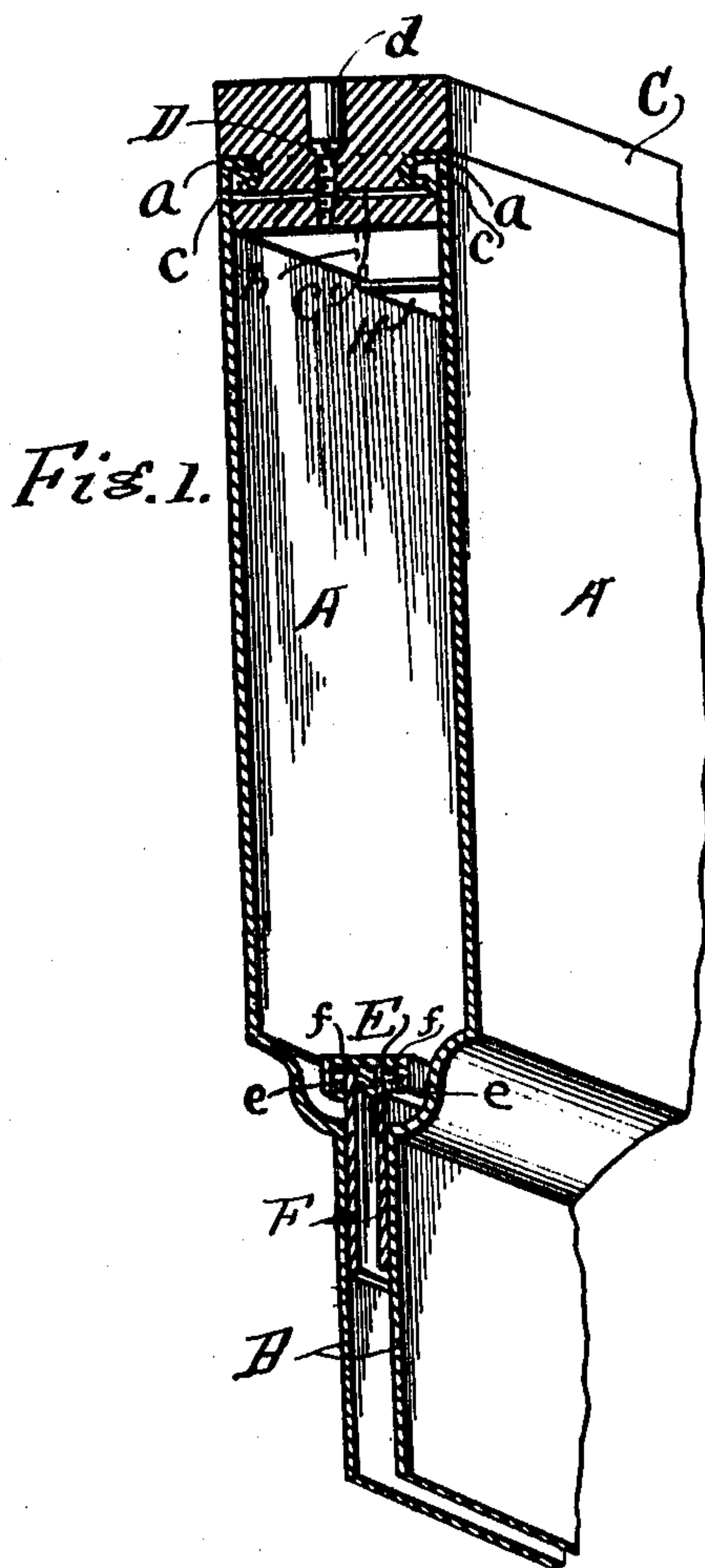


Fig. 1.

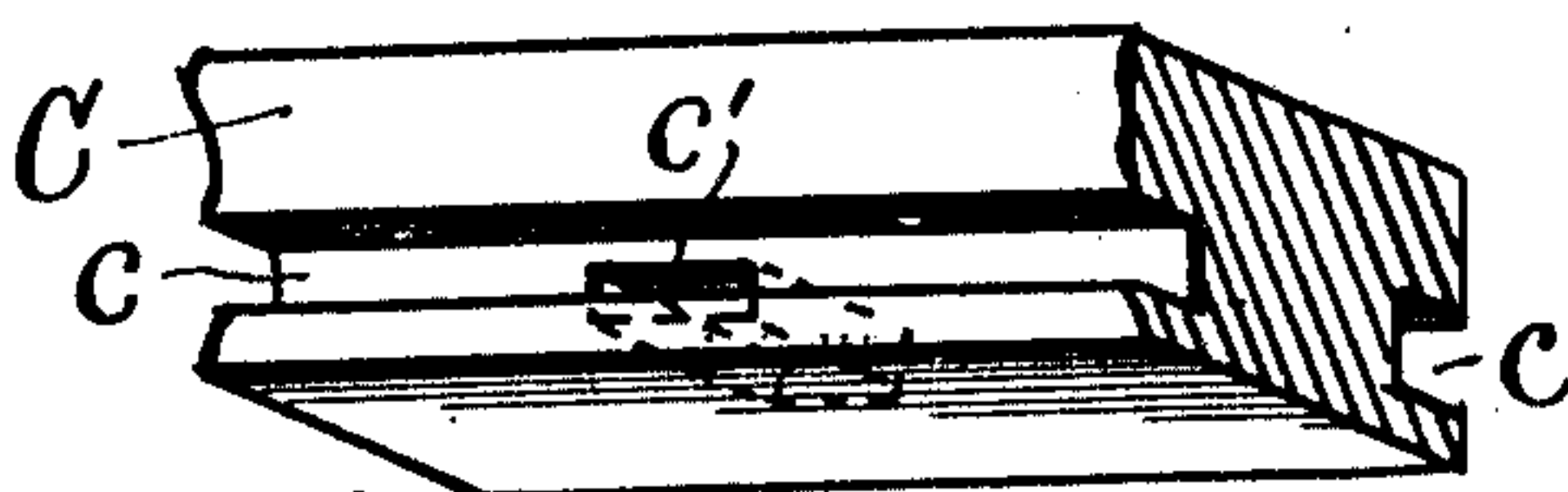


Fig. 2.



Fig. 4.

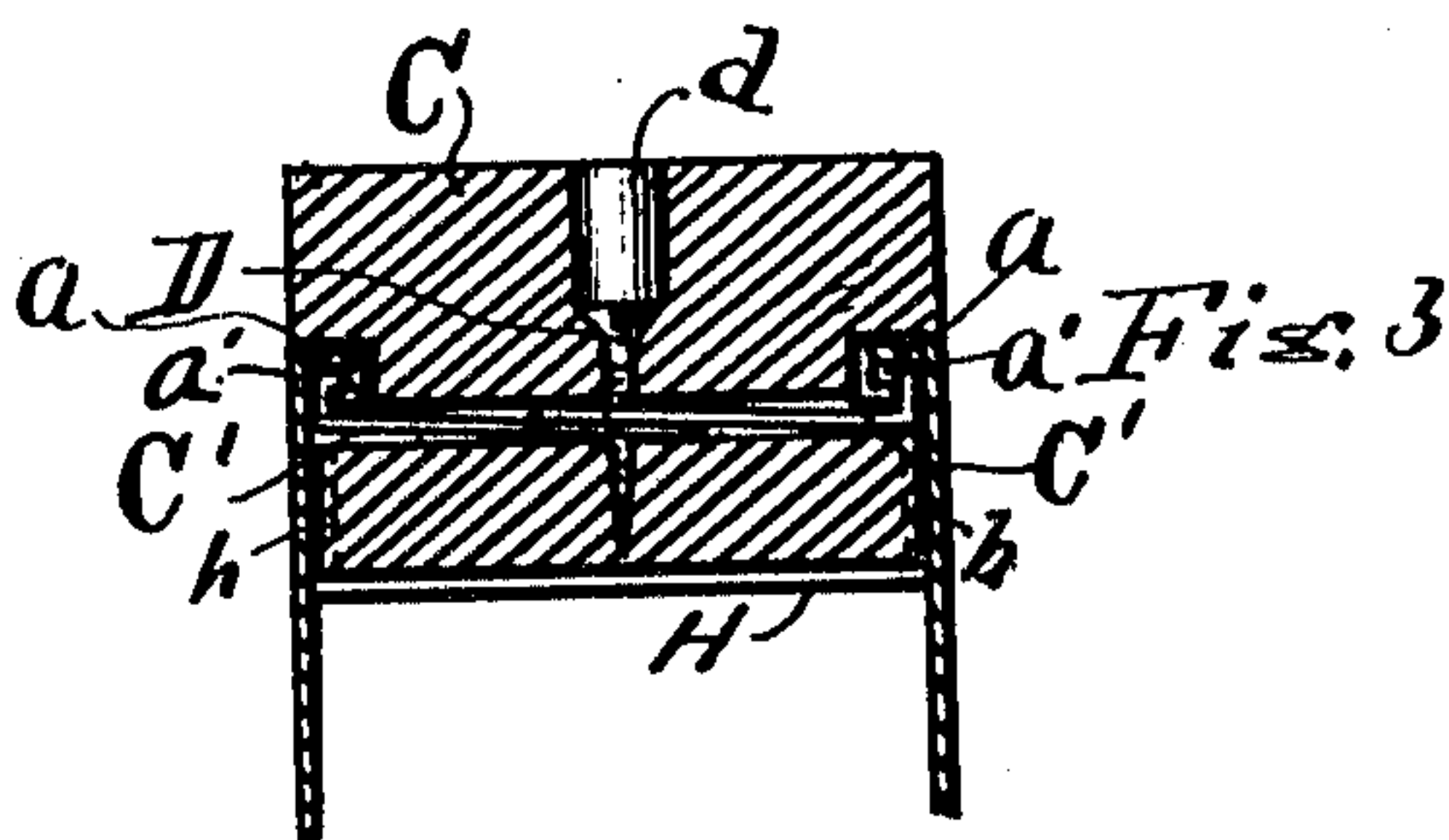


Fig. 3.

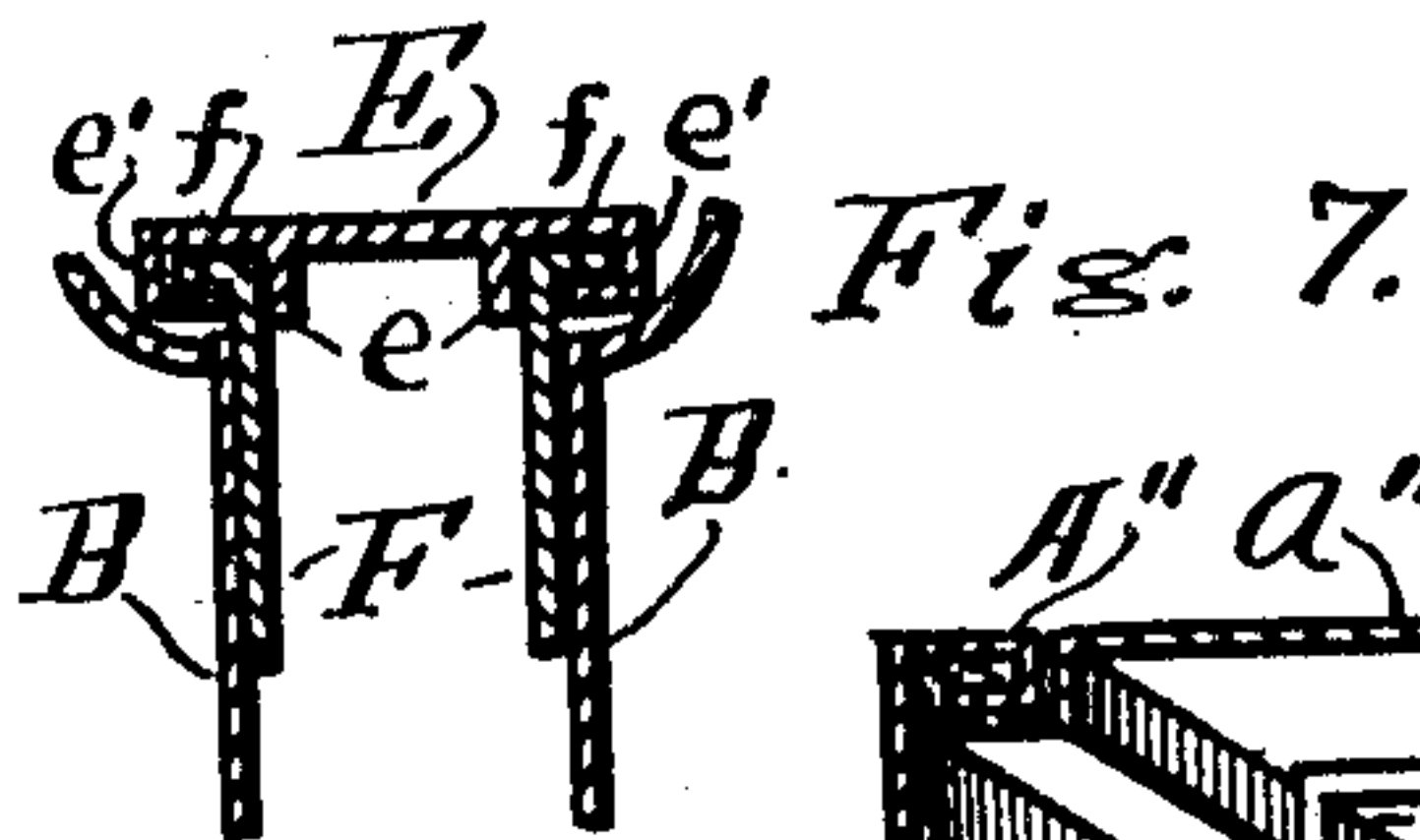


Fig. 7.

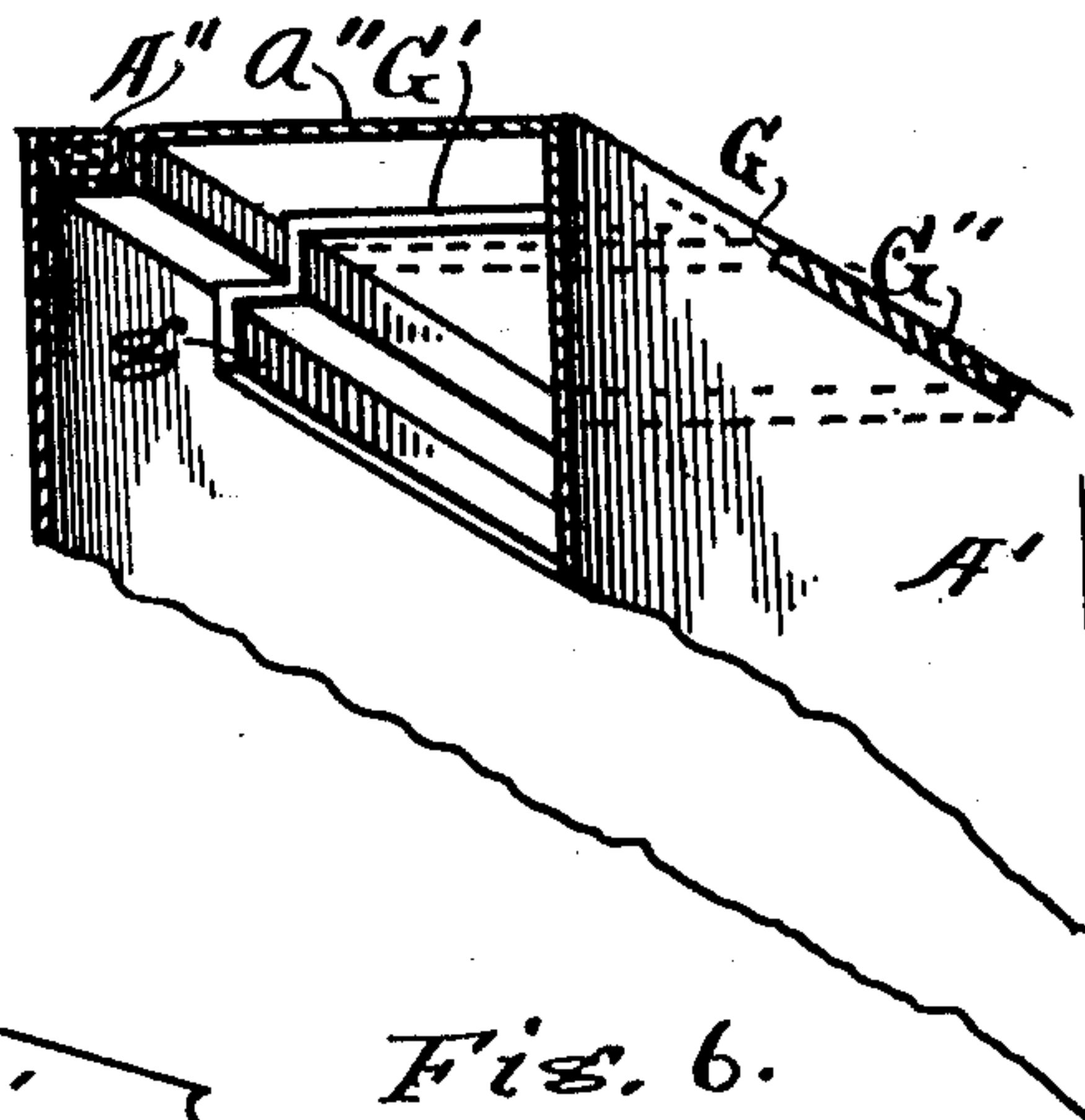


Fig. 6.

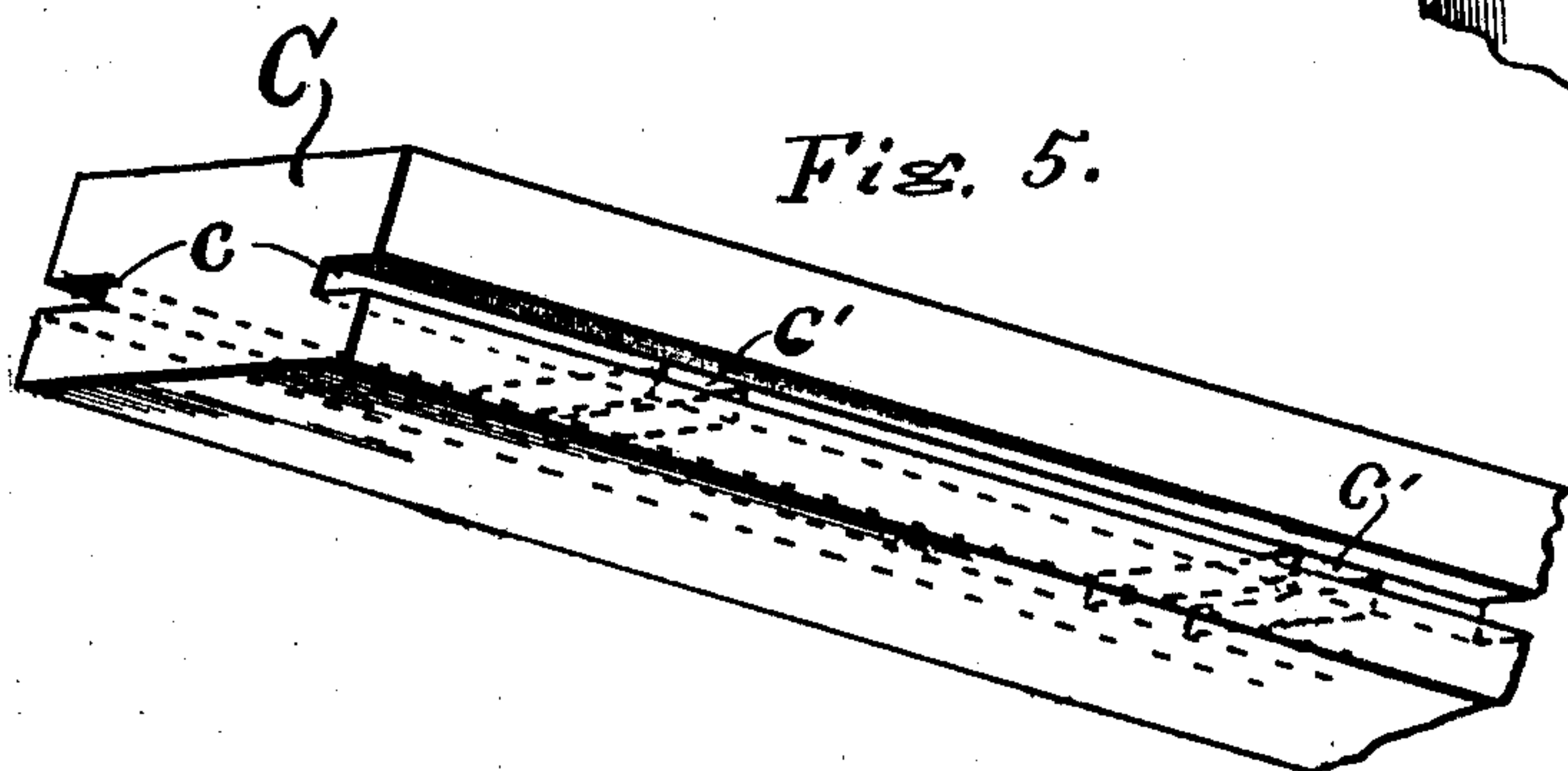


Fig. 5.

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ROBERT DIAMOND MAYO, OF GRAND RAPIDS, MICHIGAN.

METAL DOOR.

990,151.

Specification of Letters Patent.

Patented Apr. 18, 1911.

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To all whom it may concern:

Be it known that I, ROBERT D. MAYO, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Metal Doors, of which the following is a specification.

My invention relates to improvements in metal doors, and its objects are: first, to provide for conveniently attaching the hinges to the back stile of the door; second, to provide a convenient and substantial means of securing the two halves or sides of a metal door together, and, third, to provide a metal door that may be readily adjusted to slight variations in the form of the door frame. I attain these objects by the mechanism illustrated in the accompanying drawing in which—

Figure 1 is a section of a door stile and panel, shown in perspective, to indicate how the parts are secured together, and how the adjustable attachment is applied. Fig. 2 is a section of the adjustable part, shown in perspective, and showing a small mortise framed through at one side of the grooves. Fig. 3 is a sectional end view of a piece of a stile and the adjustable portion showing how the retaining clamps are applied. Fig. 4 is a perspective of the retaining clamp. Fig. 5 is a perspective of the wooden cleat showing the longitudinal grooves and the mortises framed the full width of the grooves. Fig. 6 is a section of the back or hinge stile of a door, shown in perspective to indicate the manner of securing the two sides together at one corner, and of applying the support for the hinge, and, Fig. 7, is an enlarged end view, in section, of the panel and the clamp that holds it to place.

Similar letters refer to similar parts throughout the several views.

A represents the door stile, and B represents the door panel, the two being made of an integral piece of metal.

F represents two securing lugs that are electrically welded to the two sides B that form the panel, and E represents a metal slide that is slid over the wings *f f* of the lugs and binds said lugs together. This slide has inner bearings lugs *e* that hold the panel, or lugs, out to place, and hooked wings *e'* that insure the proper placing of the slide E upon the lugs, and securing it from becoming disconnected from them.

Coming now to the adjustable portion, C, of the door, and the manner of attaching and securing it, the portion C is made of wood and is provided with a groove C, on each side designed to receive the retaining lugs or hooks *a a* that project inwardly from the edge of the sides of the stile. It will be readily understood that with this construction alone it would be impossible to properly secure the sides of the stiles to the adjusting portion C, and to facilitate this element in the construction of the door, I frame small mortises, as *c'*, through the wood C and provide two short sheets of metal, as *C'*, each having a hook *a'*, at one end, and a small hole, *d'*, through the other end, and so arranged that they may be passed into the mortises *c'* in the wood, as indicated in Fig. 3. When the clamps *C'* have been placed into the mortises, as herebefore stated, the hooks *a'*, on the edges of the stiles, are entered into the grooves *c c* at one end of the wooden portion C, and slid longitudinally thereof until all of the clamps, (there being several sets of then in the length of the stile), are made to engage the hooks *a*, when the sides of the stile are forced together sufficiently so that a screw D may be entered through the holes *d'* in the bodies of the hooks so that they will be, thereby, held firmly to place, thus securing the outer edges of the sides of the stiles firmly to the wooden portion of the finished stile. The screw D should be let into the wood C far enough so that there will be no possible danger of interfering with it when planing off, or narrowing down the wood to fit the door into a frame, as indicated at *d*. This wood extension is designed to be placed upon one edge, and one end of the door, and may be placed upon both ends, if desired, the manner of securing it at the ends being the same as that shown in Figs. 1 and 3.

In Fig. 1 the clamps *C'* are not shown, but they are shown in Fig. 3, lapping by each other and hooked or interlocked with the hooks *a*, practically in the position and condition they will be in a completed door.

It frequently happens that a door may be a trifle too wide or too long for the frame into which it is to be hung, or if properly fitted when hung, the building in which it is used may have settled and thrown the door frame out of square so that it may become difficult and even impossible to open or close the door. In such instances the difficulty

may be readily overcome by simply removing the door from its hinges and planing or shaving off a portion of the wood at the edge, top or bottom, until a perfect fit is secured. This could not, possibly, be accomplished with an all metal door, hence an, heretofore, insurmountable objection to all metal doors, which is easily overcome by this construction.

10 In Fig. 6 I have shown a portion of the back stile, or the stile of a door to which the hinges are secured for the purpose of hanging the door in a frame. In this construction, one side of the stile is made much wider than the other side and the surplus of metal is carried over, as at a'' , so that the connection between it and the other side of the stile is made, by double fold construction as shown at A'' , very close to the back, inner corner of the stile. This stile has portions cut away or stamped out, as at G , for the reception of the hinges, G'' , shown in section in this figure. For the purpose of insuring the firm attachment of the hinges to this stile, I place a metal patch, as $G'g$, inside of the stile back of the depression G , and electric weld it, or otherwise securely fasten it to place upon the edge and side of the stile, and over the folds at the corner of the stile, substantially as shown.

I do not desire to restrict myself to the special means hereinbefore set forth for securing the wooden edges to the edges of the stiles and rails, as other available ways may be used with success.

To insure the positively firm construction of the door I place a supporting cleat, as H , across between the two sides of the stile, just back of the wood portion C , with a wing, as h h , at each side that extends along the surfaces of said sides and are electrically welded thereto. When these supports are used the hooks or lugs a a on the edges of the sides of the stiles are used simply to receive and retain the clamping hooks C' — a' , but have no part in the holding of the sides together, as when the cleats H are not used. I greatly prefer the use of the cleats H as they insure a much stronger construction of the door, and in case a fire should destroy the wood portion these cleats would hold the stile firmly to place, while with the use of the clamps C' alone the destruction of the wood would allow the stile to warp and disfigure, if not destroy the stile. When the strengthening cleat H is used I prefer that each stile or rail be supported with thin channel iron that will extend the entire length of stile or rail, and said channel iron electric welded to the inner surfaces of the sides the entire length of the door.

Having thus described my invention, what

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

1. In combination with the sheet metal stiles, rails, and panels of a sheet metal door, hooks formed at the edges of the sides of the stiles, strips of wood having grooves to receive said hooks, and means for firmly securing the sides of the stiles to the wood by means of said hooks.

2. In combination with the stiles, rails and panels of a sheet metal door, hooks formed on the outer edges of the stiles or rails, a wooden cleat having grooves for the reception of said hooks, and mortises for the reception of clamps, sheet metal clamps passed into said mortises and made to engage the hooks on the edges of the stiles, and screws passed into the wood and through said clamps to secure the wood to the stiles and the clamps firmly in the wood.

3. In combination with the metal stiles, rails and panels of a metal door, lugs secured to the inner surface of the panels and having right angle hooks thereon, a slide provided with hooks and lugs to engage said first mentioned lugs, and a strip of wood secured to the edge and ends of the door, substantially as and for the purpose set forth.

4. In combination with the stiles, rails and panels of a sheet metal door, a wooden adjustment strip placed on the edges of the stile and rails, a channel iron brace welded to the inner surfaces of the sides of the stiles just back of the wood portion.

5. In combination with the stiles, rails and panels of a metal door, lugs welded to the inner surface of the panels and having backwardly turned hooks thereon, a slide having lugs to rest between the inner surfaces of the aforesaid lugs and hooks to engage the hooks on said lugs and hold said lugs and the sides of the door panels rigidly to place.

6. In combination with the stiles, rails and panels of a metal door, lugs welded to the inner surface of the panels, a slide made with hooks and lugs to engage said lugs that are secured to the panels, channel irons securely attached to the inner surfaces of the sides of the stiles, one of the stiles of a door having offsets for the reception of hinges, and interlocked near one side of the edge of the stile, and a supporting piece welded to the edge and sides of the stile back of the offsets.

Signed at Grand Rapids Michigan November 16, 1910.

ROBERT DIAMOND MAYO.

In presence of—

I. J. CILLEY,
LOUIS CILLEY.