

No. 698,785.

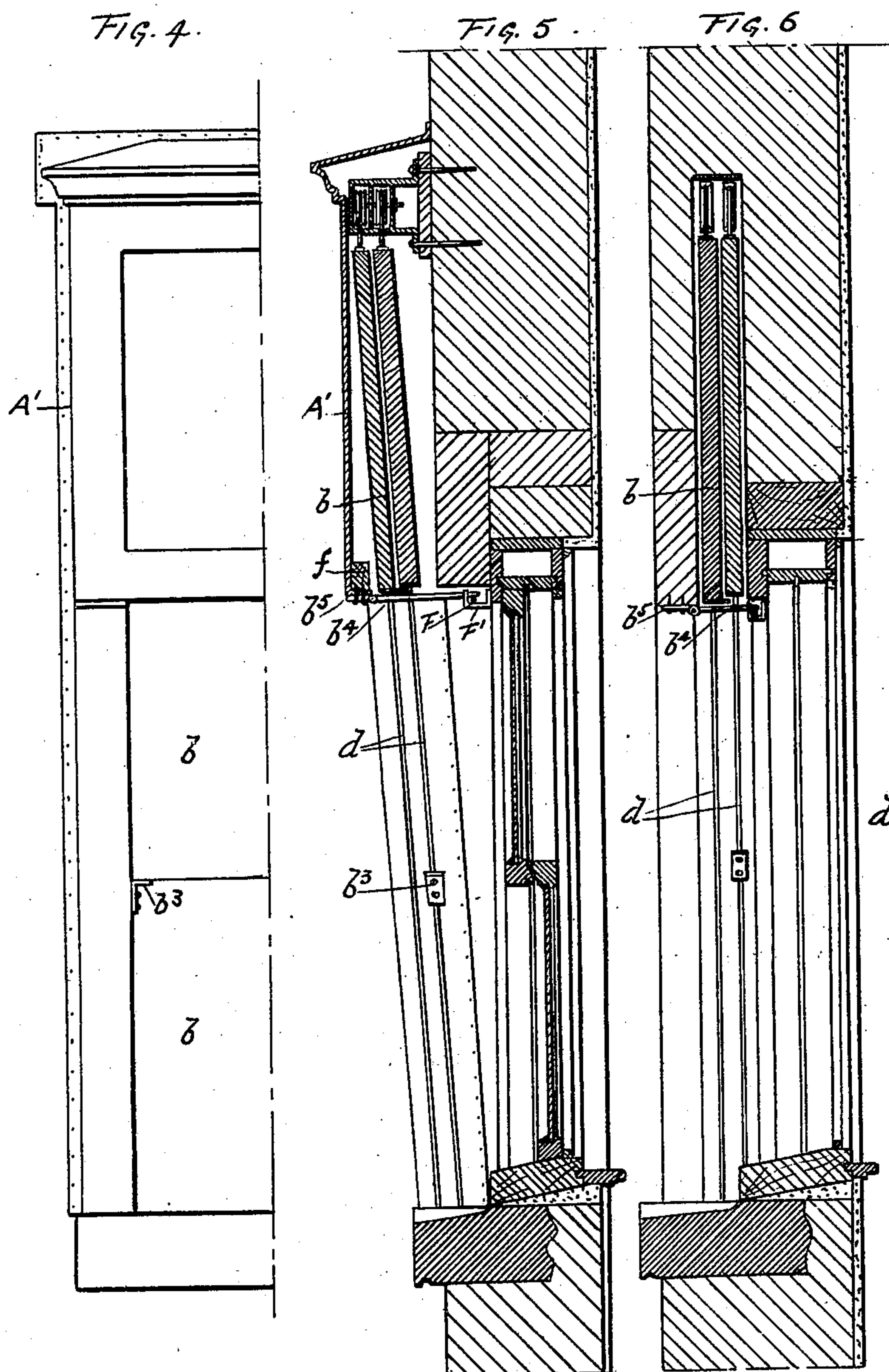
Patented Apr. 29, 1902.

C. A. BARBER.
AUTOMATIC FIREPROOF DOOR, &c.

(Application filed June 29, 1901.)

(No Model.)

3 Sheets—Sheet 2.



Witnesses.

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3 Sheets—Sheet 3.

Fig. 7.

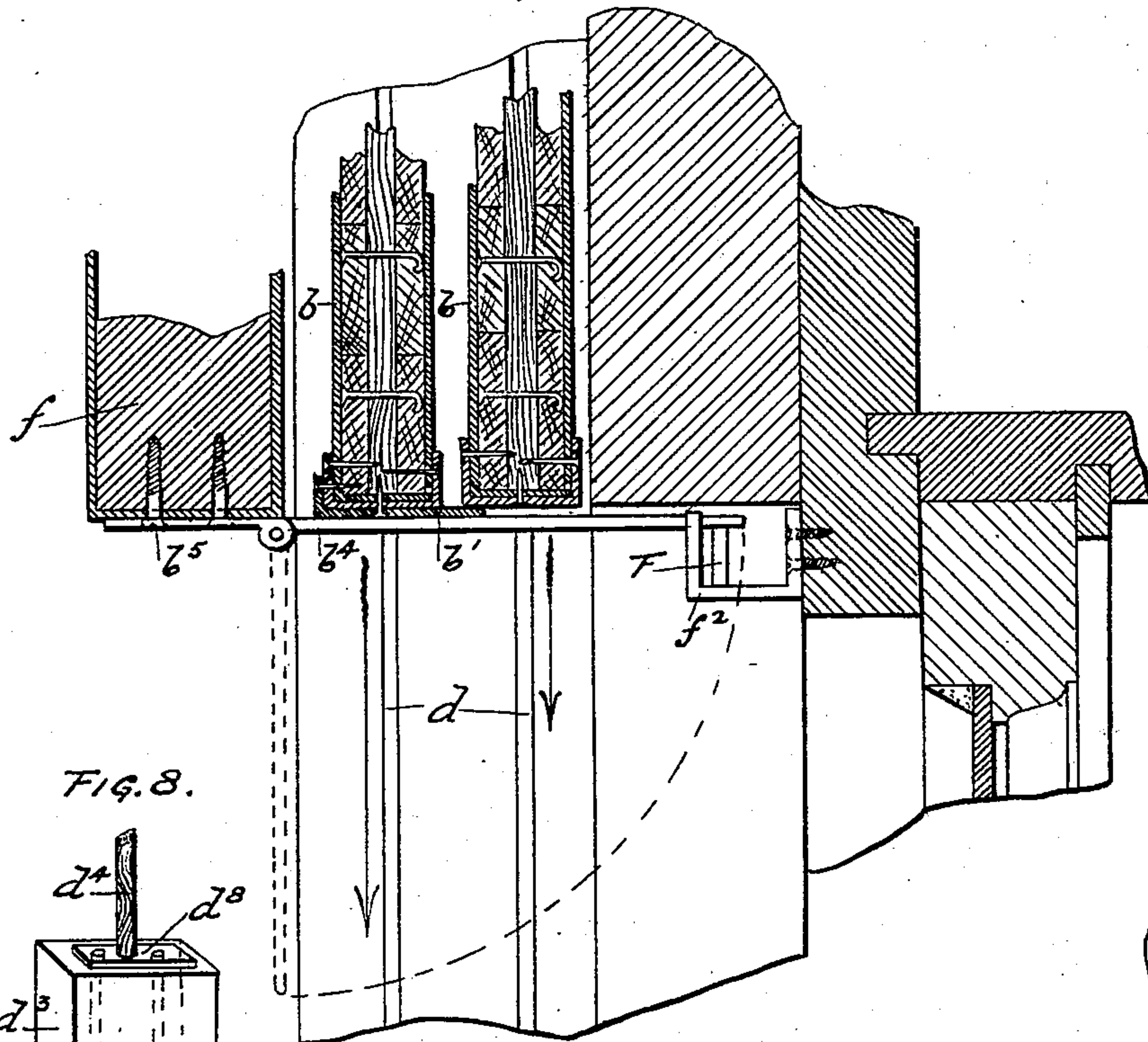


Fig. 8.

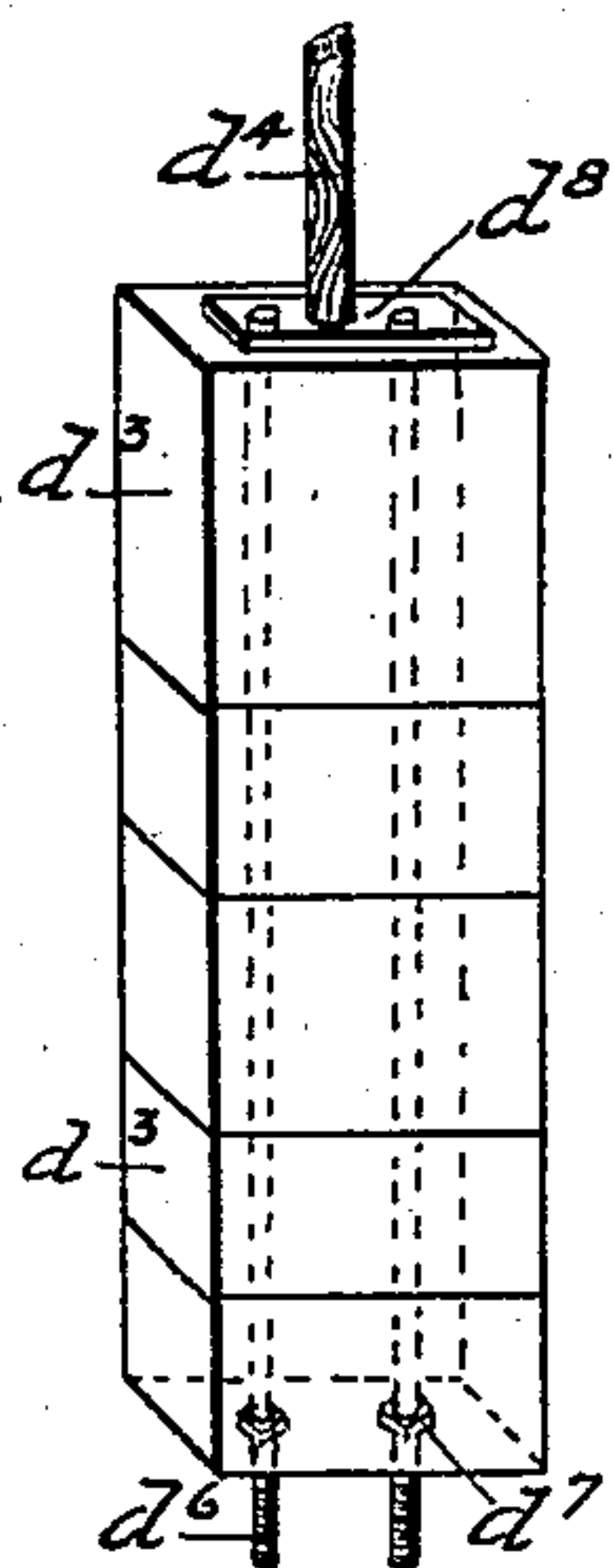


FIG. 9

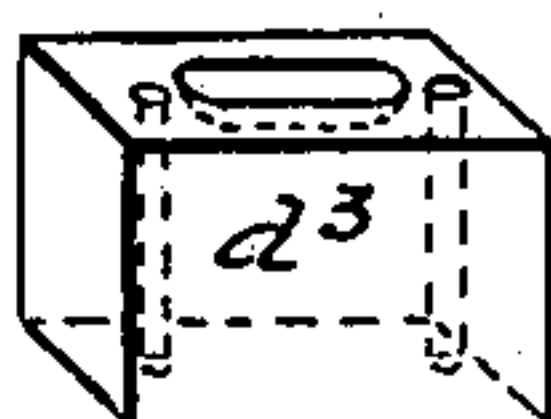
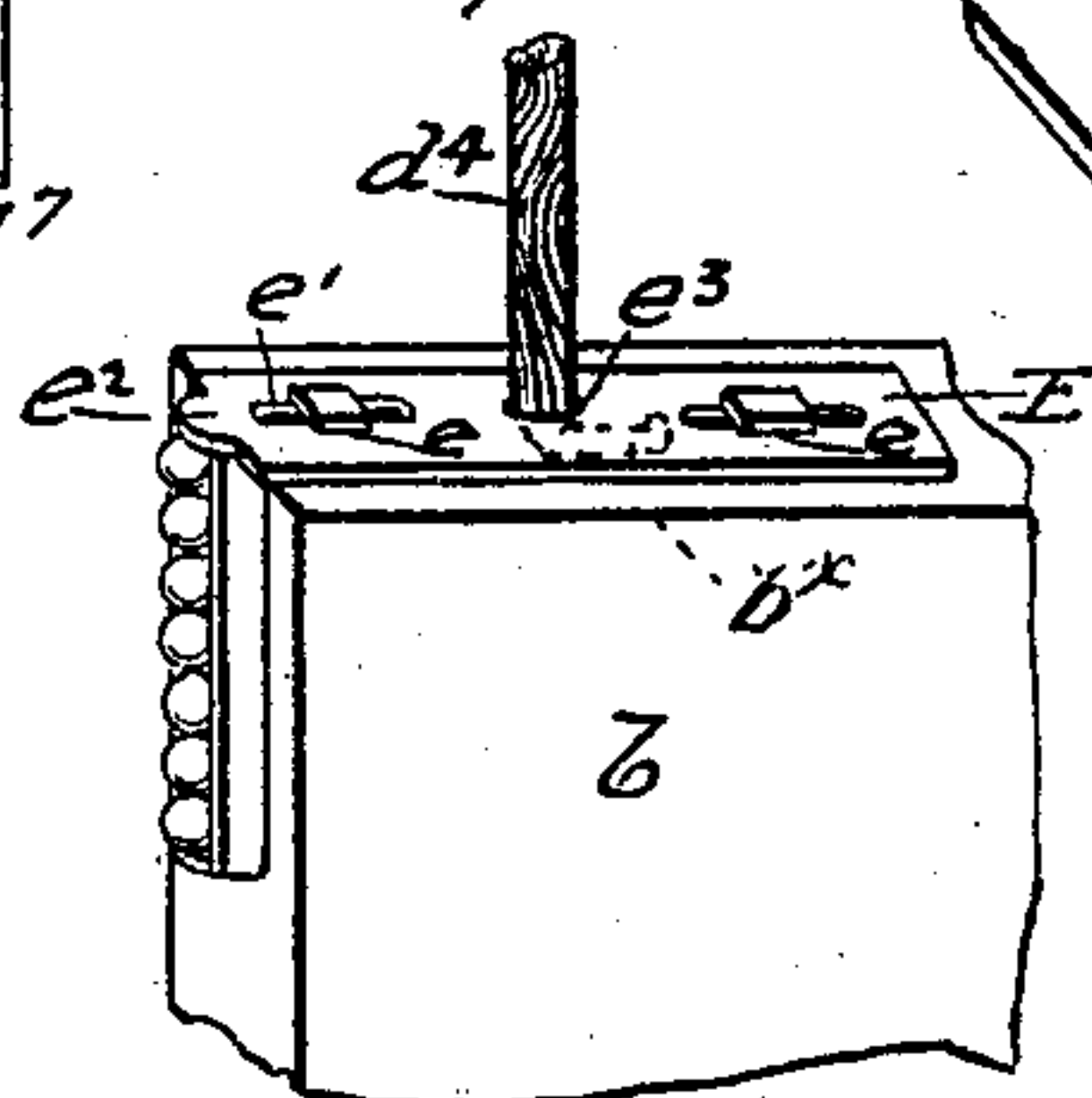
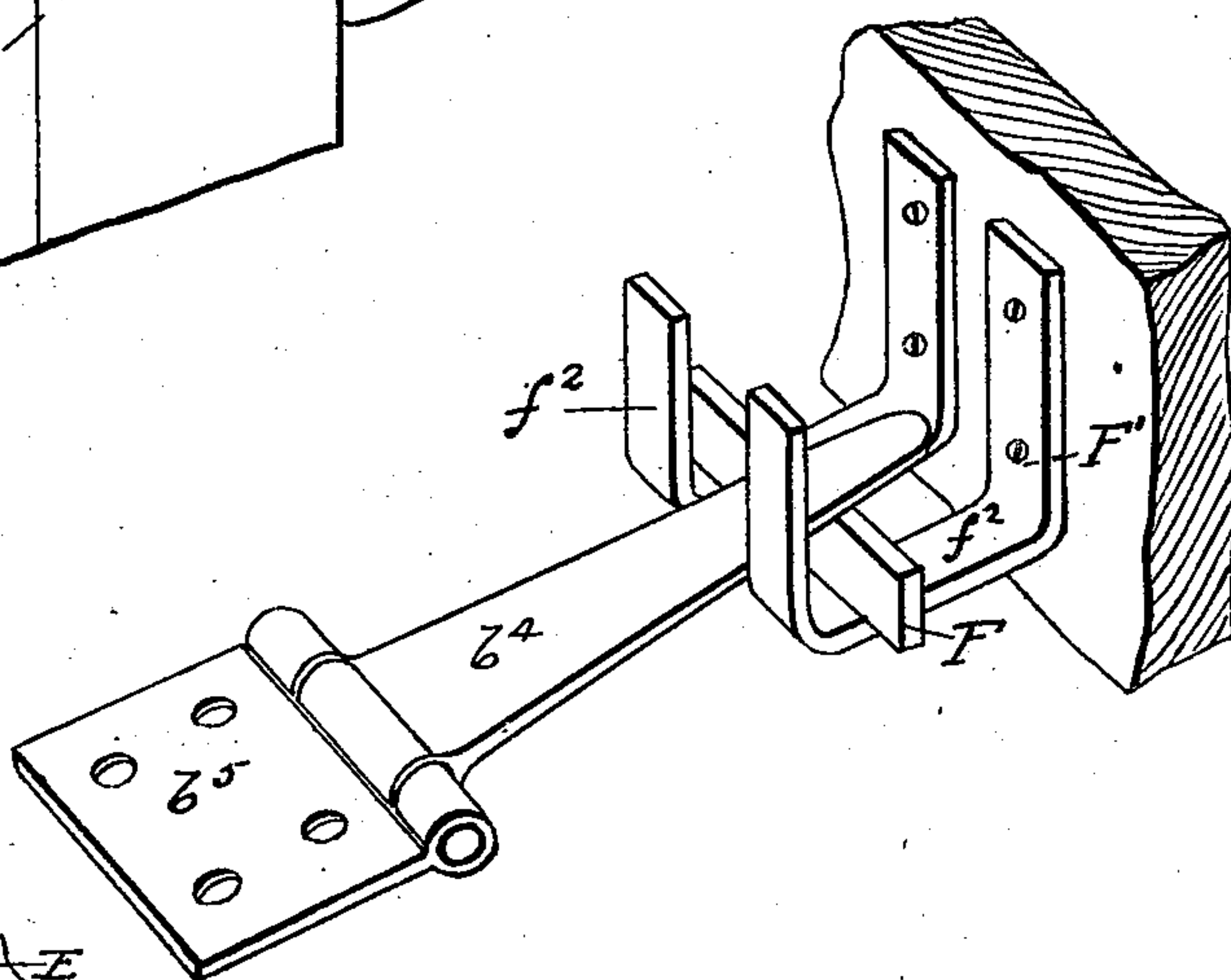
FIG. 10^u

FIG. II.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIREPROOF DOOR, &c.

SPECIFICATION forming part of Letters Patent No. 698,785, dated April 29, 1902.

Application filed June 29, 1901. Serial No. 66,560. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ARNOLD BARBER, a subject of the King of Great Britain, residing at Montreal, in the Province of Quebec, Canada, have invented certain new and useful Improvements in Automatic Fireproof Doors, &c., of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to automatic or self-closing fireproof doors, shutters, &c.; and its object is to provide a fireproof door or similar device which shall be automatic in its action, instantaneous and certain in its operation, and which can be manufactured at a comparatively low cost.

To these ends the invention consists of an automatic fireproof closing device constructed substantially as hereinafter illustrated and described, and defined in the appended claims.

Referring to the drawings, in which similar letters of reference indicate similar parts, Figure 1 is a view in front elevation showing the half of a fireproof door constructed in accordance with the invention, parts being in section to show the construction. Fig. 2 is a vertical section thereof. Fig. 3 is a transverse section of a portion of the door-frame, showing details of construction. Fig. 4 is a front elevation of a portion of a window to which this invention has been applied. Fig. 5 is a vertical section thereof. Fig. 6 is a vertical section of a modified form of this invention. Fig. 7 is a sectional view of the mechanism for sustaining the shutters in their elevated or normal position, showing in dotted lines the mode of operation. Figs. 8, 9, 10, and 11 are views in perspective of details of the invention.

Referring particularly to Figs. 1, 2, and 3 of the drawings, A represents an ordinary wall or partition of a building through which is formed a doorway of any ordinary or preferred construction. Above the said doorway is provided a space *a*, within which the sections *b* of the door B are housed and concealed from view while in their normal position. Fitted within the sides of the jambs *a'* of the doorway and extending upwardly to the top of the space *a* is a metal frame or box

D, which is provided upon its outer face with a series of vertical grooves or guideways *d*, arranged parallel to one another and constructed preferably in two sets, one of said sets of grooves being located on the front side of the frame D and the other set on the rear side thereof, as is clearly shown in Fig. 3. Back of the grooved face of the frame D is a space which is divided by vertical partitions *d'* into a series of channels *d''*, which are adapted to receive the weights *d'''*, by which the sections *b* of the door B are counterbalanced. These channels being separated from one another throughout their entire length serve as independent guides for the said weights and prevent them from becoming entangled with each other. The ropes *d''''*, attached to said weights, pass over suitable grooved pulleys *d'''''*, journaled in the upper portion of the frame D, and are connected at their other ends to their respective sections *b*, as will be readily understood.

In the construction shown in Figs. 1, 2, and 3 it will be noted by referring particularly to Fig. 2 that there are two sets of door-sections *b* and that the upper section of each set occupies the outer groove of the two corresponding sets of grooves *d*, the remaining sections *b* occupying the succeeding inner grooves. By means of this arrangement when the door-sections *b* have fallen or are in their lowered position there will be in reality two separate doors inclosing an air-space between them, which air-space is practically hermetically sealed by reason of the tight fitting of the door-sections. This air-space aids materially in rendering the construction fireproof and renders it practically impossible for a dangerous degree of heat to penetrate from one side of the door to the other, a common defect in ordinary fireproof structures.

The upper and preferably the lower edge of each door-section *b* is provided with a plate E, which is movably secured thereon by means of the set-screws *e*, which pass through the elongated slots *e'*, whereby the said plates are adapted to be adjusted with respect to said door-section. The inner end of the plate E is provided with a lug or projection *e''*, which is adapted to engage and slide in one of the grooves *d* of the frame D, so as to guide the door-section *b* in its movement. By reason

of the adjustability of the plate E a close perfect fit can always be maintained between the door-sections b and the grooves d of the frame D, thus compensating for shrinkage, insuring easy and smooth movement of the said sections, and absolutely obviating all tendency to stick and bind. The lug or projection e^2 is preferably formed hollow, and one or more friction-balls are arranged therein, whereby any tendency to stick or bind will be obviated.

The upper edge of the section b is provided with a shallow groove b^x , within which is placed the end of the weight-ropes d^4 , which are preferably of wire, which ropes pass through a hole e^3 , formed in the said plate E. When the plate E is fastened in place by means of the screw-bolts e , the rope d^4 is securely clamped in position. By means of this construction when it is desired to attach the rope to the section or to adjust the length of the rope it is only necessary to loosen the plate E, as will be readily understood.

The weights d^3 are preferably constructed of a number of independent sections varying in size and weight, the bottom ones being the smaller, so as to permit of an accurate counterbalance. Each of the sections d^3 is provided with two perforations, through which pass the rods d^6 , having a head on the upper end and screw-threads upon the lower end, upon which is adapted to be threaded the adjusting-nut d^7 . A plate d^8 is arranged upon the upper weight d^3 and is provided with perforations at each end, through which pass the rods d^6 . A central perforation is also provided in said plate for the passage of the rope d^4 , and a groove is formed in the upper face of the upper weight-section, within which the end of the rope d^4 is clamped, as for the purpose above explained in connection with the door-section. When the weight connected with any door-section requires to be varied, it is only necessary to remove the lower weight-section and replace it with a lighter one or one or more heavier ones, as required.

The lower edge of each inner door-section is provided with a plate b' , which is constructed with an extension which projects beneath the lower edge of the adjacent door-section, (see Fig. 2,) while the innermost door-section is also provided with a bolt b^2 , which is adapted to rest upon the fuse F, inserted in the keeper f , secured upon the head-beam f' . It will thus be seen that each door-section is supported by the adjacent section and the last door-section is supported by the bolt and fuse. It is therefore obvious that when the fuse melts or is removed the door-sections will at once descend.

At suitable points in the pathway of each of the outer sections is fixed a suitable stop b^3 , which limits the downward movement of the sections, the last section, however, coming to rest upon the door-sill. By reason of the accurate counterbalancing of the door-sections their descent, while instantaneous,

will be so gentle as to preclude the possibility of injury to any one caught thereunder.

In the modifications shown in Figs. 4, 5, 6, and 7 the invention is shown as particularly adapted to shutters for closing a window, though it is obvious that either or any of the forms shown can be utilized to close any opening. In Figs. 4 and 5 the invention is shown in the form adapted to be applied to the windows of a building already built. In this form a metal frame A' is provided with the guideways, &c., above described and is securely fastened by bolts or otherwise about the window, forming an auxiliary window-frame, which may be of any desired style and ornamented to suit individual taste. In Fig. 6 the form shown is that designed to be applied to a building in the course of erection. In this form the space containing the guideways, &c., is formed in the wall of the building, as in the form shown in Figs. 1 and 2, and hence requires no separate frame, as in Fig. 5, and is not visible when the building is completed. In all these forms the air-space is provided for by the window-sash, as is clearly shown in Fig. 5.

Instead of having a rigid bolt, Figs. 1 and 2, in many instances, especially in connection with windows, it is preferable to use a hinged lever b^4 . (Best shown in Figs. 7 and 11.) This hinged lever is constructed, preferably, of a plate b^5 , having perforations, by means of which it may be screwed to the frame or any suitable part of the window-frame. To the plate b^5 is hingedly connected the lever b^4 in such a manner as to be incapable of upward movement beyond the horizontal plane, but which swings freely downwardly. To a suitable portion of the window-frame is secured a bracket F' , which preferably consists of two spaced angle-irons f , having their outer ends upturned. The fuse F is placed upon the arms of the bracket, and the lever b^4 rests thereon between the upturned ends of the said arms, as clearly shown in Fig. 11.

It is not essential nor desirable to describe particularly the construction or composition of the fuse F, as this invention will be protected in a separate patent, for which application will be made hereafter. It is sufficient, however, for the purposes of this specification to state that the fuse must be capable of melting at a comparatively low temperature and should also be capable of flashing instantly upon contact with flame. The dimensions and form of the fuse will be such as the necessities of the particular construction require.

It will of course be understood that the frame, door, and shutter sections and all exposed portions of the construction herein described will be of fireproof wood or incased in metal, or both.

It is to be expressly understood that this invention is not limited to the exact details of construction herein illustrated and described, the particular form and construction

herein disclosed being intended merely as a simple and convenient embodiment of the principles of the invention for the purposes of description, and they may be varied to suit the requirements of any special case.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In an automatic fireproof door, &c., the combination with a frame having two independent sets of guide-grooves, of a plurality of door-sections slidably mounted in each of said sets of guide-grooves, a plate mounted upon the lower edge of each of the inner door-sections, each of said plates overlapping the lower edge of the adjacent outer door-section, a locking-bolt secured to each of the innermost door-sections and projecting inwardly therefrom, a bracket mounted upon a suitable portion of the framework and adapted to receive each of the said locking-bolts, and a fuse mounted in said bracket and adapted to retain the locking-bolts in their normal position, substantially as shown and described.

2. In an automatic fireproof closing device, the combination with a frame, shutter-sections slidably mounted in said frame, a fusible plug, and a hinged lever having its end supported by said fusible plug and adapted to retain the said shutter-sections in their raised position, whereby the fusing of the said plug will release said shutter-sections, substantially as shown and described.

3. In an automatic fireproof closing device the combination with a window frame and sashes, of an auxiliary frame applied to said window-frame, shutter-sections slidably mounted in said auxiliary frame, a fusible plug, and a hinged lever having its end supported by said fusible plug and adapted to retain the said shutter-sections in their raised

position, whereby the fusing of the said plug will release said shutter-sections and form a dead-air chamber between said shutter-sections and said window-sashes, substantially as shown and described.

4. In an automatic fireproof closing device, the combination with a frame provided with suitable guide-grooves, shutter-sections slidably mounted in said frame, a plate adjustably mounted upon each of said shutter-sections, and a projecting lug integral with said plate and adapted to engage and slide in said guide-grooves, substantially as shown and described.

5. In an automatic fireproof closing device, the combination with a frame provided with suitable guide-grooves, shutter-sections slidably mounted in said frame, a plate adjustably mounted upon each of said sections, a projecting hollow lug integral with said plate and adapted to engage and slide in said guide-grooves, and friction-rollers mounted in said lug, substantially as shown and described.

6. In an automatic fireproof closing device, the combination with a frame, of a shutter-section slidably mounted in said frame, having a groove in its upper edge, a perforated plate removably clamped upon the upper edge of said shutter-section and over said groove, a wire rope having its lower end passed through the perforation in said plate and clamped within said groove, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 22d day of June, 1901.

CHARLES A. BARBER.

Witnesses:

WILLIAM B. ROBERTS,
YVONNE CASTONGUAY.