(No Model.) 2 Sheets—Sheet 1.

R. P. MANLY.

FIRE PROOF SHUTTER.

No. 281,198. Patented July 10, 1883.

FIG. 1.

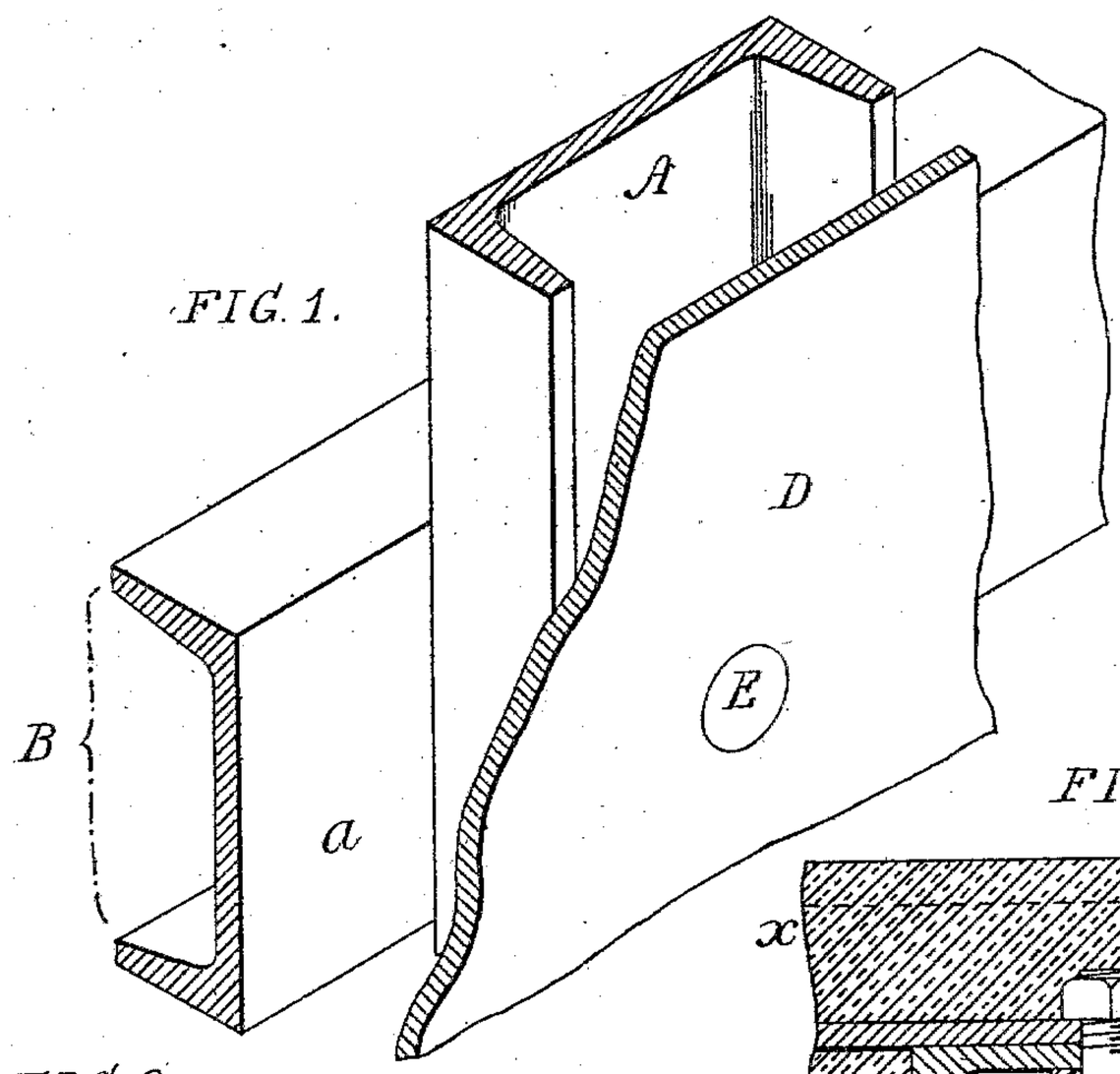


FIG. 2

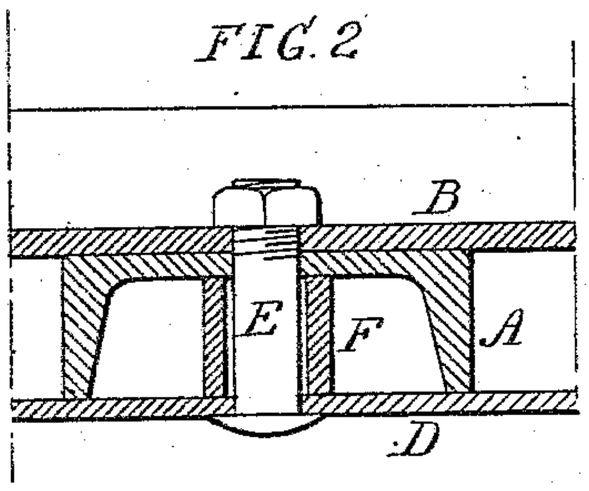


FIG. 3.

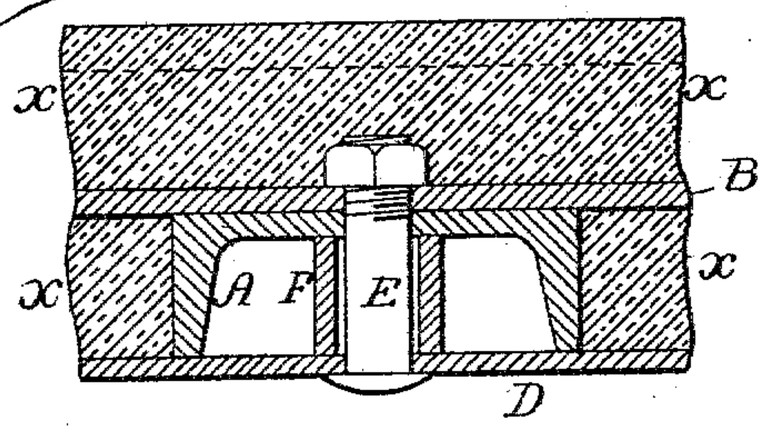
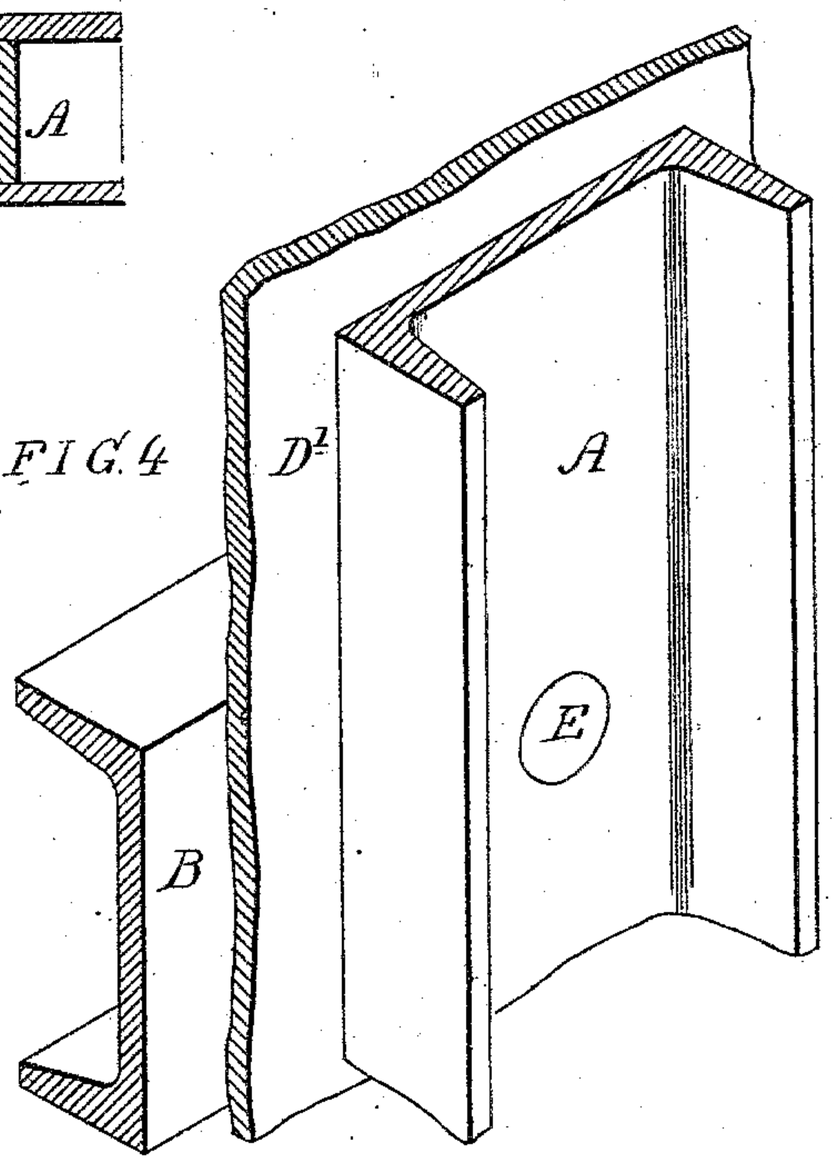


FIG. 4



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(No Model.)

2 Sheets—Sheet 2.

R. P. MANLY.

FIRE PROOF SHUTTER.

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FIG. 5.

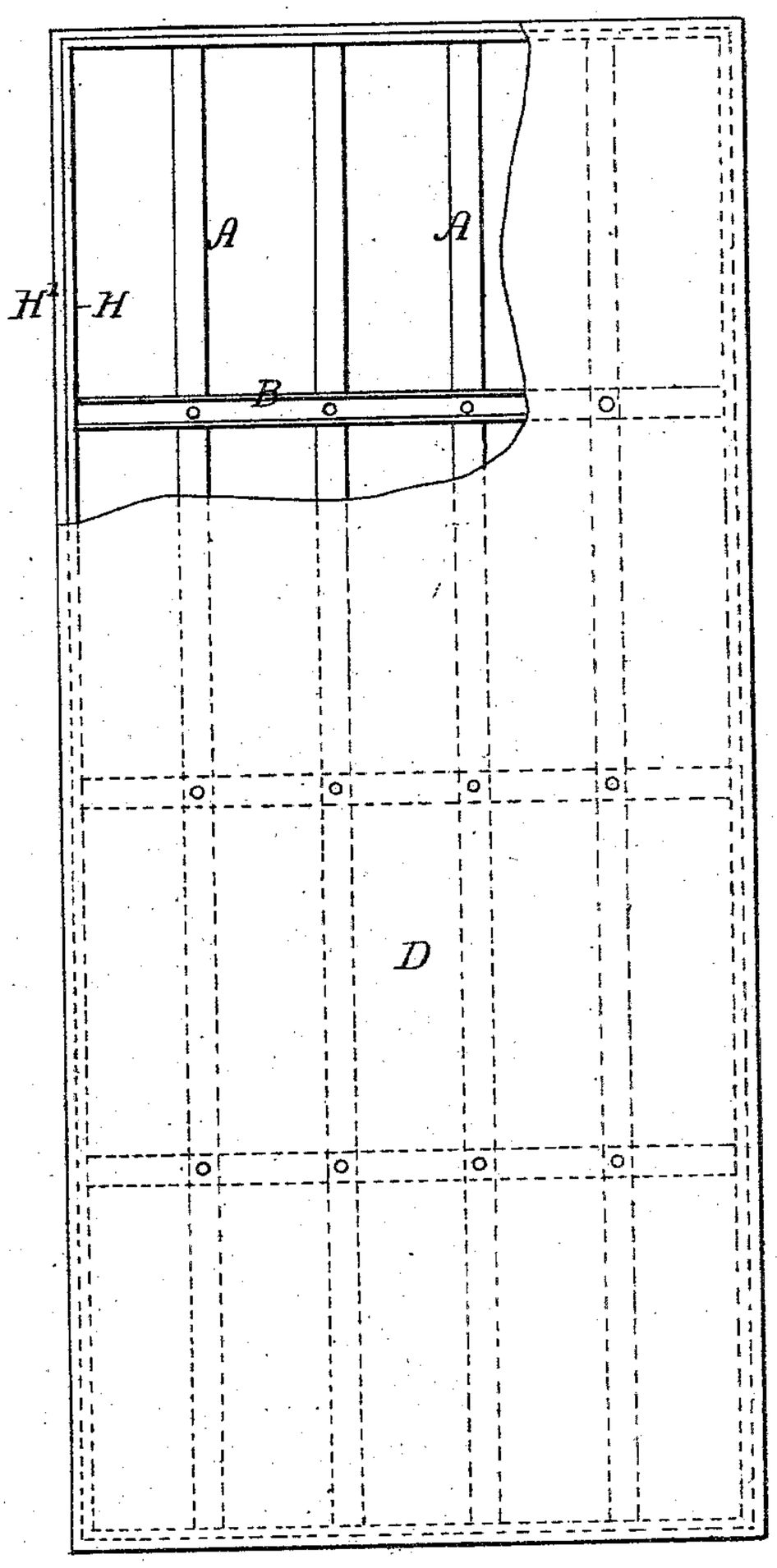


FIG. 8.

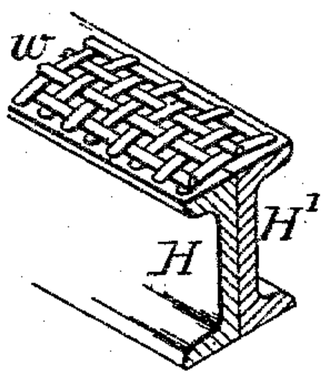


FIG. 7.

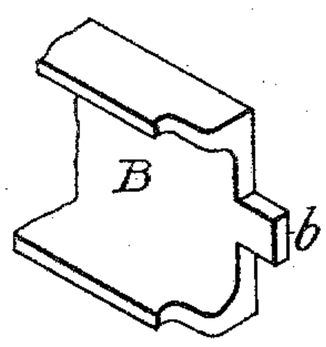
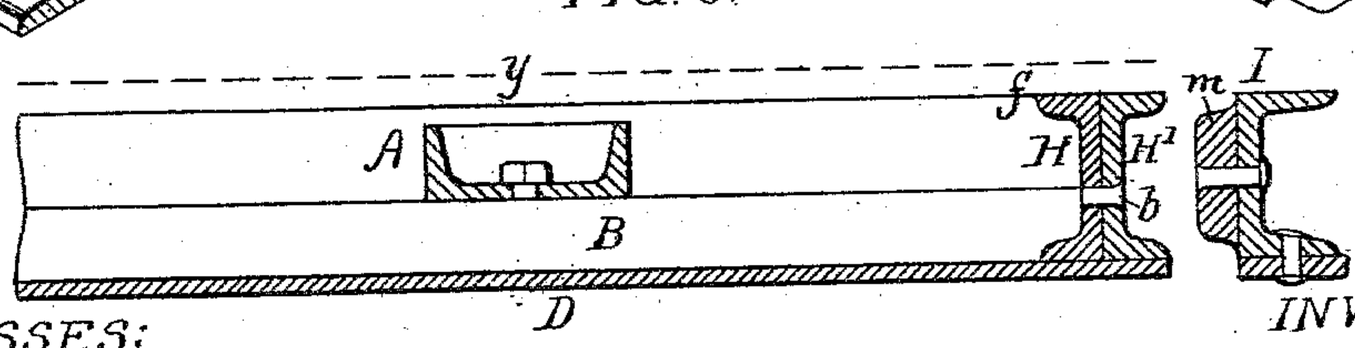


FIG. 6.



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UNITED STATES PATENT OFFICE.

ROBERT P. MANLY, OF PHILADELPHIA, PA., ASSIGNOR OF ONE-HALF TO THE MANLY & COOPER MANUFACTURING COMPANY, OF SAME PLACE.

FIRE-PROOF SHUTTER.

SPECIFICATION forming part of Letters Patent No. 281,198, dated July 10, 1883.

Application filed January 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROBERT P. MANLY, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Fire-Proof Doors, Shutters, &c., of which the following is a specification.

My invention relates to the construction of fire-proof doors, shutters, &c., of wrought-iron; and my invention consists, mainly, of the peculiar combination, described hereinafter, of channel-bars with a plate or plates, whereby strong and rigid, but comparatively light, frames are produced.

My invention also consists of other features of construction, too fully explained hereinafter to need preliminary description.

In the accompanying drawings, Figure 1, Sheet 1, is a perspective view (full size) of part of a fire-proof door, shutter, or partition made according to my invention; Fig. 2, a sectional plan of Fig. 1; Fig. 3, the same as Fig. 2, showing a backing of refractory or non-conducting material combined with the frame; Fig. 4, a modification of Fig. 1; Fig. 5, Sheet 2, a view, drawn to a reduced scale, of a door made according to my invention, part of the cover-plate being removed to show the channel-iron ribs; Fig. 6, a sectional view (half size) of the door and part of an adjoining door, and Figs. 7 and 8 detached views illustrating my invention.

It will be well, in the first instance, to refer to the diagrams in Sheet 1, which represent the main feature of my invention.

In the sectional perspective view, Fig. 1, A is one of a series of vertical channel-bars; B, one of a series of similar but transverse bars, and D a cover-plate of sheet-iron. The bars, it will be observed, are arranged back to back—that is to say, the flat back *a* of each of the series of transverse bars is placed against the flat backs of the vertical bars; and the bars, where they cross each other, are connected together and to the plate D by a bolt or rivet, E, the stem of which passes through the plate, through the flat backs of both channel-bars, and through a stay or ferrule, F, interposed between the vertical bar and the plate, as shown in the sectional view, Fig. 2. There may be two plates, one on each side of the channel-bar frame; but in most cases the structure will be adopted in the manufacture of fire-proof doors, shutters, and partitions, the backing of which consists of plaster-of-paris, cement, or other non-conducting or refractory material, in which case the frame is well adapted for the secure retention of the material, as will be seen by reference to the sectional view, Fig. 3, in which *x* represents the non-conducting or refractory material, which has been lodged, while in a plastic state, in the recesses formed by the ribs of the frames, and behind the transverse channel-bars B, which thus retain in place the material after it becomes dry and hard. Where a simple iron door has to be made, without any regard to neatness of finish and without any non-conducting material, there may be a combination of crossed channel-bars placed back to back, with a plate, D′, interposed between the backs of the two sets of bars, as shown in Fig. 4. In wrought-iron channel-bars the distribution of metal is such that although the said bars are light they have great transverse strength, and can be made cheaply; hence they are well adapted to the construction of comparatively light fire-proof doors, shutters, &c. When subjected to heat, however, they have a tendency to warp in one direction, and this is one of the objects of securing them together back to back, for the tendency of one set of bars to warp in one direction will be counteracted by the tendency of the other set to warp in the contrary direction; but the main object is to make the most rigid and substantial structure with the least amount of metal.

Fig. 5, Sheet 2, shows an entire door composed of vertical and transverse bars of channel-iron combined with a cover-plate of sheet-iron.

In the construction of sliding doors I prefer to make all four edges of two channel-bars, H H′, riveted or bolted together back to back, as shown in Fig. 6, so that an internal flange, *f*, may be presented for the retention of non-conducting or refractory material; but when this is not used as a part of the door a single channel-iron may be used. At each corner of the door, where two edges meet and are fitted to each other, I rivet to each edge any

suitable corner-piece of wrought-iron. The manner of securing the channel-bars to the edges of the door is illustrated in Figs. 6 and 7, each end of the bar B being so cut away as to present a tenon, *b*, which is passed through the channel-iron edge of the door and riveted or clinched. Where there are two sliding doors arranged to meet, I use for one edge of one of the doors a single channel-iron bar, I, Fig. 6, and rivet to the same a strip, *m*, adapted to the recess formed by the channel-iron edge of the adjoining door, so that when the doors meet there will be a comparatively tight joint.

Wrought-iron partitions may be made in the same manner as the doors, and when a sliding door is used in connection with such a partition, the edge of the latter, against which the door has to be closed, may have a strip, *m*, adapted to the edge of the door. When the door is backed with non-conducting or refractory material, the latter is preferably so thick as to entirely cover the wrought-iron frame. The extent of the material beyond the frame is shown in the full-sized sectional view, Fig. 3, and is indicated by the dotted line *y* in Fig. 6. In order that the material may be retained on the door where it crosses the edges, I secure to the back of the frame, at and near all four edges of the door, wire-gauze or wire-netting *w*, through the meshes of which the material, when in a plastic state, can penetrate. This will be understood by referring to Fig. 8.

In constructing hinged doors or shutters, each edge of the door is composed, preferably, of a single channel-bar, the flanges of which project inward.

I claim as my invention—

1. A wrought-iron door, shutter, or partition, in the frame of which two sets of channel-bars placed back to back and crossing each other are combined with a plate or plates secured to the said bars, all substantially as set forth.

2. The combination, in a fire-proof door or partition, of a frame composed of two sets of channel-bars placed back to back, and a plate secured to said bars, with a backing, *x*, of non-conducting or refractory material.

3. The combination of the vertical and transverse channel-bars, placed back to back, with edging channel-bars H H′ and plate D.

4. In sliding doors or shutters arranged to fit together and to be moved apart, the combination of the channel-iron edge of one door with the channel-iron edge of the adjoining door, having a strip, *m*, substantially as described.

5. The combination of the channel-bar frame, cover-plate, and channel-bar edges with wire-gauze *w*, attached to the edge bars, substantially as set forth.

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

ROBT. P. MANLY.

Witnesses:
CHARLES W. SPARHAWK,
HUBERT HOWSON.