H. L. FISH.

FIREPROOF SHUTTER, CURTAIN, &c.

APPLICATION FILED OCT. 10, 1908.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

916,288.

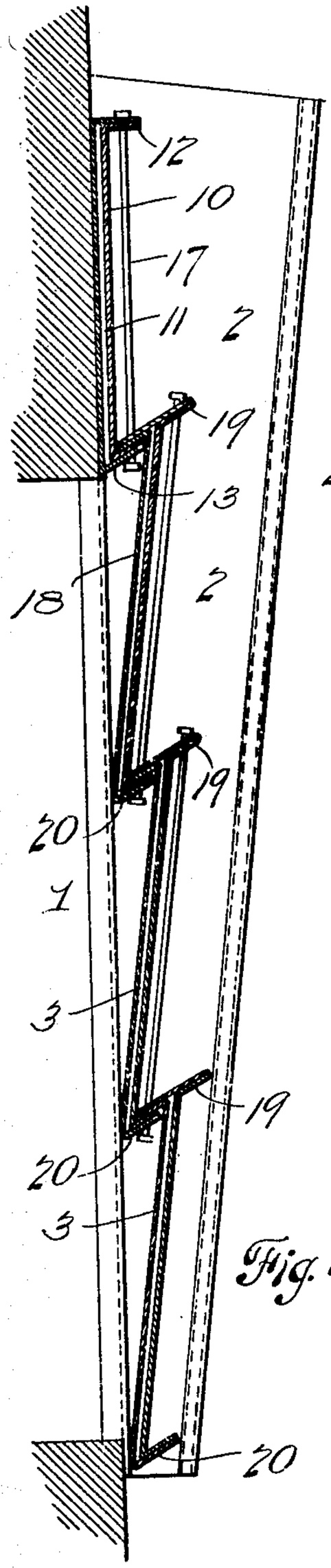
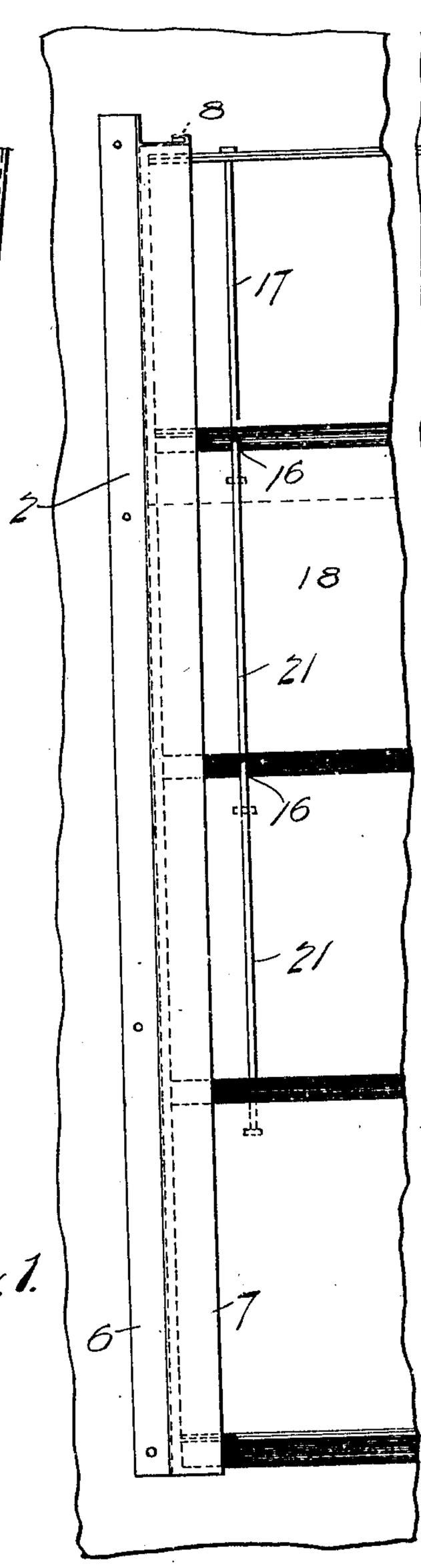


Fig. 1.



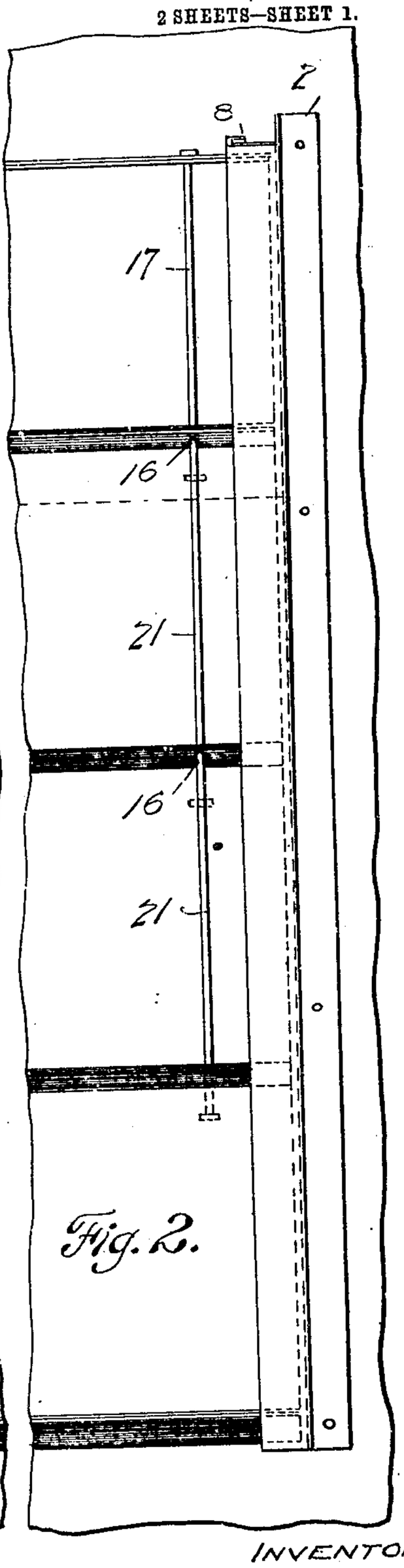


Fig. 2.

WITNESSES

H. N. Jenkins

J. R. Nottingham

INVENTOR.

Henry L. Fish

BY

Henry S. Blackmore

ATT'Y

H. L. FISH.

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916,288.

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2 SHEETS—SHEET 2.

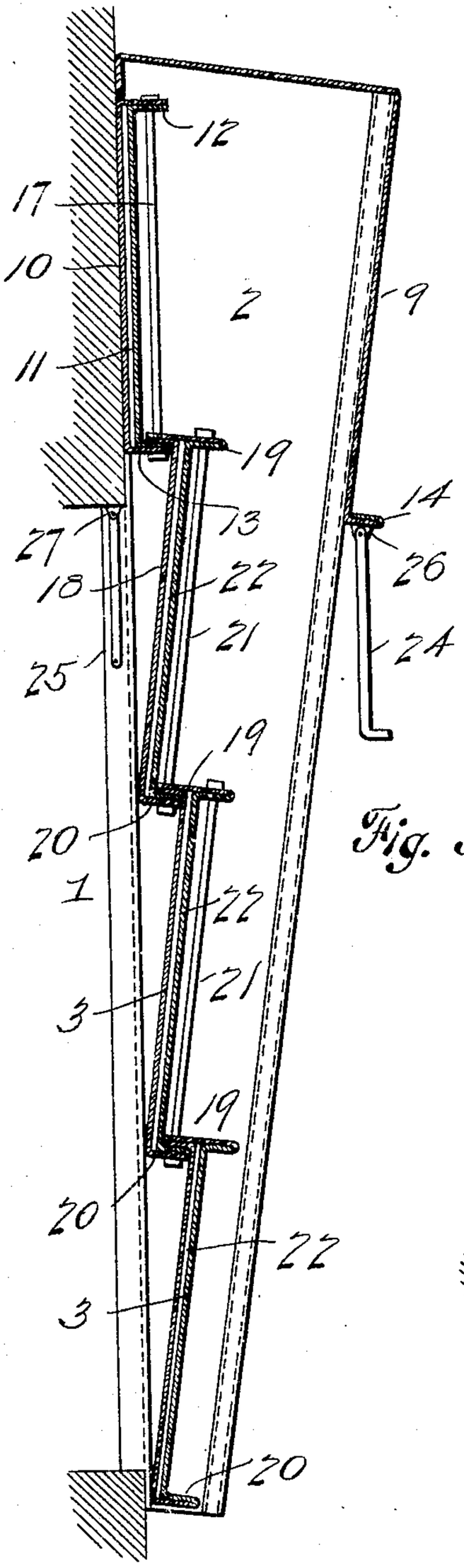

Fig. 3.

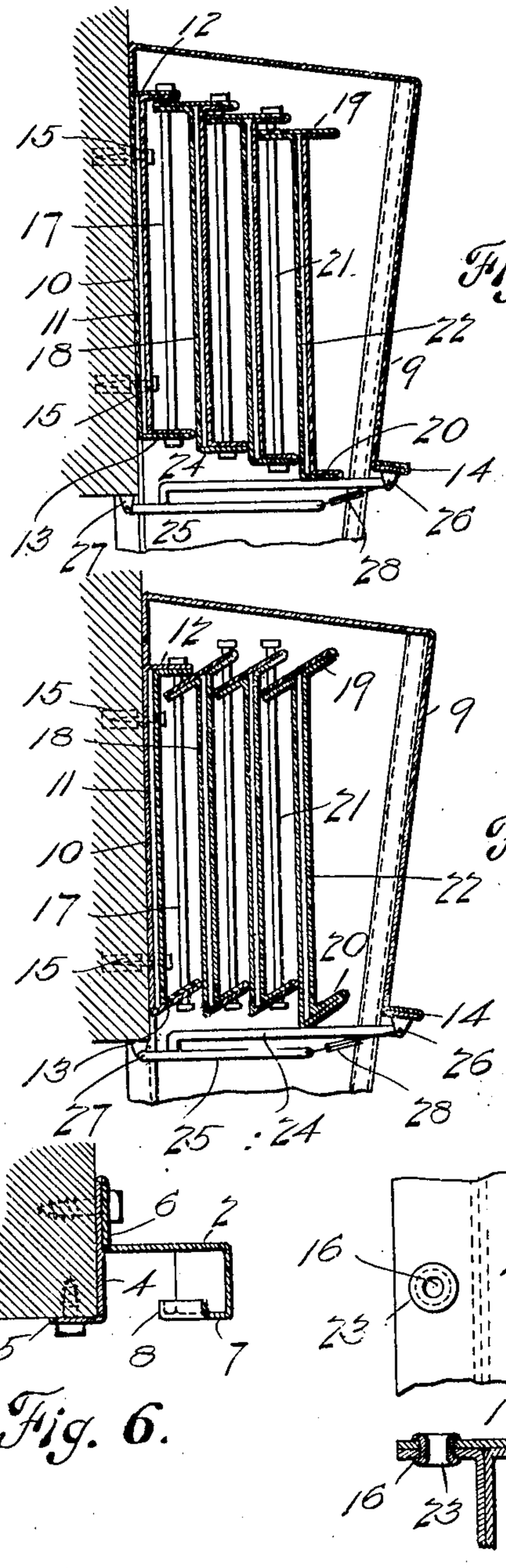

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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H. N. Jenkins.

J. R. Nottingham

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ATT'Y

UNITED STATES PATENT OFFICE.

HENRY L. FISH, OF BUFFALO, NEW YORK.

FIREPROOF SHUTTER, CURTAIN, &c.

No. 916,288. Specification of Letters Patent. Patented March 23, 1909.

Application filed October 19, 1908. Serial No. 458,568.

To all whom it may concern:

Be it known that I, HENRY L. FISH, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Fireproof Shutters, Curtains, or Similar Articles, of which the following is a specification.

This invention relates to automatically-operated or self-closing shutters or doors, and it consists of a shutter or door composed of a plurality of metal plates, so connected and arranged as to permit of their being folded in compact form within a suitable hood or housing, and upon being released will drop by gravity, thus closing the opening over which they are placed.

The invention further consists of a suitable device for supporting the sectional shutter or door in its closed or folded position, and fusible means for holding the support in normal position.

The invention still further consists of the novel construction and arrangement of the several parts, as will be hereinafter fully described in this specification and briefly stated in the claims.

One of the prime objects of the invention is to produce a fire-proof shutter or door, of the character described that can be readily attached to a building without cutting or otherwise defacing the same, and neither occupying valuable space nor shutting out air or light. This and other objects are attained by means of the mechanism illustrated in the accompanying drawing, in which:

Figure 1 is a vertical section of my improved device, showing the sectional shutter or door in position to close the opening in the building to which it is attached; Fig. 2, a front elevation of the same, broken in two, vertically, the hood or housing being removed; Fig. 3, a view similar to Fig. 1, showing another form of construction of the sectional shutter or door, showing hood; Fig. 4, a vertical section of the shutter or door, shown in Fig. 3, held in folded or closed position within the hood or housing; Fig. 5, a similar view of the form of shutter or door shown in Fig. 1; Fig. 6, a transverse section of one of the side guides, shown in Figs. 1 and 2; and Figs. 7 and 8, top plan and vertical sectional views respectively of a portion of one of the shutter sections.

Referring to the several views, the numeral 1 indicates an opening in the wall of a building, said opening being either a window or doorway. Attached to the wall of a building, at each side of the opening, is a metal side-piece 2, which serves as a guide to the sectional shutter or door 3, as it is raised or dropped. The front of each side-piece inclines inwardly from the top to the bottom as shown in Figs. 1 and 3, and 9 and each side-piece consists preferably of a sheet of steel having a base 4, provided with a flange 5, and a bent-over portion 6, by means of which it is attached to the sides of the opening, by suitable screws or bolts, as more clearly shown in Fig. 6. The front of the side-pieces is formed by bending the sheet at right angles to form a facing 7, and a retained edge 8.

The numeral 9 indicates a hood or housing consisting preferably of sheet steel and it is bent so as to set in back of the top slat next to wall of building extending up and over the top of shutter and side guides, then down over the front of same to the top of the opening, being bolted into the front of the side guides, forming a hood for the purpose of covering the shutter while in raised position, thereby keeping out the elements. The front or lower edge of the hood is provided with a double horizontal flange, for the purpose of rigidity and holding the shutter in place by the releasing lever which is attached to the ear 26. It is fastened to the wall of the building by bolts, same as those which fasten the top slat or dummy of shutter. The top slat consists of a double-wall base 10, between which walls is a filling of asbestos or other heat resistant or non-conductor 11. The bottom and top of the base are provided with lips 12 and 13, respectively, and the front lower edge of the hood is provided with a horizontal flange 14. The hood or housing is fastened to the wall of the building by means of screws or bolts 15, as shown in Figs. 4, and 5, and the lips 12 and 13 are provided with holes 16, through which bolts or rods 17, are passed to pivot or hinge, the second section 18 of the shutter or door. Each section of the shutter or door is composed of a double wall of steel; preferably sheet steel, having an oppositely flanged upper edge 19, and a single flanged bottom edge 20, and each section is pivoted or hinged to the other by means of bolts or rods 21, passing through holes in the respective flanges. In Figs. 1

and 5, the upper and lower flanges are set at an angle parallel with each other, while in Figs. 3 and 4, they are at right angles to the body of the sections.

The spaces between the walls of the several sections are filled with asbestos or other heat resistant or non-conductor 22. Each of the holes through which the bolts or rods 17 and 21, pass, is provided with an anti-friction guide, thimble or bearing 23, as shown in Figs. 7 and 8, whereby any tendency of the sections to stick or hang in dropping, is entirely prevented.

When the sections of the shutter are in their normal position, folded within the hood or housing, they are supported in such position by an arrangement of hooks or levers 24 and 25, lever 24 being hinged to an ear 26, attached to the flange 14, at the center, and the lever 25 being hinged to an ear 27, secured to the upper edge of the opening in the wall. The free end of the lever 24, is supported upon the lever 25, and the free end of the lever 25, is connected to the ear 26, by a fusible link 28.

The operation of the device will be obvious from the above description, it only being necessary to state that the link 28, becoming fused, the supporting levers will drop, and the shutter or door being released, will automatically drop, its descent being facilitated and rendered more positive by the additional weight of the bolts or rods, connecting the lower sections to the upper section.

I am aware that fire proof curtains, shutters, and the like, have been made, the slats or sections of which are adapted to slide over each other upon rising, having as guide sections a slotted portion on one slat or section, which is engaged by fixed guide projections on a second slide or section adapted to travel in the said slot; it can be seen, however, that such construction leaves slotted openings in the guide sections or slats of the shutter or curtain and admits of the accumulation of dust, dirt and rust in the slot, which increases friction and hinders the rapid closing of the shutter by gravity when the retaining device which maintains the shutter in a normally folded condition, is released. In the present invention it will be seen that such objection and difficulty is avoided as the sections or slats travel on guide bolts or similar devices, arranged to operate and depend at an angle to a perpendicular, in an upward and downward direction, on folding or extending the curtain, and the sleeve or thimble which travels upon and over said guide bolt contacts with the said guide bolt, at a point or on a line only in contradistinction to and from the broad surface contact found in devices of the prior art. The thimble or sleeve which travels on the guide bolts is also provided with or composed of an anti-friction substance or material to admit of the falling of the shutter or curtain with the least possible resistance. It will also be noted that each section or slat of the curtain or shutter carries the guide bolts for the succeeding section or slat, which increases the weight thereof and facilitates the falling of the curtain or shutter, and also that the weight of the falling portion decreases progressively as each section of the slat, weighted by its guide bolts for the succeeding slat, comes to rest upon engaging the lower section of the preceding or upper section or slat at the lower end section of the guide bolts and where the end sections or edges of the sections or slats are at an oblique and outwardly ascending angle to the slat or section, as shown in Figs. 1 and 5, they interlock in a hanging position, and thus relieve to a great extent the dead weight or pinching or binding grip of the sections on the guide bolts, and also should intense heat continue, and the guide bolts by any chance become twisted or loosened, the shutter will remain intact, still preventing the spread of flames.

It should be noted that the closing means revealed in the present invention is adapted to be employed to cover openings from the exterior of the buildings, each slat of the shutter of which is adapted to engage or communicate with the frame of the opening at its base in such a manner as to present a shutter provided with a series or plurality of plates or slats arranged vertically at an angle to a perpendicular and each provided with a traveling guide-rod or rods disposed at a similar angle, by which means each of the movable slats is adapted to fall in an angular direction when released toward the frame of the opening to be covered and to rest with the lower edge of each slat in communication with the frame of the opening, the whole shutter falling in a line disposed at an angle to the frame of the opening to be closed, the distance from said shutter to said opening decreasing from top to bottom.

Various changes or modifications may be made in the details of construction of my improved self-closing shutter or door, such, for instance, as changing the angle of the upper and lower flanges of the several sections, as shown in Figs. 1 and 3, so as to overcome any strain that might be in the bolts or rods, where the flanges are at right angles to the body of the section.

The plurality of metal or asbestos-metal plates forming the shutter, curtain or shield, may be made in any suitable form or shape and formed of sheet metal, stamped, pressed or otherwise manufactured, without departing from the spirit of my invention or sacrificing the principle thereof, and the form, shape or arrangement of either or all of the members of the combination may also be altered to adapt the same to the particular character of door, window or other structure

or opening, to be covered, closed or protected, so long as the integrity of the combination of the members is not destroyed or their individual functional character departed from.

Throughout the claims hereto the individual movable parts of the shutter referred to as plates or sections or slats are designated as "slats" which term is intended to cover any shape or form of section adapted for the particular purpose to be applied, be it a single movable section or plate or a plurality thereof.

The "ribs" or "extensions" referred to herein as providing a means of support or attachment for the guides or guide bolts to or upon the shutter, curtain or other similar device, and for presenting or supporting the bearing for the slidable device, which is adapted to carry the various slats upon the guides is intended to include and does include any suitable means, such as lugs, flanges or other devices, as well as "ribs" or "extensions" specifically, and the said devices may constitute an integral part of the slat or form an adjunctive device directly or indirectly in operative communication with the shutter, curtain, or similar article.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A fire-shutter, curtain or shield, composed of a series of slats provided with angular ribs or extensions, said ribs or extensions being provided on one side with guide bolts, arranged to operate and depend at an angle to a perpendicular and on their opposite side with apertures which engage with the guide bolts of the adjoining slats.

2. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guides, arranged to operate and depend at an angle to a perpendicular and on their opposite side with apertures which engage with the guides of the adjoining slat.

3. A fire-shutter, curtain or shield, composed of a series of slats provided with angular ribs or extensions, said ribs or extensions being provided on one side with guides, arranged to operate and depend at an angle to a perpendicular and on their opposite side with rings which engage with the guides of the adjoining slat.

4. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guides, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction apertures which engage with the guides of the adjoining slat.

5. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guides, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction rings which engage with the guides of the adjoining slat.

6. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guides, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction bearings which engage with the guides of the adjoining slat.

7. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guide bolts, arranged to operate and depend at an angle to a perpendicular and on their opposite side with rings which engage with the guide bolts of the adjoining slat.

8. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guide bolts, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction apertures which engage with the guide bolts of the adjoining slat.

9. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guide bolts, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction rings which engage with the guide bolts of the adjoining slat.

10. A fire-shutter, curtain or shield, composed of a series of slats, provided with angular ribs or extensions, said ribs or extensions being provided on one side with guide bolts, arranged to operate and depend at an angle to a perpendicular and on their opposite side with anti-friction bearings which engage with the guide bolts of the adjoining slat.

11. The combination with an opening in a wall, of a shutter or door composed of a plurality of sections, connected together by sleeves traveling on bolts, arranged to operate and depend at an angle to a perpendicular in such a manner as to be folded one against the other, means for supporting the sections in folded position, and a fusible connection for normally maintaining the supporting means in normal position.

12. The combination with an opening in a wall, of a shutter or door composed of a plurality of sections slidably connected together by sleeves traveling on bolts, arranged to operate and depend at an angle to a perpendicular, side-pieces for guiding the

sections in their descent, a support for normally holding said sections in folded position, and a fusible connection for normally holding the support against accidental displacement.

13. The combination with an opening in a wall, of a shutter or door composed of a plurality of sections provided with oppositely-extending flanges at their upper edge and with a single outwardly-extending flange at their lower edge, anti-friction apertures in said flanges, and suitable bolts, arranged to operate and depend at an angle to a perpendicular passing through said apertures, for slidably-connecting the sections together.

14. The combination with an opening in a wall, of a shutter or door, composed of a plurality of sections provided with oppositely-extending flanges at their upper edge and with a single outwardly-extending flange at their lower edge, anti-friction apertures in said flanges, suitable bolts, arranged to operate and depend at an angle to a perpendicular passing through said apertures, for slidably-connecting the sections together, means for supporting the sections in folded position, and a fusible connection for normally holding the supporting means against accidental displacement.

15. A fire-shutter, curtain or shield, composed of a series of slats, provided with annular ribs or extensions, said ribs or extensions being provided on one side with guides arranged to operate and depend at an angle to a perpendicular, and on their opposite side with apertures which engage with the guides of the adjoining slat, a support for normally holding said sections in folded position, and a fusible connection for normally holding the support against accidental displacement.

16. A fire-shutter, curtain or shield, composed of a series of slats, provided with annular ribs or extensions, said ribs or extensions being provided on one side with guides arranged to operate and depend at an angle to a perpendicular, and on their opposite side with apertures which engage with the guides of the adjoining slat, and a support for normally holding said sections in a folded position.

17. A fire-shutter, curtain or shield, composed of a series of slats, provided with annular ribs or extensions, said ribs or extensions being provided on one side with guides arranged to operate and depend at an angle to a perpendicular, and on their opposite side with apertures which engage with the guides of the adjoining slat, a support for normally holding said sections in a folded position, and a hood or housing for the folded members.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY L. FISH.

Witnesses:

THOMAS MCCRAW,

HERBERT H. ARMSTRONG.