

J. BROGDEN & J. W. WATKINS.

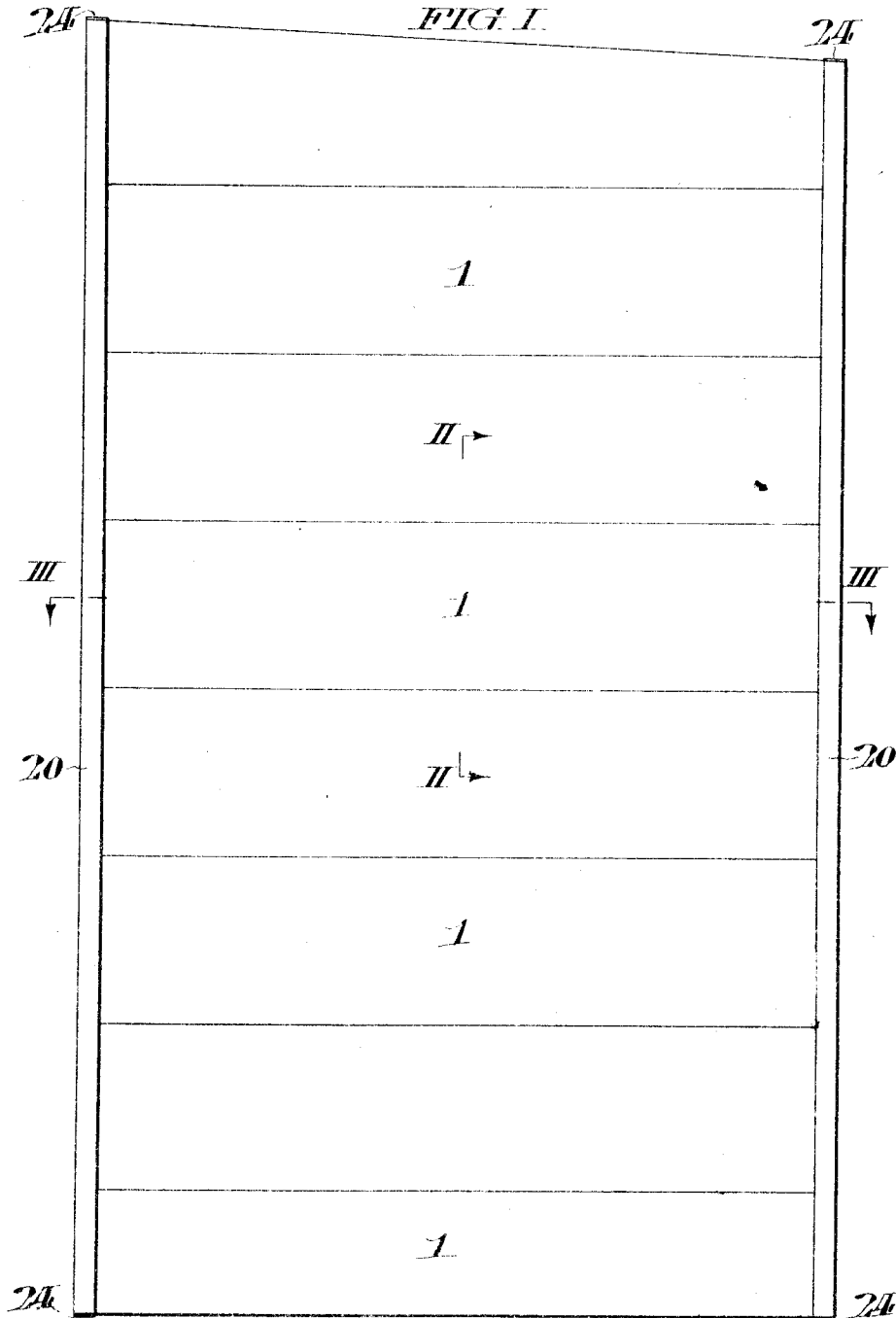
FIRE RETARDING CLOSURE.

APPLICATION FILED DEC. 24, 1907.

1,062,563.

Patented May 20, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

John C. Beaguer
Wm. J. Spier

INVENTORS:

JOAH BROGDEN
JOHN W. WATKINS,
by their attorneys
Macy & Raul

J. BROGDEN & J. W. WATKINS.

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FIG. II.

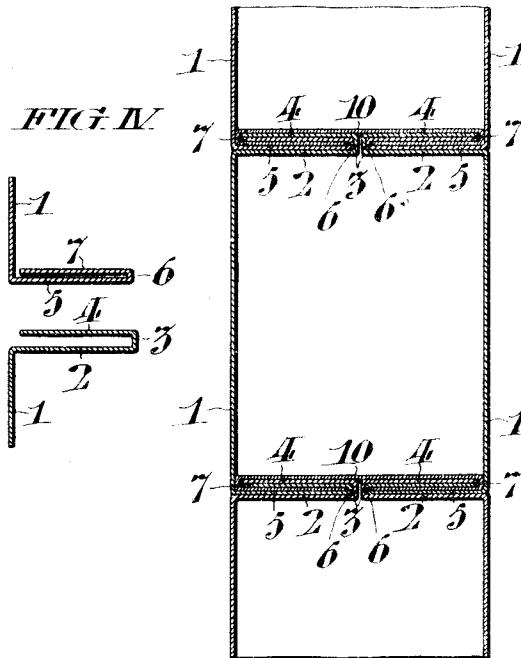


FIG. V.



FIG. III.

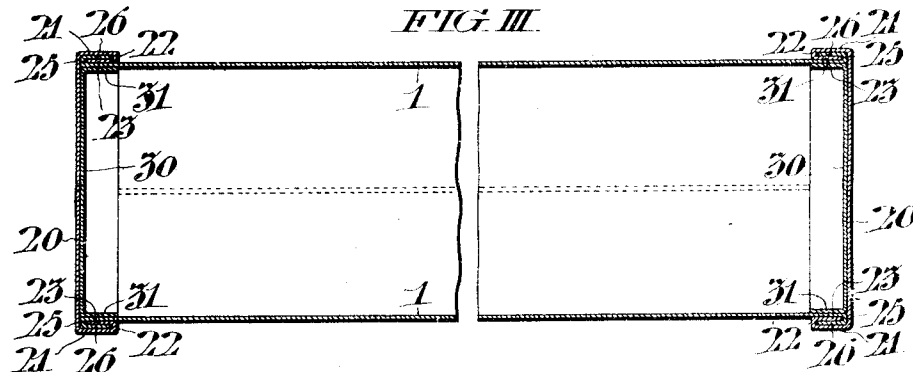
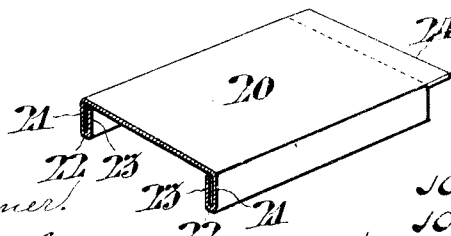


FIG. VI.



WITNESSES:

John C. Berger
Wm J. Spurl

INVENTORS:

JOAH BROGDEN
AND
JOHN W. WATKINS,
by their Attorneys
Friley & Ruff

UNITED STATES PATENT OFFICE.

JOAH BROGDEN AND JOHN W. WATKINS, OF PHILADELPHIA, PENNSYLVANIA, AS-
SIGNORS TO DAVID LUPTON'S SONS COMPANY, OF PHILADELPHIA, PENNSYLVANIA,
A CORPORATION OF PENNSYLVANIA.

FIRE-RETARDING CLOSURE.

1,062,563.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed December 24, 1907. Serial No. 407,976.

To all whom it may concern:

Be it known that we, JOAH BROGDEN and JOHN W. WATKINS, both of the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Fire-Retarding Closures, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to fire retarding closures formed from sheet metal.

We form the closure by combining a series of interlocked sheet metal sections. These separable sections are preferably interchangeable and in the form of rectangular metal tubes, which when interlocked in series, produce a hollow double walled metal closure. But although the closure thus formed has two metal walls, there is absence of continuity of the walls and this prevents their warping in the way in which a continuous metal surface warps under the influence of intense heat.

In the accompanying drawings, Figure I, represents in front elevation a sliding fire-door constructed according to our invention. Fig. II, is a vertical cross section along the line II, II, in Fig. I, showing a method of interlocking the sections. Fig. III, is a broken horizontal section along the line III, III, of Fig. I. Figs. IV, V, and VI, are detail views of the parts used in building up our structure.

According to our invention the door or shutter, or other closure, to which it is to be applied, is constructed of a series of hollow rectangular tubular sheet-metal sections of which the central section shown in Fig. II, may be taken as a type. Referring to this section it will be observed that it consists of two side walls 1, 1. At the top, each of these side walls is bent in, up and out again along the lines 2, 3, and 4, as shown more clearly in the detached lowermost portion of Fig. IV. The bottom of the side walls 1, is likewise bent inward and upward and out again in a slightly different contour, as indicated by the lines 5, 6, and 7, of the detached upper part of Fig. IV. These tops and bottoms interlock as seen in Fig. II. The side walls 1, together with the bent portions thereof at the top and bottom of each section of side wall form channel shaped sections, which, when united, form rectangular

tubular sections. In order to unite the two sides a sliding union is employed having the form shown in Fig. V.

In the assembling of the pieces, the corresponding upper and lower edges of the side sections are interlocked by slipping the portions which correspond to the lower part of Fig. IV, over those which correspond to the upper part of the same figure, and when both sides have been thus interlocked the union 10, is slipped endwise along their interlocked edges as shown in Fig. II, securely uniting the whole together. This process is repeated at each of the joints between the section. A sufficient number of sections are thus united to build up the closure to the desired height.

All of the sections may be alike, or if a special shape is desired, one or more of the sections may be of special contour, as for instance, in Fig. I, where, for the production of a hung door, which descends upon a slightly inclined track, the uppermost section has a sloping top corresponding to this incline, as shown in the drawings. This necessitates a section of special contour at the top of the door. The width of the sections will preferably correspond to the width of the closure and at the two ends the entire assembled sections have attached to them interlocked end pieces shown in Fig. III, which consist of plates 20, having their edges bent down, in and up along the lines 21, 22 and 23, as shown in Fig. VI, and at each end a short flap 24, extending beyond the bent edges. The end of the sides 1, are bent at right angles and then back parallel to the sides along the lines 25, and 26, as shown in Fig. III, and in such a manner as to interlock with the folds 21, 22, and 23. In order to maintain the tubular sections in proper shape for assemblage a cap member 30, is provided having its four edges bent in, as shown at 31, in Fig. III, and inserted within each end of said tubular section. The locking member 20, is then slid over the ends of the tubular sections and has its bent portions 21, 22, and 23, interlocked with the bent portions 25, and 26, of the sides 1, 1, and when this member is in position the flaps 24, are turned inwardly against the outer faces of the closure to lock said member and tubular sections in position as shown in Fig. I.

Although we have described a preferred

form of construction it will be understood that the interlocking tubular sections may be made of various shapes and sizes and that the method of their interlocking may be much varied, as our invention is independent of the shape and method of interlocking the sections. Various dove-tails for interlocking the sections may readily be produced. Accordingly our invention is not limited to any particular method of interlocking the sections, but relates to a composite sheet metal closure built up by uniting one hollow section with another, so that the entire closure is built up of wholly independent tubular sections, with the production of discontinuous sheet metal walls for the closure and with an intervening air space. The result of this method of construction is to overcome and nullify the tendency of the hollow sheet metal closure to warp under extreme heat. If a fire retarding door be made of one or more continuous sheets of metal, the influence of heat produces a warping or buckling of the same, which as the heat grows greater, becomes more and more marked, always bulging out in the same direction, until an aperture results which allows free penetration of the fire. On the other hand, by our construction this warping tendency is overcome, for although the side walls of one section may warp under the influence of heat, becoming convex or concave as the metal expands more and more, yet by reason of the lack of continuity of the side of the closure, owing to its sectional construction, the warping or bending of one piece has no tendency to create a similar warping of the next piece, so that instead of the entire structure bending in or out, each section acts independently of the other, producing only a slightly corrugated or wavy surface instead of the warping or bending which is invariably produced where the metal surface of the closure is continuous.

It is also characteristic of our invention that the sections are hollow and practically contain only air. Closures have heretofore been made by sheathing pieces of wood with metal and then uniting a number of said sheathed pieces. The metal sections in such structures do not, except incidentally, contain air, and they are not essentially self-sustaining. Such a structure is still primarily a wooden structure with the disadvantages that under the heat of conflagration the wood is destroyed by distillation, and the gases thus generating burst the metal sections and destroy the closure. Our structure is distinguished from these in that the sections are hollow air containing structures without the presence of wood or other combustible material. Under certain circumstances, it is desirable to place within these hollow spaces, incombustible heat insulating materials or compounds, such, for instance,

as asbestos or magnesia. In this way the fire retarding qualities of the closure may be increased. Each section remains essentially a hollow air containing structure. We have therefore in the claims defined the hollow sheet metal sections of our closure as air containing, and as being without the presence of wood or other combustible material.

Having thus described our invention, we claim:—

1. A hollow fire closure formed wholly of non-combustible material and consisting of separated walls having an air space between them, each wall being formed of a series of discontinuous self-sustaining channel shaped sheet metal sections in close parallel juxtaposition to each other, said sections being connected and supported wholly by the inseparable interlocking in fixed relation of the side edges of one section with the side edges of the adjacent section, and said walls being connected and supported solely by spaced non-combustible cross partitions.

2. A hollow fire closure formed wholly of non-combustible material and consisting of separated walls having an air space between them, each wall being formed of a series of discontinuous self-sustaining channel shaped sheet metal sections in close parallel juxtaposition to each other, said sections being connected and supported wholly by the inseparable interlocking in fixed relation of the side edges of one section with the side edges of the adjacent section, and said walls being connected and supported solely by spaced non-combustible cross partitions, interlocked with the interlocking parts of the adjacent edges of said sheet metal sections.

3. A fire-retarding closure comprising a series of hollow sheet metal sections, each formed of a pair of plates having their side edges bent to form interlocking portions, united by unions, and the ends of said plates having portions bent at right angles and then back parallel to the sides of the sections; and locking members slidably engaging the bent ends of said sections.

4. A fire-retarding closure comprising a series of hollow sheet metal sections, each formed of a pair of plates having their side edges bent to form interlocking portions, united by unions, and the ends of said plates having portions bent at right angles, and then back parallel to the sides of the sections; a cap member fitted in the end of each section; and locking members slidably engaging the bent ends of said sections.

5. A fire-retarding closure comprising a series of hollow sheet metal sections, each formed of a pair of plates having their side edges bent to form interlocking portions, united by unions, and the ends of said plates having portions bent at right angles and then back parallel to the sides of the sections; and locking members having their

edges formed with complementary bends for slidably engaging and interlocking the bent ends of said sections.

6. A fire retarding closure comprising a series of hollow rectangular sheet metal sections, each formed of a pair of plates having their side edges bent at right angles, then parallel, then at right angles to the main portion of said plates, said bends being of such length that the bent edges of one plate may nest with the corresponding bent edges of the adjoining plate of the next section; a

union for permanently uniting said sections; and a plate closing and interlocking with the ends of said sections.

In testimony whereof, we have hereunto signed our names, at Philadelphia, Pennsylvania, this twenty-third day of December, 1907.

JOAH BROGDEN.
JOHN W. WATKINS.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.