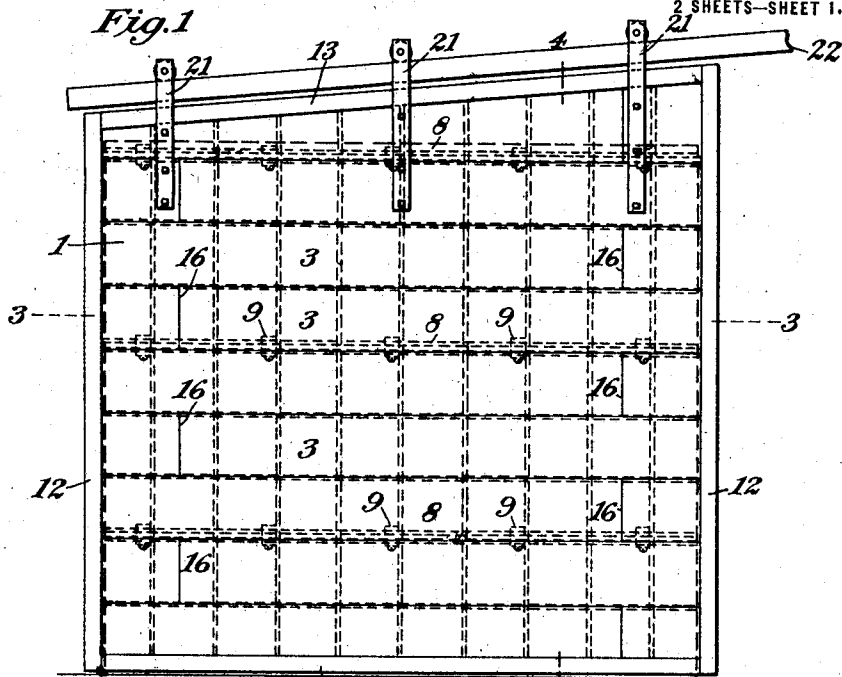
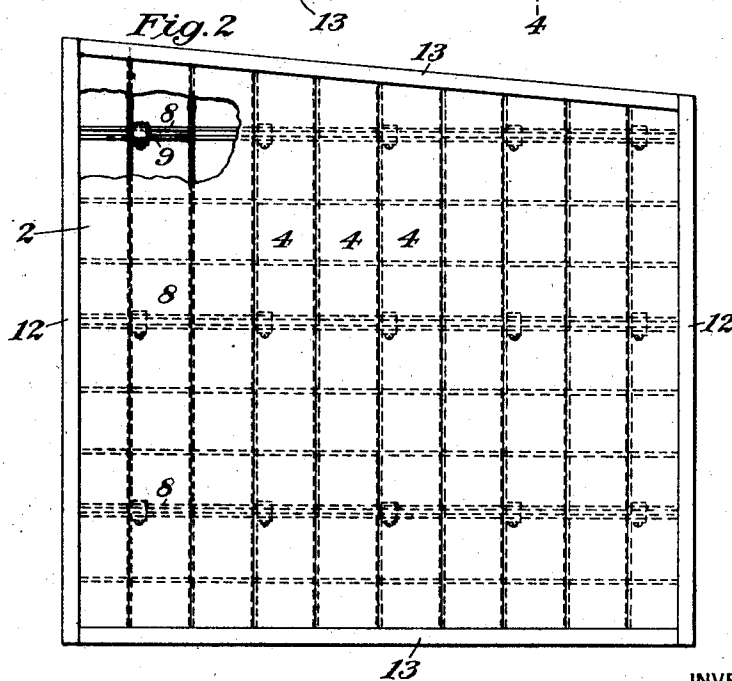


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APPLICATION FILED MAY 20, 1919.

1,339,205.

Patented May 4, 1920.

2 SHEETS—SHEET 1.



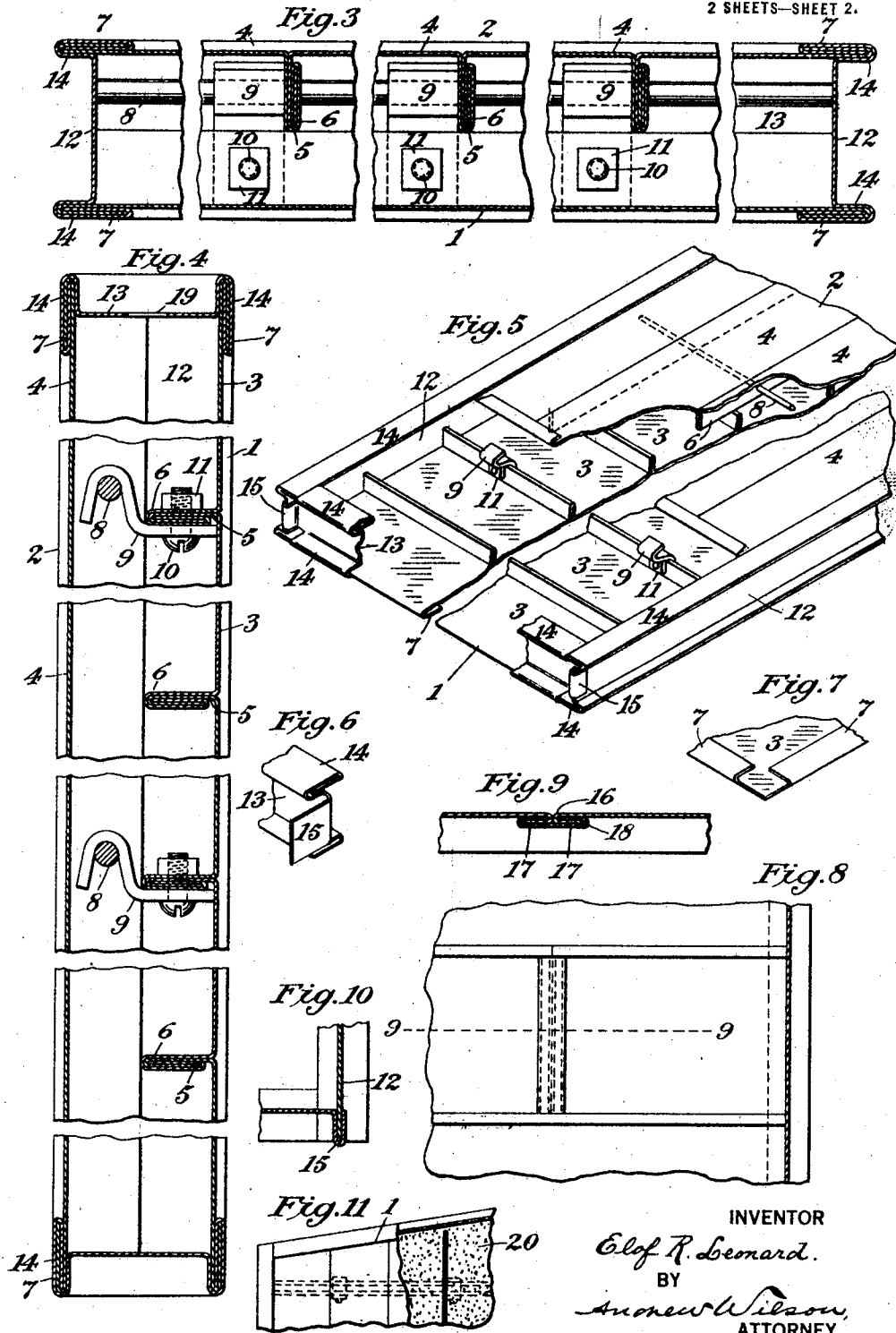
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UNITED STATES PATENT OFFICE.

ELOF R. LEONARD, OF WOODCLIFF, NEW JERSEY.

FIREPROOF DOOR.

1,339,205.

Specification of Letters Patent.

Patented May 4, 1920.

Application filed May 20, 1919. Serial No. 298,377.

To all whom it may concern:

Be it known that I, ELOF R. LEONARD, a citizen of the United States, residing at Woodcliff, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Fireproof Doors, of which the following is a specification.

My invention relates to doors and similar structures which are intended to resist heat, as in fire doors, or cold, as in doors of refrigerating structures; and my improvements are directed to means whereby such doors may be made of interlocking metal sections, which may be readily assembled into a desired form of structure, and with which an insulating filling may be used if desired.

The particulars of my invention I will now proceed to point out and explain, referring, in so doing, to the accompanying drawings, in which all the parts are designated by similar reference numerals, and in which Figure 1 is a view of one side and Fig. 2 a view of the opposite side of a fire door embodying my improved construction; Fig. 3 is a cross sectional view on a considerably enlarged scale, taken as on the line 3—3 of Fig. 1 looking down; Fig. 4 is a vertical sectional view on a considerably enlarged scale, taken as on the line 4—4 of Fig. 1, looking to the right; medial portions are broken away in Figs. 3 and 4 to shorten the figures; Fig. 5 is a view in perspective, partially broken away, showing the door partly assembled; Fig. 6 is a detail of the end of one of the end plates; Fig. 7 is a detail of a corner of one of the side plates; Fig. 8 is a plan view showing the method of splicing plates; Fig. 9 is a longitudinal sectional view of a portion of Fig. 8, and on an enlarged scale, taken on line 9—9 and looking up; Fig. 10 is a sectional view of a corner showing the manner in which the end plate and side plate are united; and Fig. 11 is a detail of one corner of a completed door, partly broken away, to show insulating material within the door.

Figs. 5, 6, 7, 8, 9, 10 and 11 are all on an enlarged scale as compared with Figs. 1 and 2.

In the form illustrated in the drawings, my invention is shown as embodied in a fire door which is formed with two composite sides 1 and 2. Each of these sides

side 1 being designated by the numeral 3, and those of the side 2 being designated by the numeral 4. These plates are provided upon their edges with flanges 5, 6, which are adapted to be interlocked by sliding the plates lengthwise in reference to each other, so that the flange 5 on the edge of one plate slips within the flange 6 on the edge of the next plate, so as to form lap seams securely uniting the plates without the use of solder or rivets. The ends of the end plates 3 and 4 are also provided with flanges 7, preferably turned outward, as shown, so that the sides 1 and 2 when placed in position upon each other present outwardly and backwardly turned flanges all around their edges. The inwardly turned and interlocking flanges 5, 6 of the plate 2 are perforated to receive a series of transverse rods 8, 8, indicated on Figs. 1 and 2 as being three in number; while the interlocking flanges 5, 6 of the side 1 are provided with a series of hooks 9, 9 firmly secured thereto as by bolts and nuts 10 and 11, the hooks being adapted to engage the rods when the two sides 1 and 2 are laid one upon the other with their composite flanges crossing each other at right angles, as illustrated in Figs. 3 and 4. Side plates 12, 12, having the general form of I beams are provided with lap seam flanges 14, 14; and end plates 13 are provided with similar lap seam flanges 14, the flanges 14 on the side plates and end plates being adapted to interlock with the flanges 7 on the sides 1 and 2 which slide lengthwise over the same.

The end plates 13 are preferably provided with tongues 15, normally bent up at right angles as shown in Fig. 6, but adapted to be clenched around the web of the side plate 12 as shown in Figs. 5 and 10, when the side plates and end plates have been properly assembled with the sides 1 and 2.

It sometimes happens that because of the size of the metal plate, or because of the size of the metal bending machine in which the plates are prepared, it is necessary to splice the plates to obtain greater length. When this happens it may be done by turning flanges 17, 17 inward upon the edges of the plates and then sliding a strip with an inwardly turned flange on each edge, as 18, over the adjacent flanges 17, 17. When this is done and the interlocking flange of the adjacent plate, as 3, Fig. 1, is interlocked with the complementary flange of the spliced

plate a strong and durable splice will be secured. It will be understood that if the edge flange 6 interferes with the locking member 18 being slid over the flanges 17, 17, the edge flange 6 may be at that point cut down to the level of the body plate, so as to permit the sliding into position of the locking element 18.

At the corner of the sides 1 and 2 it is preferable to cut away the flanges 7, 7 as shown in Fig. 7 so as to permit of sliding the side plates and end plates into position without trouble, in the operation of assembling the parts of a door. That assembling may be done as follows:

The plates composing the respective sides 1 and 2 are first interlocked with each other until the desired width and length of the respective sides are obtained.

A suitable number of hooks, as 9, are then secured to the flange of the side 1; and a suitable number of rods 8 are passed through appropriate apertures in the flanges of the side 2. The attachment of the hooks and insertion of the rods effectually prevent any sliding of the plate members of the respective sides relative to each other. An end plate may then be slid into position to unite one end of the sides 1 and 2. A side piece may then be slid on; the other end piece may then be slid into position from the direction of the open side; and then the other side plate may be slid on thus closing the edges of the composite door. The flanges 15 on the end plates may then be bent over and clenched upon the web of the side plate 12, thus locking the parts against further relative movement.

If desired, the laps of the end plates and side plates may be welded together to secure further rigidity.

If it is desired to fill the door with non-conducting material 20, as asbestos for fire doors or cork for refrigerating doors, this may be done by first filling the spaces between the flanges of one side, for instance of the side 1 as shown in Fig. 5, with the desired material, then assembling the door, then filling the remaining space by inserting the material through a series of holes 19, in the upper end plate 13. One of these holes is indicated in Fig. 4. And it will be understood that the series of holes should be so placed that one of them will register between each pair of composite flanges 5, 6 of the side 2.

When the interior of the door is not filled with a heat or cold resisting substance as above suggested, the holes 19 serve a valuable purpose in affording ventilation to the interior of the door without impairing its efficiency.

It will be seen that by the use of my improvements I produce a door which is made entirely of metal plates, interlocked to-

gether, presenting the attractive appearance of a smooth surface crossed by regular seam lines and surrounded by an out-turned lap seam giving an attractive bead-like finish, and the edges of the door being grooved. This lap seam construction allows the door to expand and contract when subjected to heat without the plates buckling as they do in the ordinary constructions of metal-covered wooden doors or in any construction where a flush seamed construction is used.

This is a great advantage. Furthermore by securing the sides together by interior connections and then closing in their edges, as described, I avoid the use of nails, bolts or rivets showing upon the exterior surfaces of the door, thus adding to the attractiveness of the finished article and eliminating from its construction projections or fastening elements which are likely to catch or be caught by persons or things coming in contact with them.

This method of construction permits of preparing and keeping the prepared elements of the door in stock in a knock-down condition and of assembling them when required to form doors or other articles of the desired dimensions.

Additional plates 4, 4 may be added if it is desired to increase the width of the door, longer rods 8 and ends 13 and plates 3 being used to correspond with the increased width; and if a longer door is desired additional plates 3, 3 may be inserted, larger sizes of the other elements being used to correspond with the increased length of the door.

I have shown my door as equipped with trolley arms 21 to carry it upon a track 22. But of course any suitable suspension device, as hinges, may be employed; and I do not limit myself to the use of the particular form of carrying means shown.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is,

1. A double, metal door having sides each composed of a plurality of sheet metal elements united and held together by interiorly disposed interlocking lap-seam flanges extending inwardly at right angles to the plane of the sides, the flanges of one side being disposed transversely to and bearing against those of the other side, a series of interiorly disposed anchors fixedly secured to and carried by the flanges of one side so as to prevent relative shifting of the sheet metal elements of that side, an independent series of interiorly disposed anchor holds fixedly secured to and carried by the flanges of the other side and preventing relative shifting of the sheet metal elements of that side, and interlocking edge means for uniting the sides.

2. A double, metal door having sides each composed of a plurality of sheet metal elements united by interiorly disposed interlocking lap-seam flanges extending inwardly at right angles to the plane of the side, the flanges of one side being disposed transversely to and bearing against those of the other side, a series of interiorly disposed anchors fixedly secured to and carried by the flanges of one side, and extending out beyond the same, an independent series of interiorly disposed anchor holds fixedly secured to and carried by the flanges of the other side, below the level of their free edges, and edge and end elements interlocking with the sides.

3. A double, metal door having sides each composed of a plurality of sheet metal elements united by interiorly disposed interlocking lap-seam flanges, the flanges of one side being disposed transversely to and bear-

ing against those of the other side, a series of interiorly disposed hooks forming anchors carried by one side, a series of interiorly disposed rods forming anchor holds carried by the other side, and edge and end elements interlocking with the sides.

4. A double, metal door having sides each composed of a plurality of sheet metal elements united by interiorly disposed interlocking lap-seam flanges extending inwardly at right angles to the plane of the side, the flanges of one side being disposed transversely to and bearing against those of the other side, a series of interiorly disposed anchors each secured through and carried by an interlocked flange of one side, a series of interiorly disposed anchor holds inserted through and carried by the flanges of the other side, and edge and end elements interlocking with the sides.

ELOF R. LEONARD.