

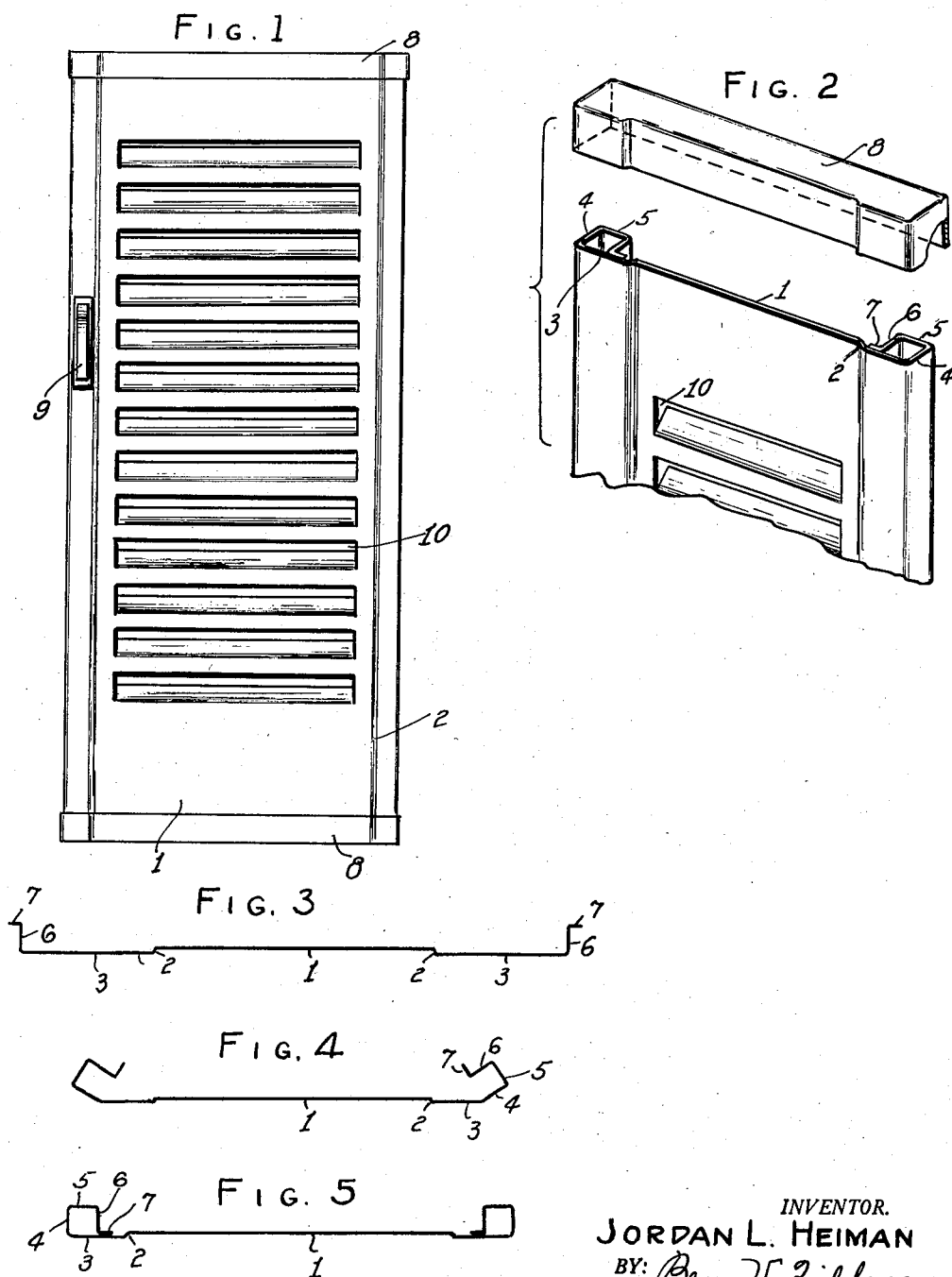
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SHEET METAL DOOR

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SHEET METAL DOOR

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This invention relates to improvements in doors and more especially to those made of sheet metal, as for instance in doors forming a part of the casing or enclosing mechanism for heaters, stoves, furnaces and the like, and has among its objects the production of such a door as may be conveniently and economically constructed in the main, from a single sheet of metal, that will be neat and compact in appearance, be sturdy and long-lasting, and which will be otherwise satisfactory and efficient for use wherever deemed applicable.

One of the principal objects of my invention is to so construct such a door that it will be especially strong and rigid and easily withstand any tendency to warp, twist or otherwise get out of shape.

Another object of the invention is to so form such a door of sheet metal that doors of any usual length may be made, the doors having longitudinally extending hollow tubular reinforcing columns at the sides and formed integrally from the main body of the door material.

A further object of my invention is to so construct such doors that they may embrace a range of lengths, with a single width, so that a single size of cap members may be used for all such doors at the ends of the same, to complete their shape.

Many other objects and advantages of the construction herein shown and described, and the uses thereof, will be obvious to those skilled in the art to which this invention appertains, as will be more readily and clearly set forth in the description.

In the drawings, wherein like reference characters represent like or corresponding parts throughout the views,

Figure 1 is a front elevation of a door of my invention;

Figure 2 is an exploded perspective view of a portion of one of the ends of the same, showing the closure cap associated therewith; and

Figures 3, 4 and 5 illustrate diagrammatically the sequence of steps for forming the reinforcing columns at the sides of the panel.

Referring more particularly to the drawings, wherein I have illustrated a preferred embodiment of my invention, Figure 1 shows a sheet metal door of suitable size and gauge metal, as for example for use with relatively small devices such as oil-burner and heater casings for homes and small stores.

On account of employing relatively light weight sheet metal, there has been a tendency for such a door to become wobbly, warped, twisted, mis-aligned, etc., far too soon, and which not only impairs the efficiency of the device, but impairs the neatness and appearance of the unit.

Therefore, I have sought to remedy this situation, by strengthening the door in a simple manner and at low cost and readily performed in ordinary production methods, as will now be explained.

A substantially planar sheet of relatively light-weight metal, most generally sheet steel, is first formed in a

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a main or central panel portion 1 of desired length and width, with forwardly offset shoulders 2—2 extending lengthwise coextensive with the sheet and spaced inwardly from the terminal edges at the sides of the sheet.

Extending laterally outwardly from each of said shoulders is the substantially planar portions 3—3, and extending at an angle and from the outer longitudinal edges of said portions 3—3 are the portions 6—6 which terminate in end portions 7—7 bent at an angle to the portions 6—6.

It is to be mentioned here that the depth of said offsets are such as to be substantially equal to the thickness of the sheet metal, for a purpose soon to be set forth.

A second dieing operation, as indicated in Fig. 4 serves to bend a part of the portion 3 rearwardly at spaced apart parallel fold lines, to form the portions 4 and 5 in sequence adjoining the portion 3, to form partially closed channels at the sides of the sheet.

A third dieing operation is next had, as indicated in Fig. 5, to close the end portions or rather, side portions of the sheet into the shape of a column that extends longitudinally of the sheet and is co-extensive with the latter, whereupon the portions 3 and 5, and 4 and 6 are arranged parallel and spaced apart, and with the portion 7 superimposed on the rear face of the sheet and having its free terminal edge closely adjacent the shoulder. This portion 7 is welded or otherwise firmly secured in place thereat and the rear face of said portion will be substantially flush with the inner face of the central panel portion.

This method of construction is far superior to reinforcing the side edges of a panel with extraneous reinforcing bars, channels, angles or other formation, not only in reducing the cost of making reinforcements, but resulting in neater and more attractive design, without openings or crevices in which dirt or other foreign matter could lodge.

From the foregoing description it is seen that the hollow tubular columns thus formed are coextensive with the sheet length and with the column ends open, as seen most clearly in Fig. 2. Obviously, it is best to close such open ends, and this may be done with closure caps made of substantially the same weight of sheet metal as that for the main portion of the door, these caps also serving as additional reinforcement to add rigidity to the door structure.

One of said cap members 8 is used for each end of the door, and is somewhat in the shape of an open pan or receptacle, and of such size and shape that it may be telescopically received onto said door ends, and welded or otherwise rigidly secured in place thereat.

The door may be of any desired length, and it may have various openings therethrough, such as the louvers 10, and also have an operating handle 9 mounted on some part thereof at a convenient location.

A door made in this manner, of relatively light weight sheet metal, and which may have any required number of openings throughout its area, as indicated and which might tend to lessen the rigidity of the door as compared with one having few if any such openings therethrough, will still be extremely rigid and form-retaining and sufficiently sturdy to easily withstand the use to which it may be put, and will effectively combat any tendency for it to warp, twist, buckle or otherwise get out of shape or alignment.

I claim:

1. A door comprising a sheet metal panel having hollow tubular side bounding edges formed integrally therefrom, and an approximately channel-shaped cross-section cap closed at both ends and extending across each end of said door and slidably superimposed on

said tubular portions, the opposed flanges of said cap being substantially of equal length.

2. A door comprising a substantially planar sheet metal central panel and hollow tubular reinforcing columns integral therewith and extending along the bounding sides of said panel, and sheet metal cap elements having spaced-apart side walls and end walls, at the ends of said door and slidably enclosing the panel and the columns thereat.

3. A door as set forth in claim 1, but further characterized in that said hollow tubular portions project beyond the plane of said panel.

4. A door comprising a planar central sheet metal panel, tubular columns formed integrally therewith at its bounding edges and having a portion substantially in the plane of the panel, and caps having spaced-apart side walls and end walls to define a rectangular opening and extended across the ends of said door and slidably closing the ends of said columns.

5. A door comprising a central sheet metal substantially planar panel having shoulders coextensive therewith and spaced inwardly of the side edges of the panel for approximately the thickness of the metal of said panel, the metal having a portion extended laterally outwardly of the panel beyond each of said shoulders, thence extended rearwardly of said panel, thence extended inwardly and substantially parallel to said outwardly extended portions, thence extended forwardly to abut said sheet and have its rearmost face substantially flush with the rear face of said panel to thereby form a tubular column, and thence extended inwardly to-

ward said shoulder to superimpose on said sheet parallel therewith and having a terminal edge adjacent the shoulder, and a cap closed at its ends and along its top, front and rear sides and arranged at each end of the door and slidably enclosing the adjacent ends of said columns.

6. A door as set forth in claim 5, but further characterized in that the shoulders are of depth approximately equal to the sheet thickness and that the distance between the shoulders and the adjacent free edge of the column is greater than the perimeter of the column.

7. A sheet metal door comprising a central planar panel having a pair of opposed offset bounding edge portions coextensive therewith and the depth of the offset being approximately equal to the thickness of the sheet, and a substantially rectangular hollow reinforcing column formed integrally from each offset portion and having a reentrant terminal edge extending toward said panel and superimposed on and secured to an offset portion, and a box-like cap receptacle closed at its ends and at its top, front and rear sides and extending across each end of the door and superimposed on and receiving the end of the panel and its columns.

References Cited in the file of this patent

UNITED STATES PATENTS

1,044,047	Hess	Nov. 12, 1912
1,195,505	Saino	Aug. 22, 1916
2,582,467	Sylvan	Jan. 15, 1952