No. 838,672. PATENTED DEC. 18, 1906.

J. TYRA.

SHEET METAL DOOR.

APPLICATION FILED MAR. 10, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

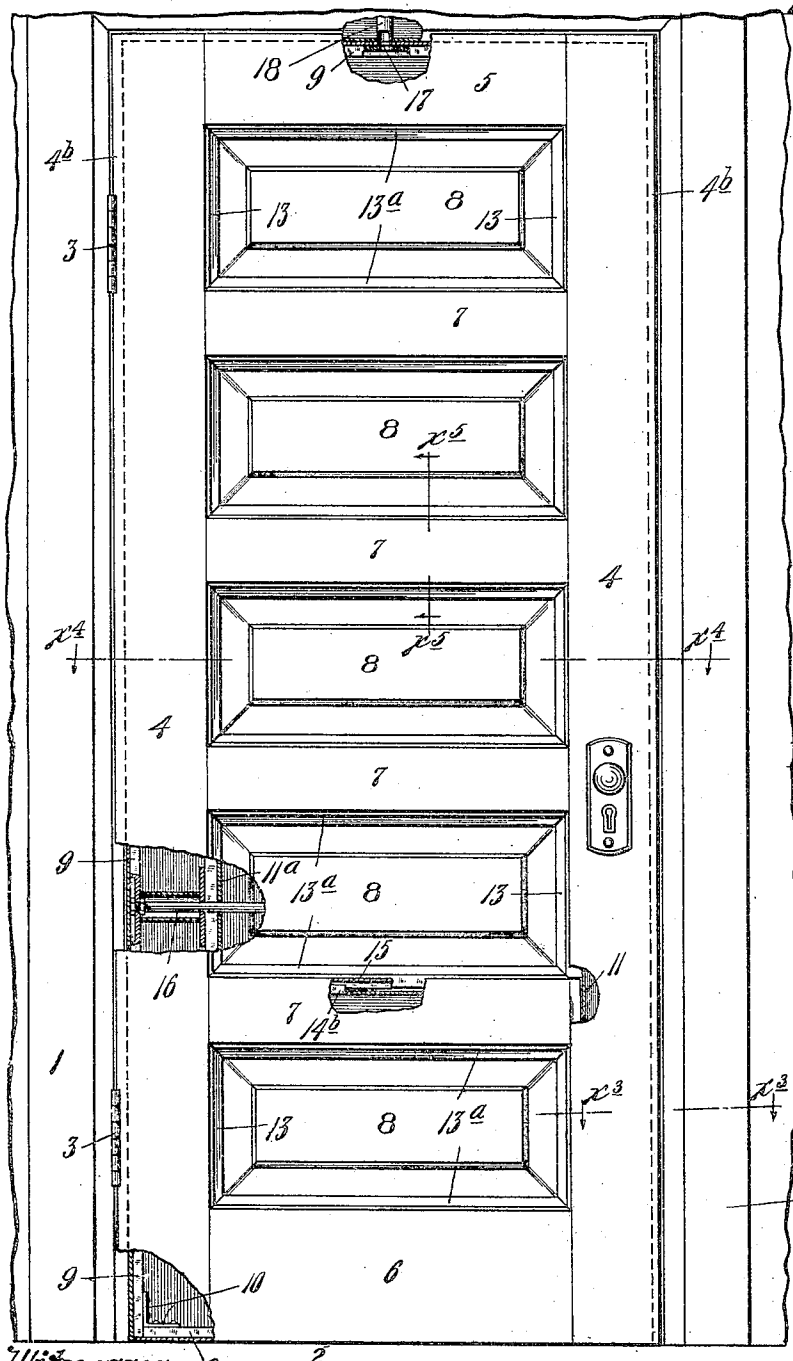


Fig. 2.

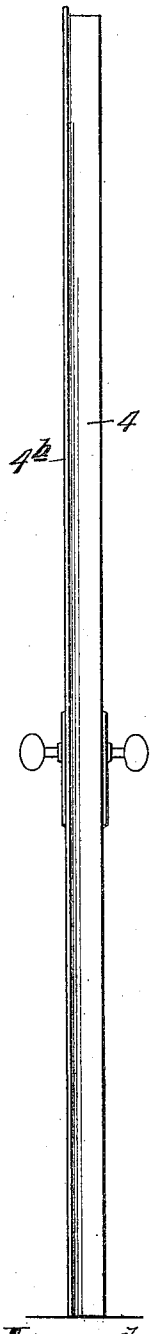
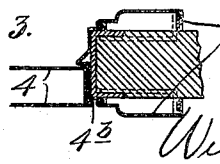


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4

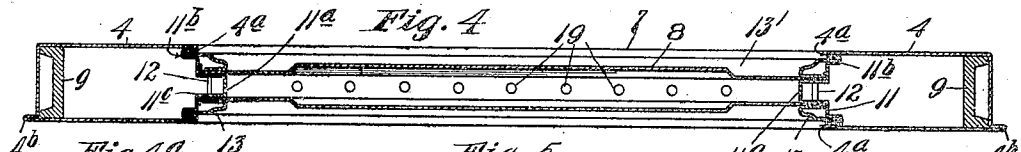


Fig. 4a

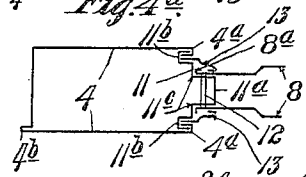


Fig. 5.

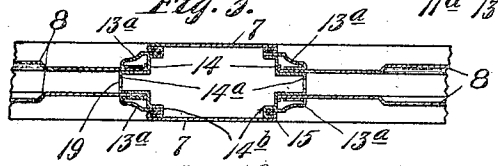


Fig. 6.

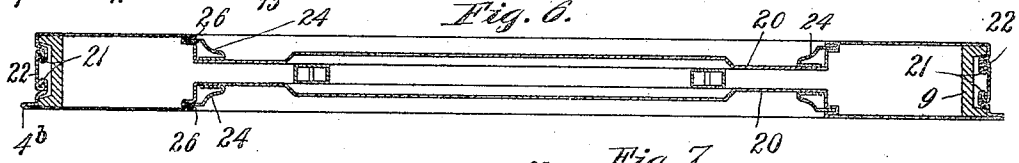


Fig. 7.

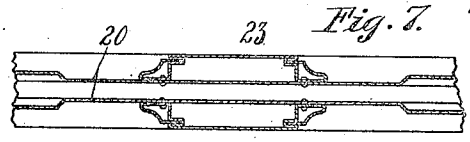


Fig. 8.

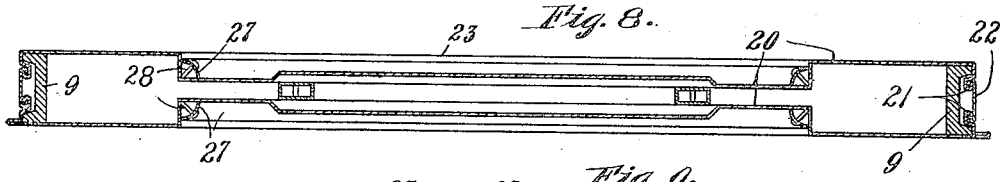


Fig. 9.

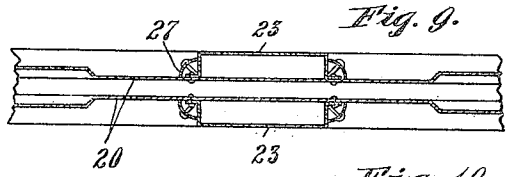


Fig. 10.

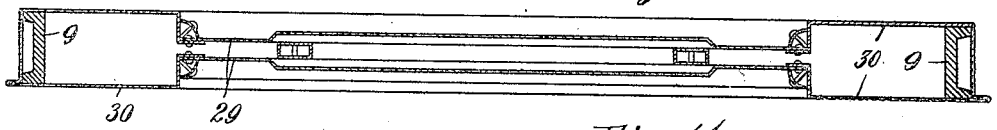
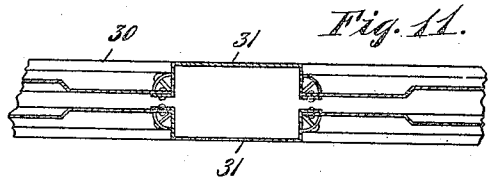


Fig. 11.



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JOSEPH TYRA, OF MINNEAPOLIS, MINNESOTA.

SHEET-METAL DOOR.

No. 838,672. Specification of Letters Patent. Patented Dec. 18, 1906.

Application filed March 10, 1906. Serial No. 305,268.

To all whom it may concern:

Be it known that I, JOSEPH TYRA, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Sheet-Metal Doors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention has for its especial object to provide a sheet-metal door of improved construction; and to this end it consists of the novel devices and combinations of devices hereinafter described, and defined in the claim.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in elevation, showing a door designed in accordance with my invention and showing also a door-frame in which the door is mounted. Fig. 2 is an edge elevation of the improved door. Fig. 3 is a detail in horizontal section, taken on the line x^3 x^3 of Fig. 1. Fig. 4 is a horizontal section through the door on the line x^4 x^4 of Fig. 1. Fig. 4^a is a diagrammatic section through a po tion of the door, also taken on the line x^4 x^4 of Fig. 1. Fig. 5 is a vertical section taken on the line x^5 x^5 of Fig. 1. Fig. 6 is a view corresponding to Fig. 4, but illustrating a modified construction. Fig. 7 is a view corresponding to Fig. 5, but illustrating the same door construction as illustrated in Fig. 6. Fig. 8 is another view corresponding to Fig. 4, but illustrating another modified construction. Fig. 9 is a view also corresponding to Fig. 5, but illustrating the same door construction that is shown in Fig. 8. Fig. 10 is still another view corresponding to Fig. 4, but illustrating another modified construction; and Fig. 11 is another view corresponding to Fig. 5, but illustrating the same door construction that is shown in Fig. 10.

The numeral 1 indicates a door-frame which, as shown, is of metal construction, but which forms no part of my present invention, and hence need not be considered in detail. The door 2 is supported from the frame 1 in the usual or any suitable way by means of hinges 3.

The door construction illustrated in Figs. 1 to 5, inclusive, will be first considered. This door is made up of vertical stiles 4, upper and lower and intermediate stiles 5, 6, and 7, respectively, and panels 8. The vertical and upper and lower stiles are formed around and directly secured to a rectangular marginal frame 9, shown as made up of channel-bars connected at their ends by corner-brackets 10, the latter being best shown in Fig. 1. In this preferred form each vertical stile 4 is made from a single piece of sheet metal bent into channel form and having at its edges backwardly-folded flanges 4^a. (Best shown in Fig. 4^a.) At one of its outer vertical corners each vertical stile 4 is formed with a projecting fold 4^b, that overlaps the door-casing and forms a close joint therewith. The open inner sides or edges of the vertical stiles 4 are closed by filling-plates 11 of complex channel form, being bent to form vertically-extended intermediate spacing-ribs 11^a and being formed at its vertical outer edges with approximately U-shaped folds 11^b, that receive and interlock with the folds 4^a of the stiles 4. The panels 8 at their four edges are formed with ou turned flanges 8^a. The vertical end flanges 8^a of the panels 8 rest in the angles 11^c, formed in the filling-plates 11, adjacent to the spacing-ribs 11^a thereof. Bolts or rivets 12 are passed through the ends of the panels 8 and through the sides of the spacing-rib 11^a of the filling-plate 11. Metallic moldings 13, bent from sheet metal, cover the heads and nuts of the bolts 12 and are secured in position by having their outer edges tightly pressed into the U-shaped folds 11^b of the filling-plates 11 and against the backturned edges of the stiles 4. If desired, solder may be applied at desirable points to more securely hold the moldings 13 in position.

The U-shaped folds 11^b of the vertical stiles 4 run from top to the bottom of the door, and the ends of the top, bottom, and intermediate stiles 5, 6, and 7, respectively, are forced into said folds and interlocked therewith, and, if desired, solder may be applied to the joints to more rigidly secure the parts together. The joints between the horizontal edges of the panels 8 and the corresponding edges of the stiles 5, 6, and 7 are the same as those between the ends of the panels and the vertical stiles, this construction being shown in Fig. 5. The same kind of filling-

plates as the plates 11 are employed; but in these instances they are shorter and of course are horizontally disposed. Said short filling-plates are indicated by the numeral 14, their spacing-ribs are indicated at 14^a, and their U-shaped edge folds are indicated at 14^b. The edges of the said horizontally-extended stiles are provided with lock-folds 15, which, like the folds 4^a of the vertical stiles, interlock with the U-shaped folds of the coöperating spacing-plates. The horizontally-extended moldings 13^a are inserted into the folds 14^b, as shown in Fig. 5.

To rigidly secure the parts of the door and to reinforce and brace the same, one or more tie-rods 16 are passed transversely through the door and are bolted or otherwise rigidly secured to the vertical members of the reinforcing-frame 9.

A metal door is of course fireproof; but to adapt the door to withstand very great heat without damage to the door and to make the door a positive barrier to the spread of fire through the doorway, I provide means for filling the door with water when desired. To this end a water-inlet port 17 is formed in one edge of the door, preferably as shown in Fig. 1, in the upper edge thereof, and this port is arranged to register with a water-supply pipe 18 when the door is closed. This water-supply pipe 18 extends through the upper portion of the door-frame and terminates in close proximity to the upper edge of the door, so that water will be delivered into the door through the port 17. There will be sufficient leakage between the joints of the door to permit the escape of air when the door is being filled with water, and this same leakage will permit the escape of steam, and thus prevent the door from being blown when subjected to great heat. To permit free circulation of water into the spaces between the panels 8, the spacing-ribs 14^a of the spacing-plates 14 are preferably provided with perforations 19.

In the modification shown in Figs. 6 to 9, inclusive, each side of the door, including panel and stile portions, are made or stamped from single plates 20, which are secured to the rectangular frame 9 and at their four marginal edges are formed with inwardly-extended portions that terminate in U-shaped lock-folds 21. The opposing reversely-bent lock-folds 21 are engaged and are interlocked with lock-strips 22, having folded edges that are engaged within the folds 21 by sliding movements. As shown in Figs. 7 and 9, the intermediate stiles 23 are riveted to the main plates 20.

In the construction illustrated in Figs. 6 and 7 the moldings 24 surrounding the panels are fitted into U-shaped loops 25 and 26, formed, respectively, in the stiles 23 and in the vertical stile forming portions of the plates 20.

In the construction illustrated in Figs. 8 and 9 the moldings are formed by metallic strips 27, that are slightly curved in cross-section and are secured to the plates 20 by bolts or screws 28.

The construction illustrated in Figs. 10 and 11 is very much the same as that illustrated in Figs. 8 and 9; but in this construction the lock-strips 22 are dispensed with. The sides of the door are made up of panel-forming sections 29 and stile-forming sections 30 and 31, which parts are preferably secured together by rivets.

In some instances I propose to fill the cavities or space within the metal door with asbestos-wool.

The invention, while primarily designed as an improvement in metal doors, is capable of incorporation in paneled walls and sectional partitions, and hence it will be understood that the claim of this application is intended to cover such application of the invention and that all thereof are included within the term "door," as broadly used in the said claim.

What I claim is—

In a sheet-metal door, the combination with the vertical stile-plates 4 having the folded edges 4^a, and the filling-plates 11 bent to form the intermediate spacing-ribs 11^a and U-shaped marginal folds 11^b, said folds 11^b receiving the folded edges 4^a of said stile-plates 4, of the upper, lower and intermediate stile-forming plates 5, 6 and 7, respectively, having the folded edges 15, the horizontal filling-plates 14 bent to form the intermediate spacing-ribs 14^a and U-shaped folds 14^b, said folds 14^b receiving folded edges 15, the panel-forming sections 8 having the marginal flanges 8^a, said plates 8 being spaced apart by said spacing-ribs 11^a and 14^a, and the molding-strips 13 also fitting in the said U-shaped folds 11^b and 14^b of said filling-plates 11 and 14 respectively, said molding-strips serving to cover bolts or rivets which hold panel-plates 8 in position, substantially as described.

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

JOSEPH TYRA.

Witnesses:

MALIE HOEL,

F. D. MERCHANT.