A. BLAUVELT.

FIRE DOOR.

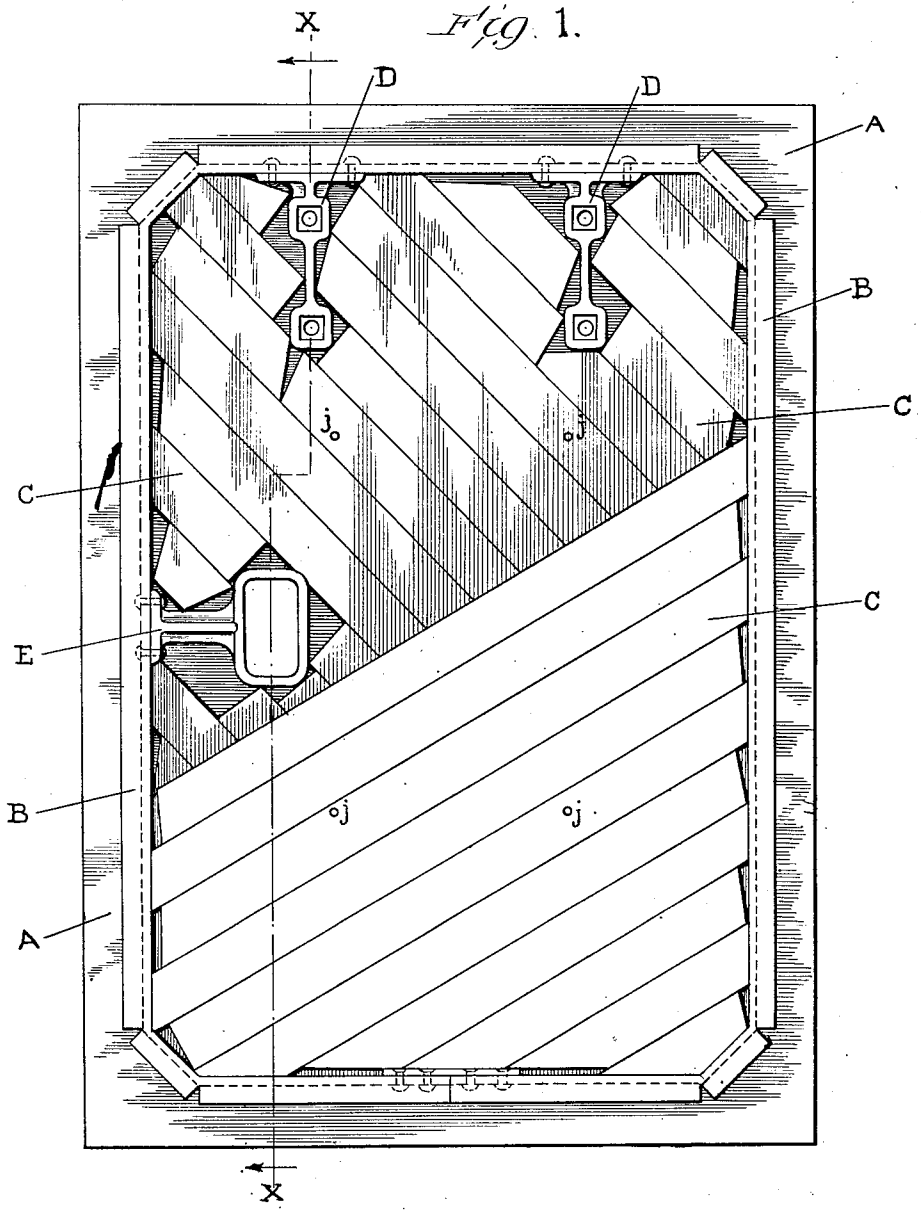
APPLICATION FILED OCT. 23, 1906.

1,033,376.

Patented July 23, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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2 SHEETS—SHEET 2.

Fig. 2.

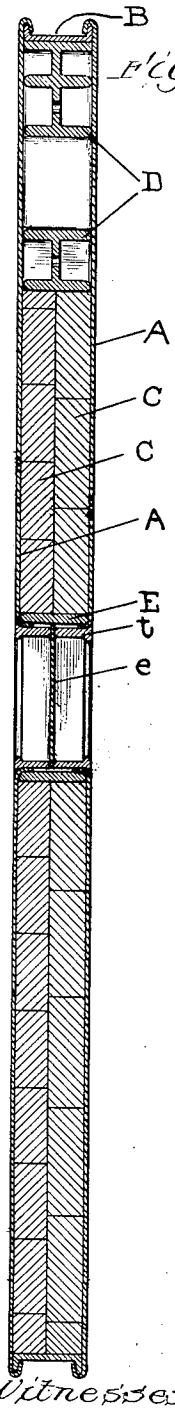


Fig. 10.

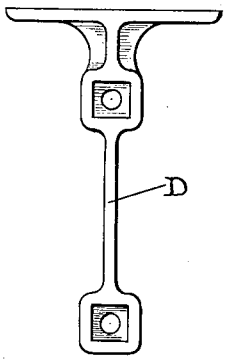


Fig. 11.

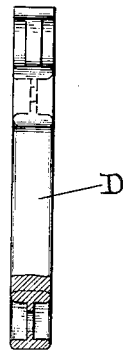


Fig. 6.

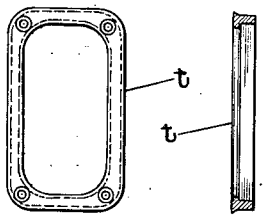


Fig. 7.

Fig. 8.

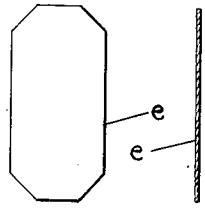


Fig. 9.

Fig. 3.

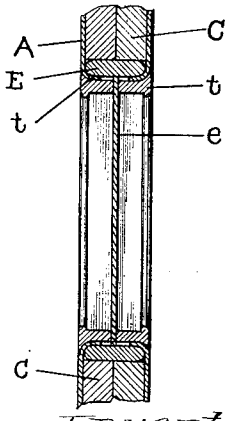


Fig. 4.

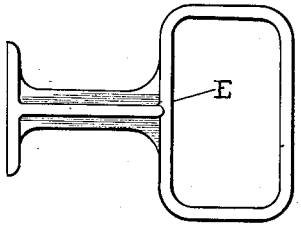
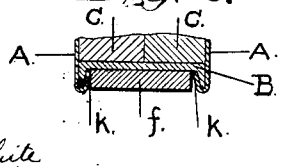


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT BLAUVELT, OF CHICAGO, ILLINOIS.

FIRE-DOOR.

1,033,376. Specification of Letters Patent. Patented July 23, 1912.

Application filed October 23, 1906. Serial No. 340,193.

To all whom it may concern:

Be it known that I, ALBERT BLAUVELT, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Fire-Doors, of which the following is a specification.

My invention relates to fire doors and the like and the object is to provide an improved and efficient door of this character possessing many features of advantage and utility over the ordinary fire door, which is made of wood sheathed with tin.

The ordinary fire door, is subject to many objections in practical use, not only in respect to the considerable expense thereof when properly made, but also in respect to complete efficiency owing principally to the buckling, warping or bursting of the tin when exposed to great and continued heat and also owing to the burning of the wood around the numerous nails employed to secure the tin to the wood. Such ordinary fire door has other disadvantages in respect to the hardware thereof, with the result that the door is either a right hand door or a left hand door, as the case may be, and cannot be used interchangeably for either situation.

My novel form and construction of door is designed to overcome all of the objections noted and to embody advantages not attainable in the ordinary fire door, all as will be hereinafter made apparent.

In the drawing Figure 1 is an elevation of my improved fire door illustrating one stage in the process of manufacture; Fig. 2 a vertical section of the complete door, the line of the section being indicated by the section line X—X of Fig. 1; Fig. 3 a detailed sectional view of that part of the fire door adjacent the hand-hold, such section being on a somewhat larger scale than that of Fig. 2; Fig. 4 an elevation of a part of the hardware forming the hand-hold; Fig. 5 a detailed view illustrating a binder strap *f* which may be employed for binding or securing the inturned edges of the sheet metal A which forms covers for the non-conducting interior of the door; Figs. 6 and 7 are detailed views of the hand-hold binders; Figs. 8 and 9 detailed views of the hand-hold center and Figs. 10 and 11 detailed views of the hardware forming the hanger bolt-sockets.

Referring to the embodiment of my invention as herein shown and described, the same comprises essentially the two opposite sheets of metal A, a metal frame B and the filling or wooden frame C. The metal sheets A are of any desired thickness and of suitable dimensions but rather larger than the metal frame, as illustrated in Fig. 1, in order that the same may be trimmed and turned over and interlock with such metal frame in the manner hereinafter more particularly described. This metal frame is formed of channel iron shaped to the form of the door, to which end the corners are notched as shown in Fig. 1. In practice and by preference the flanges of the channel iron are outwardly directed, with the result that the flanges form a medium for the connection or anchoring of the edges of the metal sheets of plates A. As is clearly indicated in Figs. 2 and 5, the edges of the sheets are merely turned or rolled over the flanges with the result that the expansion and contraction of the metal sheets are provided for, sufficient latitude being provided by the flanges to permit the metal sheets to expand considerably without becoming disconnected from the frame. By preference, as shown in Fig. 5, I arrange in the groove formed between the channel flanges and binder strap *f* which holds the inturned edges of the metal sheets in place without, however, interfering with the desired freedom thereof in the expansion and contraction of such sheets. It will be understood, however, that such a strap is not essential but may be dispensed with, as illustrated in Fig. 2.

The filling provided within the metal frame may be of any suitable character, but I prefer to employ cross laid wooden boards or strips as illustrated in Figs. 1 and 2 and I will now proceed to describe a filling of this character as used in practice. As illustrated in Fig. 1, the boards or strips are arranged in two separate layers crosswise of each other with the boards laid diagonally and butted right and left against the inner surface of the metal frame. It is desirable that at least one of the ends of each board be cut or finished so as to fit squarely against the surface of the metal frame adjacent thereto, which will give sufficient support and bracing effect to the metal frame, particularly when the wood filling is all connected together and cemented in the manner hereinafter explained. Each strip extending across the metal frame, instead

of being a single piece as shown in the first layer illustrated in Fig. 1 may be built up or formed of a series of small pieces of wood as may be desired or preferred for economical reasons or otherwise. However, at those points where the hardware is inserted the strips are pieced out as illustrated in Fig. 1. It will be found sufficient, as shown in the present instance, to employ only two layers or plies of wooden strips or boards, but it will be understood that any number of plies may be used. The layers of boards or strips may be secured together in any suitable manner, but I prefer to secure or cement them together by means of a fire-resistive cement, although of course nails could be used. However, the cement is preferable inasmuch as it does not burn holes like the nails when hot, and moreover more or less fire-proofs the wood. The cement which I prefer to employ is one composed of silicate of quartz, black oxid manganese and any third fire-resistive body, such as sand, clay, ocher, metallic oxid, magnesia, mica or the like. By preference I employ a few stay bolts or rivets such as the bolts *j* illustrated in Fig. 1, in addition to cementing the layers together.

Referring next to the hardware of the door, I secure to the inner surface of the metal frame B a hand-hold frame or socket E which has a socket portion substantially corresponding to the hand-hold opening to be provided for in the door. At points registering with such hand-hold socket the two opposite metal sheets A are cut out as seen in Figs. 2 and 3 and the edges thereof are rolled over upon the inner side of the hand-hold socket E. A hand-hold partition or center *e* is now arranged in the hand-hold to form separate hand-holds on opposite sides of the door and to maintain such partition in place I provide the binders *t* which are secured in place and in position to hold or bind the partition between them as clearly shown in Figs. 2 and 3.

The hardware for the door hangers consists of bars secured to and depending from the upper cross-portion of the metal frame B and provided with hanger-bolt sockets, it being understood that the metal sheets A are provided with bolt holes at points corresponding to the sockets of the bars D. It is obvious my fire door is adapted to be used either as a right hand or left hand door, inasmuch as the door hangers may be bolted either to one side or the other of the door, as may be required for the particular situation or use. It will thus be seen that all of the hardware is arranged inside of the lines of the door and that moreover the hand-hold is made flush with the door surface.

It will be understood from the foregoing that my new form of door can be made most economically as compared with its durability and efficiency in actual use and that the same moreover overcomes many of the objections which are well-known in the use of the ordinary fire door, inasmuch as the door is made rigid but with capability of expansion and contraction, particularly as to the metal sheets which are directly exposed to the heat of a fire and inasmuch as also the use of nails for securing the metal sheets in place is wholly dispensed with. Furthermore, the employment of the cement referred to not only serves to bind the parts of the filling together but also renders them more or less fire-proof.

I claim:

1. A fire door comprising a metallic frame, a filling therein, and metal sheets arranged on opposite sides of the frame and interlocked therewith, said plates and frame having an interlocking sliding engagement to provide for contraction and expansion.

2. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling within the frame, and metal sheets arranged on opposite sides of said filling and having an interlocking sliding engagement with the frame sufficiently free to provide for contraction and expansion.

3. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling within the frame, and metal sheets arranged on opposite sides of said filling and having an interlocking sliding engagement with the flanges of the channel iron sufficiently free therefrom to provide for contraction and expansion.

4. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door with the channel iron flanges outwardly directed, a filling within the frame, metal sheets on opposite sides of the frame and interlocked over the channel iron flanges to permit the contraction and expansion, and a binder strap extending around the metallic frame between the flanges of the channel, said strap being arranged to leave a space on each side between itself and the adjacent flange to permit free movement therein of the interlocking portion of the adjacent metal plate.

5. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling therein consisting of a plurality of layers or plies of strips or boards, the members of each layer being butted alternately right and left against the frame, and metal sheets on opposite sides of the frame.

6. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling therein, metal sheets on opposite sides of the frame, and handhold hardware embedded in the filling

and within the confines of the door and interlocked with said metal sheets.

7. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling therein, metal sheets on opposite sides of the frame, a hand-hold socket E interlocked with the metal sheets and arranged within the filling, and a partition *e* therein.

8. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling therein, metal sheets on opposite sides of the frame, a hand-hold socket E secured to the frame and arranged within the filling, a partition *e* therein and binders for holding such partition in position.

9. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door, a filling therein, metal sheets on opposite sides of the frame, and hanger-bolt sockets D secured to the frame and arranged within the filling.

10. A fire door comprising a metallic frame, a filling within the frame, metal sheets on opposite sides of the frame, a hand-hold socket E arranged in an opening in the metal sheets and filling, the edges of such opening in the metal sheets being turned over the edges of the socket, and binders *t* arranged in said socket and clamping the turned over edges of said metal sheets.

11. A fire door comprising a metallic frame, a filling within the frame, metal sheets on opposite sides of the frame, a hand-hold socket E arranged in an opening in the metal sheets and filling, the edges of such opening in the metal sheets being turned over the edges of the socket, a partition *e* in said socket, and binders *t* arranged in said socket for binding said partition in place and clamping the turned over edges of said metal sheets.

12. A fire door comprising a metallic frame consisting of channel iron shaped to the form of the door with the channel iron flanges outwardly directed, metal sheets arranged on opposite sides of the frame and having an interlocking sliding engagement with the flanges of the channel iron to provide for contraction and expansion.

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