E. D. FITZPATRICK.

SHEET METAL DOOR.

APPLICATION FILED DEC. 2, 1916.

1,283,131.

Patented Oct. 29, 1918.

Fig. 1

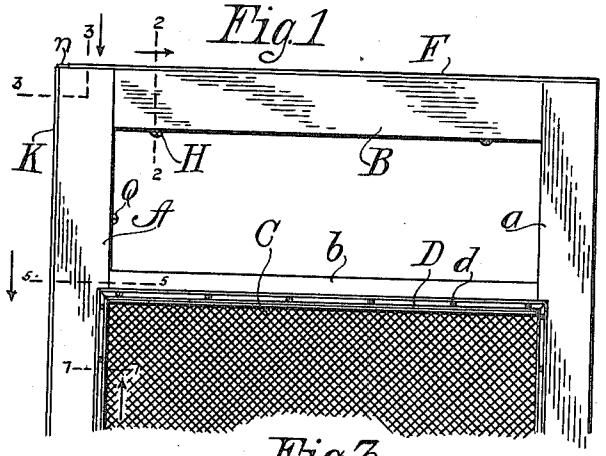


Fig. 2

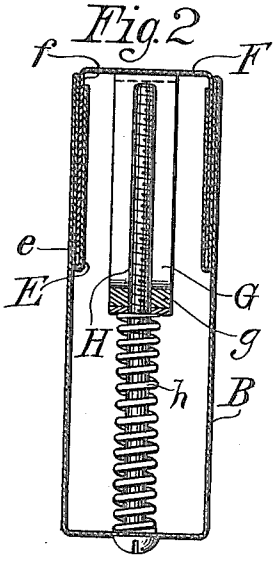


Fig. 3



Fig. 4

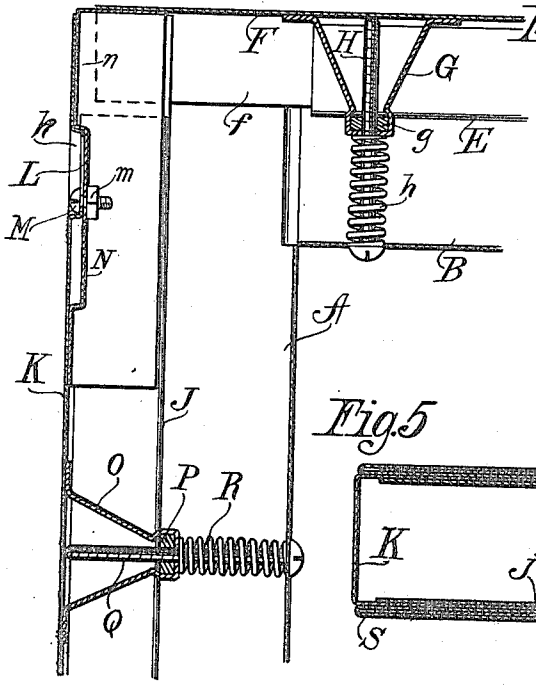


Fig. 7

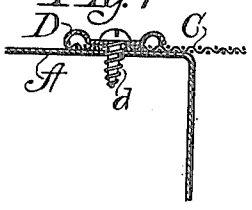


Fig. 6

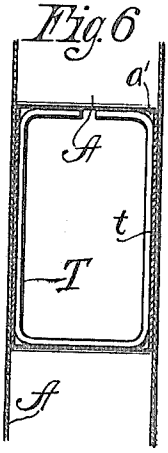
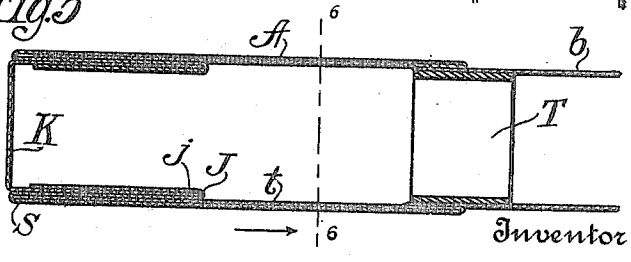


Fig. 5



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SHEET-METAL DOOR.

1,283,131. Specification of Letters Patent. Patented Oct. 29, 1918.

Application filed December 2, 1916. Serial No. 134,596.

To all whom it may concern:

Be it known that I, EDWARD D. FITZPATRICK, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Sheet-Metal Doors, of which the following is a specification.

This invention relates to sheet metal doors, and has for its object the production of a door of corresponding general structure, and which is believed to be an improvement upon the sheet metal door set forth in Letters Patent of the United States numbered 1,148,304, issued to this applicant July 27, 1916. The further object in this invention being the production of a door having parts of special construction and arrangement whereby it is thought the same strength and durability is attained and maintained as in the invention covered by the said patent, while the cost of manufacture is materially decreased and rendered more convenient.

Of the drawings forming a part of this application and illustrating the construction and arrangement of the various parts, Figure 1 represents the side view of the upper portion of a screen door fashioned in accordance with this invention. Fig. 2 is a vertical section of the top rail, full size, on the broken line 2—2 of Fig. 1. Fig. 3 is a partial horizontal section of the upper left hand corner of the door, full size, on the indirect broken line 3—3 of Fig. 1. Fig. 4 is a vertical section of the junction of the front stile and top rail, about half size, on broken line 4—4 of Fig. 3. Fig. 5 is a horizontal section of the front stile, and a portion of the intermediate rail or bar at their junction, full size, on the broken line 5—5 of Fig. 1. Fig. 6 is a vertical section, full size, of a portion of the front stile, on broken line 6—6 of Fig. 5, showing the stiffening or reinforcing frame at the junction of the stile and intermediate rail. Fig. 7 is a fragmentary cross-section of the stile on line 7—7 of Fig. 1 and shows the mode of securing the screen upon the door by means of metal strips and screws.

Throughout the drawings and description, the same letter is used to refer to the same part.

Considering the drawings, the front stile A and the top rail B are U-shaped sheet metal members arranged with their edges outwardly.

There is provided the intermediate rail or bar *b*, and the customary wire net screen C is secured to the stile and bar by means of the beaded strip D, through which passes the screw *d*. In practice, the hole for the screw through the strip D freely permits the screw to pass, but the hole for the screw in the stile A is smaller than the screw. When the screen C is to be secured, its edge portion is placed between the strip D and the surface of the stile A. The screw is pressed through the wire net until its point enters the restricted screw hole in the stile. By means of a driver the screw is then forced into the stile, and the operation distorts the edges of the smaller hole in the stile, causing them to engage the threads of the screw and to hold the screw firmly. In Fig. 7 it will be noted that the screw *d* is provided with threads entirely up to its head.

As best shown in Fig. 2, the edge portion E of the rail B is bent upon itself first inwardly against the inside of the rail, and then outwardly, leaving a narrow channel *e* as shown. The office of the channel *e* is to hold and guide the extension piece F, and the legs of the extension piece, such as the leg *f* engage the channels *e*. As ordinarily constructed, the means for adjusting the extension piece F parallel with the rail B, for the purpose of increasing or decreasing the length of the door, comprise the forked hanger G attached to the extension piece on the inside, and carrying a nut *g*. From the exterior below the rail B a bolt H passes in upwardly and engages the nut *g*. Between the fork or hanger G and the bottom of the interior of the rail B a spiral spring *h* encircles the bolt H. When the parts are in the positions illustrated in Fig. 2, the spring *h* is compressed, and the screw is so threaded that, when it is turned in the customary direction, that is to say, with the hands of a watch, it permits the spring *h* to extend itself and the extension strip is pushed outwardly from the position shown. If the screw be turned in the contrary manner, the extension piece is drawn inwardly toward the rail B. It will be understood that there are two or more of the groups comprising the hanger, nut, bolt and

spring, in order that the relatively long extension piece may be evenly moved parallel with the rail B.

As best shown in Fig. 5, the edge portion J of the stile A is first turned inwardly against the interior of the stile, and then outwardly leaving the narrow channel *j*, similar to the channel *e* already described, and the channels *j* at the sides of the stile A engage the sides of the extension piece K. The turning inwardly and outwardly of the outwardly disposed edges of the stile A and rail B to form the channels *j* and *e*, adds materially to the rigidity of the framework of the door. It was found in practice that where the outer edges of stile and rail were but the edges of single thicknesses of the relatively thin metal sheets, as shown in Letters Patent of the United States, No. 1,148,304, issued to me July 27, 1915, the repeated slamming of the door in service seriously dented and distorted those parts. By means of a group of parts comprising the forked hanger O, nut, P, bolt Q, and spiral spring R, all of the same construction as the like parts previously mentioned for rail B, the extension piece K is moved out or in parallel with the stile A, and the door made wider or narrower correspondingly. The adjusting members just mentioned as applying to the extension piece K, are best illustrated in Fig. 4. Also in Fig. 4 it is shown that the extension piece K has near its top end a longitudinal depression or recess *k*, through the bottom of which is a slot L extending lengthwise. Through the slot L a screw M passes inwardly, and by means of a nut *m*, the screw is clamped in position to hold together the bottom of the longitudinal depression or groove N, through which the screw also passes, and the depression *k* already described as a part of the extension piece K. The depression or groove N is formed in the external surface of the U-shaped sheet metal corner-filling member *n*, one end, the upper end, of which is closed as illustrated in Fig. 4. If the screw M and nut *m* be loosened, the corner-filling member *n* may be adjusted for a distance lengthwise with respect to the extension strip K, to fill out the corner of the door after the adjustment of the extension pieces. It will be understood that when the extension piece F is moved outwardly with respect to the rail B, and the extension strip K is moved outwardly with respect to the stile A, at the upper left hand corner of the door there remains a small rectangular space unoccupied. It is the purpose of the corner-filling member *n* to take up this space when moved as explained, and the screw M and nut *m* fix it in place after adjustment, by clamping the corner-filling member to the extension piece K by which it is carried.

For additional strength, this invention is provided with an intermediate rail or bar *b*, and when the edge portion J of the stile A is bent first inwardly as explained, it is customary to leave a narrow space or channel S into which the sides *t* of the rail *b* may be extended, as shown in Fig. 5. The construction adds to the security of the junction between the rail *b* and the stile A. There is an opening *a'* made in the rear face of the stile, and the opening *a'* has about the area of the cross-section of the rail *b*, as shown in Fig. 6. By extending the sides *t* of the intermediate rail *b* tightly into the channels or spaces S at the sides of the stile A, the junction is stiffened as stated, and the rail *b* is held against displacement either up or down at the junction. The rail *b* may not move either out or in by reason of the fact that the stiles and top and bottom rails are fastened together in the construction. To render the junction of the intermediate rail *b* and the stile A more rigid, there is included the relatively thicker metal internal collar or frame T, and as best shown in Figs. 5 and 6, this frame is located across the junction of the stile and the rail.

In explaining the mode of the operation of this invention, it may be stated that the method of securing the screen C to the rails and stiles has been already described.

When it is desired to make the door longer, the bolt H is operated to permit the elongation of the spiral spring *h*, and the extension piece F is moved from the position shown in Fig. 2 and caused to project as far as may be desired beyond the top rail B. The corner-filling member *n* is adjusted lengthwise within the extension piece K as will be readily understood from the foregoing explanation. Should it be desired to widen the door, the bolt Q is turned to permit the spring R to expand, and the extension piece K moves outwardly parallel with and beyond the stile A to the predetermined extent. Again the corner-filling member is adjusted to fill out the corner space created by the movement of the extension pieces.

Having now described this invention and explained the mode of its operation, what I claim is:—

1. In a sheet metal door, the combination with a front stile and top rail each comprising U-shaped sheet metal body portions arranged with their edge portions outwardly, and the said edge portions being turned first inwardly against the inner surface of the said sheet metal body rendering the outer edge portion of the said body stiff, the remaining edge portions being turned outwardly and spaced from the inwardly-extending portions to form inner longitudinally disposed channels at the said outer edges of the said stile and rail, of U-shaped sheet metal extension pieces arranged with their sides in the said channels,

and means for bodily adjusting the said extension pieces parallel with the said stile and rail.

2. In a sheet metal door, the combination with a front stile and top rail each comprising U-shaped sheet metal body portions arranged with their edges outwardly and the said edges being turned first inwardly and then outwardly forming inner channels longitudinally disposed with respect to the said stile or rail, of U-shaped sheet metal extension pieces arranged with their sides in the said inner channels of the stile and rail, means for adjusting the extension pieces parallel with the said stile and rail, an intermediate rail comprising a sheet metal tube, the sides of the said tube passing into the said stile and arranged flatwise next to the sides thereof and extending between the said sides of the stile and the said inwardly turned edge portion thereof, and an internal stiffening frame arranged within the said tube and stile and across the junction of the said stile and the said intermediate rail.

In testimony whereof I affix my signature.

EDWARD D. FITZPATRICK.

Witnesses:

E. HAROLD SPORE,

DEE HARRISON.