R. W. E. BUTTLAR.

HOLLOW FIREPROOF PARTITION SLIDING DOOR FOR FIRE WALLS.

APPLICATION FILED NOV. 2, 1909.

983,681. Patented Feb. 7, 1911.

3 SHEETS—SHEET 1.

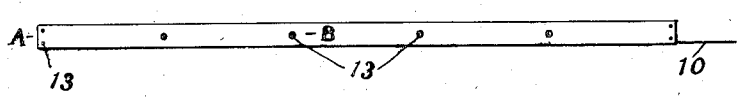


Fig. 5.

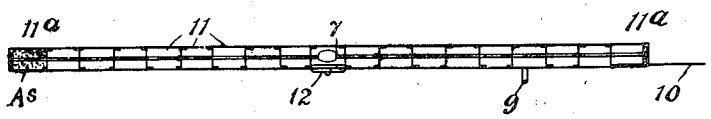


Fig. 4.

Fig. 3.

Fig. 1.

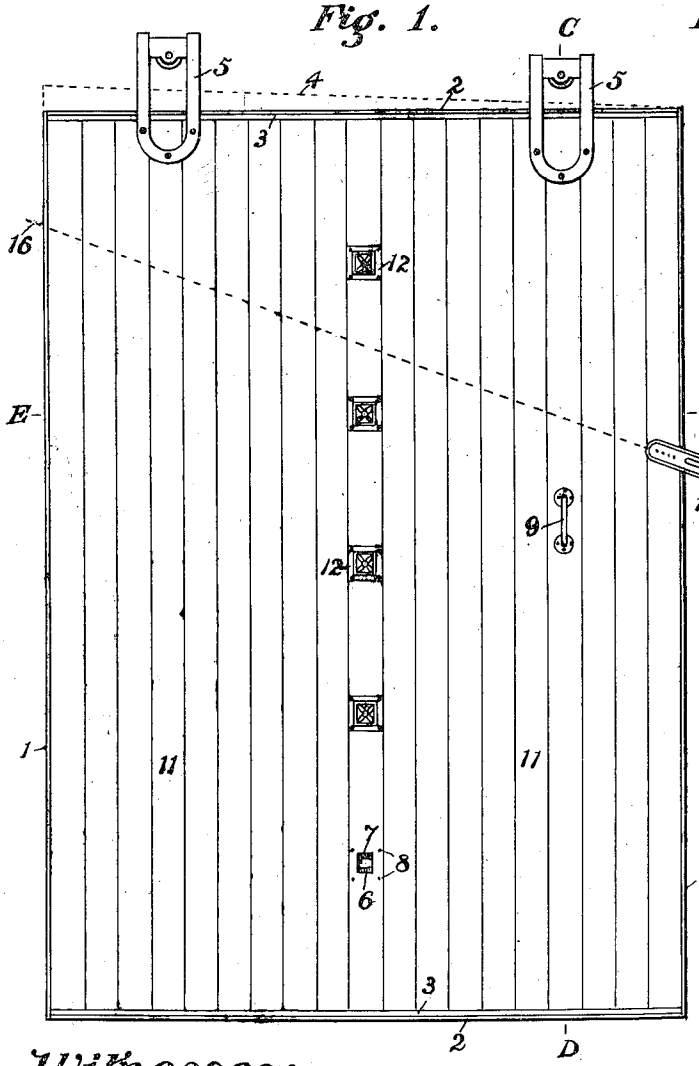
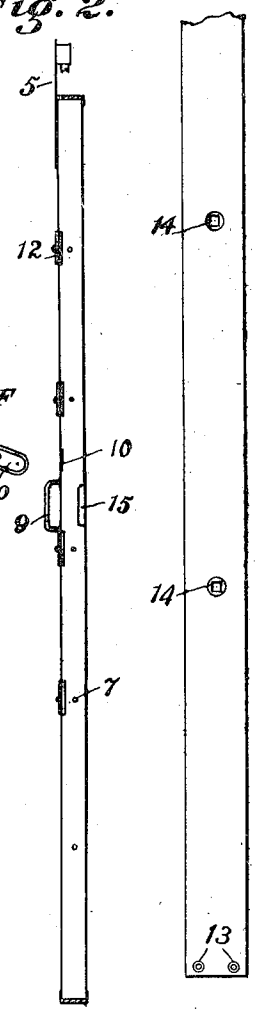


Fig. 2.



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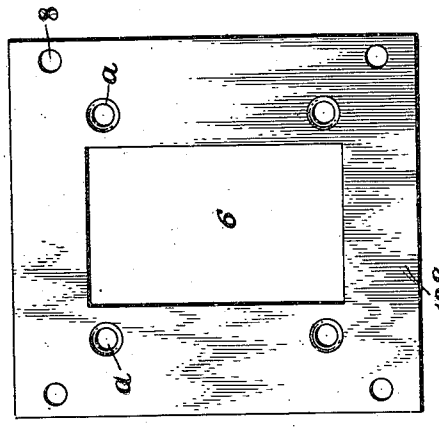

Fig. 7.

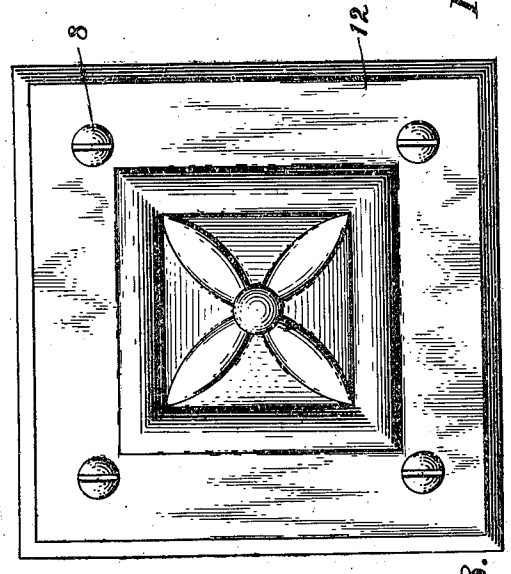

Fig. 8.

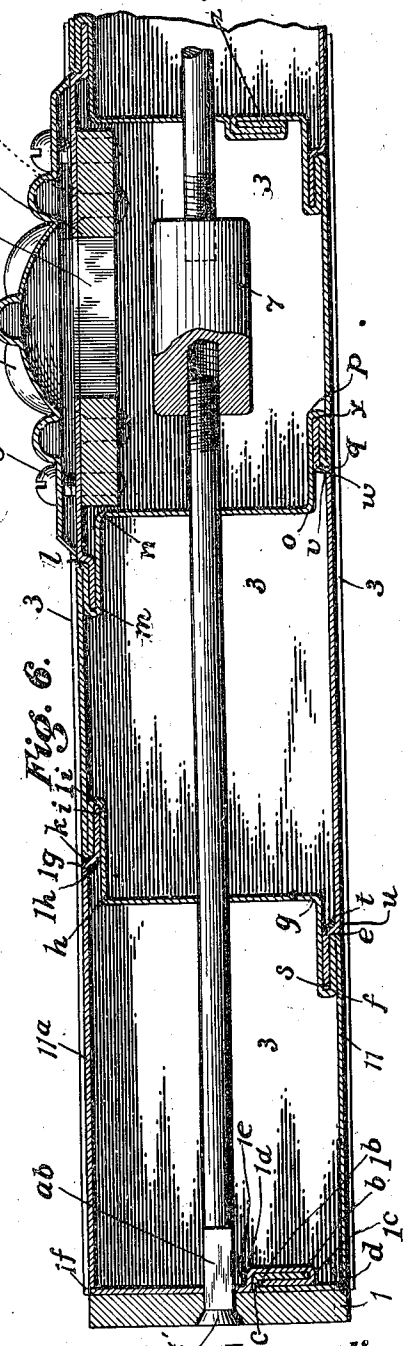

Fig. 6.

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3 SHEETS—SHEET 3.

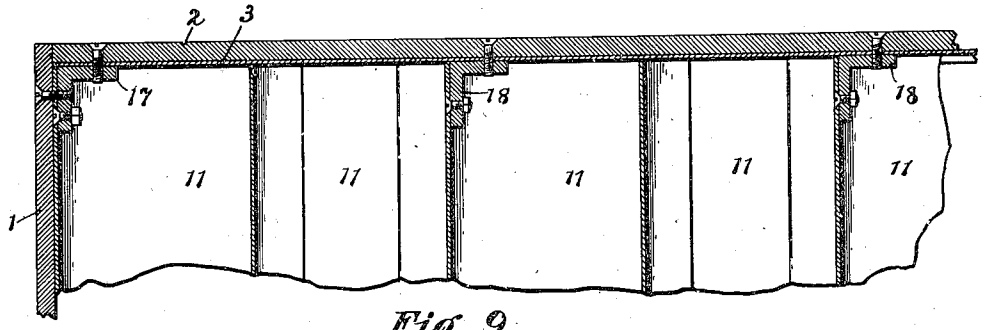


Fig. 9.

Fig. 10.

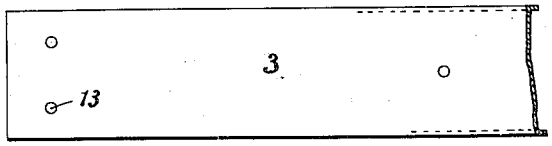
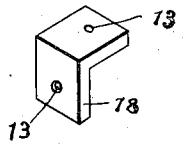


Fig. 13.



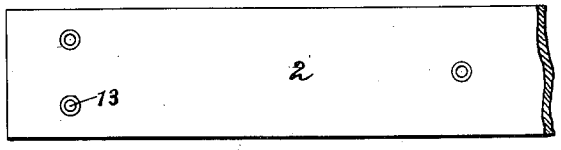
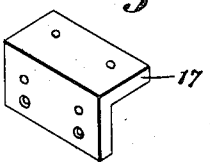


Fig. 11.

Fig. 12.



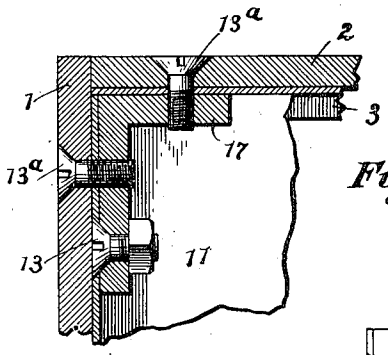
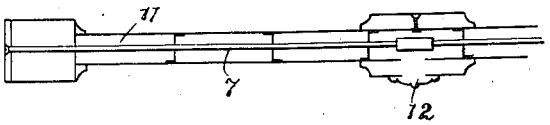


Fig. 14.

Fig. 15.



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UNITED STATES PATENT OFFICE.

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HOLLOW FIREPROOF PARTITION SLIDING DOOR FOR FIRE-WALLS.

983,681. Specification of Letters Patent. Patented Feb. 7, 1911.

Application filed November 2, 1909. Serial No. 525,937.

To all whom it may concern:

Be it known that I, RUDOLPH W. E. BUTTLAR, a citizen of the United States, residing at Columbus, in the State of Ohio, have invented a new Improvement in the Construction of Hollow Fireproof Partition Sliding Doors for Fire-Walls, of which the following is a specification.

The object of my invention is to manufacture a door wholly out of sheet metal, without the use of solder, which shall have sufficient stiffness and rigidity to stand up under any ordinary strain, but which will allow at the same time, considerable expansion and contraction. My door, which may be made of any desired thickness, width or height, may be constructed as cheaply as the old fashioned wooden fire doors, covered with tin which have heretofore been largely used and approved by the fire underwriters. My improved construction may be used equally well for shutters or panel doors. I attain these objects by the construction illustrated in the accompanying drawings, in which all like numbers, or combinations of letters and numbers, designate the same subject in all figures.

Figure 1 is a front elevation. Fig. 2 is a vertical section on the line C D of Fig. 1. Fig. 3 shows part of the side plate 1 of Fig. 1. Fig. 4 is a horizontal section on the line E F of Fig. 1. Fig. 5 is the top and bottom plate. Fig. 6 is a partial section on the line E F of Fig. 1. Fig 7 is the plate 12^a of Fig. 6. Fig. 8 is an ornamental plate which covers the plate 12^a of Fig. 6. Fig. 9 is a partial section on the line A B of Fig. 5. Fig. 10 is a part of the flanged sheet metal plate which covers the edges of the upright sections at the top and bottom. Fig. 11 is a larger view of part of the plate shown in Fig. 5. Fig. 12 and Fig. 13 are angle irons used to fasten the top and bottom plates to the upright sections, shown also in Fig. 9, by 17 and 18. Fig. 14 is a vertical section of a corner of the door. Fig. 15 shows the same method of construction applied to a panel door.

1 of Fig. 1 shows an iron plate on each edge of the door. 2 is a plate similar to 1 on the top and bottom of the door. 3 is a piece of sheet metal with its edge turned down to finish the rough edge of the main body at the top and bottom. 4, a dotted line, shows how the top can be cut on a slant if so desired. 5 shows a suitable hanger and rollers. 6 shows an opening in the connecting slide, so to reach to 7. 7 is a round or hexagonal right and left threaded nut and rods. 8 shows threaded holes by means of which an ornamental stamped plate 12 is bolted over the holes 6, after the rods have been tightened sufficiently. 9 shows a handle to open and close the door. 11 and 11^a show what I call connecting slides. 16 represents a rope to connect the fusible link and counterweight.

In Fig. 2, 5 shows a hanger and roller with an iron plate riveted on the inside of the body to bolt the hanger to. 10 is a fusible link. 15 shows a handle sunk in the opposite side, so as to leave one side of the door perfectly smooth to fit close against the fire-wall when open or closed.

In Fig. 3 may be seen square, countersunk holes 14, through which the rods 7 pass, and round countersunk holes 13, through which pass the bolts to hold the plate to the angle iron as shown in Fig. 14.

As in Fig. 4, represents asbestos packing, with which the door may be filled if desired, though this is not necessary.

Fig. 5 shows top and bottom plates with countersunk round holes 13, for bolts to pass through.

Fig. 4, shows 19 spaces in door, divided by partitions, this making an uneven number of spaces and so making one space and one connecting slide with its holes and plates in the center of the door.

Fig. 6 shows a partial section on line E F, Fig. 1, on a large scale to explain and show the construction of the spaces, of the main body and the connecting slides. The small letters in this figure designate the points where the sheet metal is to be bent, and I shall now proceed to describe in what way these distances from letter to letter are to be bent, until the width of the sheet metal is used up. *b*—*c* is turned in on *c*—*d*, allowing room for 1^b—1^c to slide between. *c*—*d* is turned in square to *d*—*e*. *e*—*f* is turned in tight on *e*—*d*. *f*—*g* is turned out on *e*—*f*, allowing room for *s*—*t* to slide in. *g*—*h* is turned in square to *f*—*g*. *h*—*i* is turned out square to *h*—*g*. *i*—*k* is turned in on *i*—*h* allowing room for 1^i to 1^h to slide in. *k*—*l* is turned out on *i*—*h* tight. *l*—*m* is turned

in on *l*—*k* tight. *m*—*n* is turned out on *l*—*m*, leaving room for another thickness of metal to slide between. *n*—*o* is turned in square to *m*—*n*. *o*—*p* is turned out square to *n*—*o*. *p*—*q* is turned out on *o*—*p*, leaving room for *w*—*x* to slide in. *q*—*r* is turned out tight on *q*—*p*. These operations are repeated until the desired width of the door is obtained.

z shows the method of connecting the sheet metal when 2, 3 or more sheets are necessary to finish door. 11^a represents the end connecting slide. 1^b, 1^c is turned out on 1^c—1^d leaving space for *b*—*c* to slide in. 1^d—1^e is turned out square to 1^a—1^c, forming a shoulder so *c* cannot slip out. 1^e—1^f is turned in square to 1^d—1^e. 1^f—1^g is turned in square to 1^e—1^f. 1^g—1^h is turned in square to 1^f—1^g, forming a shoulder against *k*. 1^h—1^i is turned out square to 1^g—1^h and slides in space left between *k*—*i* and *i*—*h*, in the same way 1^b—1^e slides in its proper place, and so 11^a finishes the two end spaces. 11 represents connecting slides on both sides of the door to finish and close the spaces. *s* to *t* is turned out square to *t*—*u* and slides between *f*—*e* and *f*—*g*. *t*—*u* is turned in square to *u*—*v*, forming a shoulder against *e*. *v*—*w* is turned in square to *u*—*w*, forming a shoulder against *q*. *w*—*x* is turned out square to *v*—*w* and slides in between *o*—*p* and *p*—*q*. The distances as 1^f to 1^g, *k* to *l*, *d* to *e*, *u* to *v*, etc., can be increased or reduced so to obtain the exact width of door or shutter required, likewise the distances *d* to 1^f, *h* to *g*, *n* to *o*, can be increased or reduced to gain the desired thickness of the door or shutter.

The third space in Fig. 6, shows the construction of the center space and connecting slides in which 7 shows a right and left threaded nut and rods. The rods pass through holes in the partitions as through *d*—*f*, *h*—*g*, *n*—*o*, etc. The rods have, on the end opposite the thread, a round flat head and next to it, a square shoulder to fit in square countersunk holes as shown in Figs. 2 and 3. These rods are placed as often as necessary and hold the main body, the connecting slides and outside plate together, and can be loosened and tightened by the nut 7 through the hole 6 in the connecting slide with common gas pliers, but should never be tightened too much so as to make allowance for expansion.

6 shows a hole in the connecting slide and inside plate shown by 12^a which is riveted on the connecting slide as shown by *a*.

Fig. 7 shows the same plate with *a*, the rivet holes, and 8, the bolt holes, to bolt the ornamental stamped plate to cover the hole 6 after the rods are tightened. All necessary fittings as hangers, rollers, handles, fusible link etc., are applied according to the same principle, a plate riveted on the inside of the body with threaded holes to bolt the fittings to.

Fig. 8 shows the ornamental stamped plate to cover hole 6 as mentioned before.

17 and 18 of Fig. 9 show angle irons, better shown, 17 in Fig. 12, and 18 in Fig. 13, with countersunk holes for rivets to fasten the iron on the partition and threaded holes to receive bolts. All the holes are marked 13 and correspond in all the figures.

Fig. 14 shows how 17 and 18 are either riveted or bolted on the partitions of the door or shutter, and the flanged sheet metal, Fig. 10, and the plate, Fig. 11, are fastened to the door by bolts passing through the holes 13 into the threaded holes; 13 in Figs. 10 and 11 are to be $\frac{1}{16}''$ larger at least, than the threaded holes of the angle irons, to allow for some expansion.

Fig. 10 shows a sheet metal strip with a flange turned down to finish and cover the sharp edge on the top and bottom of the door as mentioned before, and shown in Fig. 1, and in Fig. 14 by 3.

Fig. 11 shows the top and bottom plate with countersunk round holes 13, to correspond with 13 of Fig. 10 and Fig. 9.

I claim,

1. In a door, a sheet of metal bent so as to form parts of the back and front of a door with sufficient partitions for stiffening between, and grooves formed at right angle to these partitions, and slides with shoulders formed on them to fill out the remaining parts of the door.

2. The combination in a door, of sheet metal bent so as to alternately form portions of the front and of the back of the door, with strengthening partitions between, grooves formed therein, and slides to fill out the remaining part of the door, tension members connected by a right and left handed nut, said tension members passing through reinforcing vertical side plates, and through said partitions, said metal sheets being provided with holes and removable covers through which said nuts may be adjusted.

3. The combination in a door, of sheet metal bent so as to alternately form portions of the front and of the back of the door, with strengthening partitions between, and angle irons securing said partitions to the top and bottom rails of the door.

4. A sheet metal door comprising a body formed of a sheet metal strip bent to form corrugations, slides closing the open spaces in said corrugations, said slides being wider than said openings and engaging the corners of the corrugations, and means for binding the edges of said body.

5. A sheet metal door comprising a body formed of a sheet metal strip bent into approximately rectangular corrugations and having pockets formed at the corners of said corrugations, slides having flanges engaging

said pockets, and channel irons binding the edges of said body.

6. A sheet metal door comprising a body formed of a plurality of sheet metal strips connected at their ends and bent into approximately rectangular corrugations having pockets formed at the corners thereof, slides having flanges engaging said pockets, and means for binding the edges of said body.

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