April 13, 1926. 1,581,038

R. A. THOMPSON

FIRE DOOR

Filed July 23, 1925 2 Sheets-Sheet 1

FIG. 1.

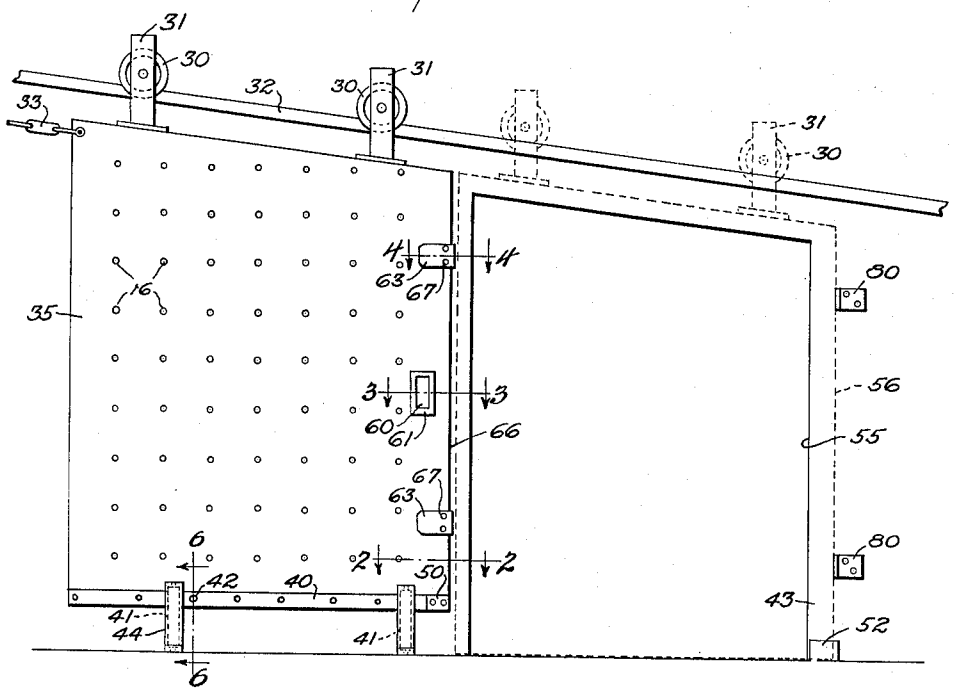


FIG. 2.

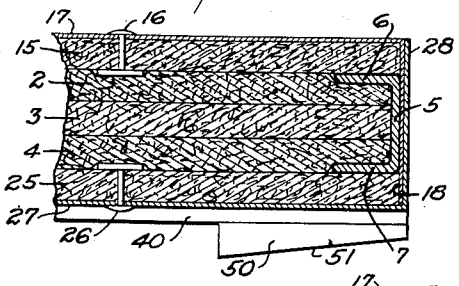


FIG. 3.

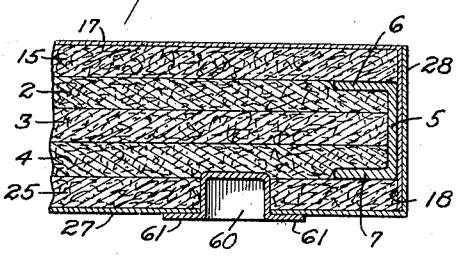
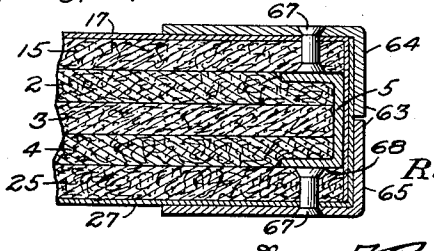


FIG. 4.



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FIG. 5.

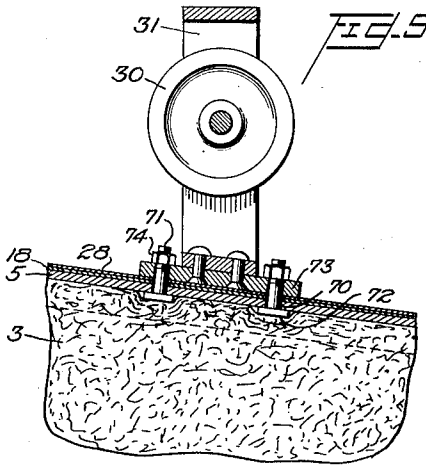


FIG. 6.

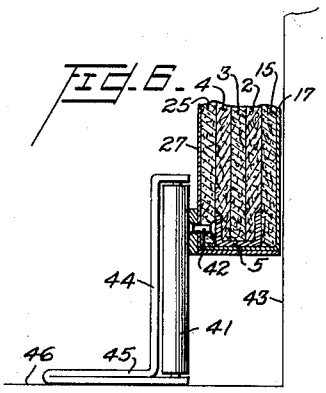


FIG. 7.

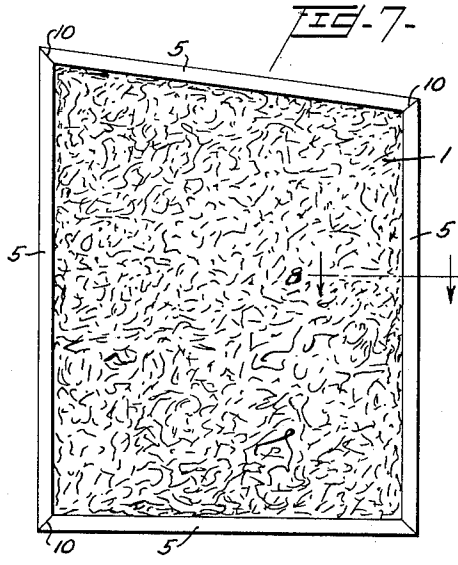
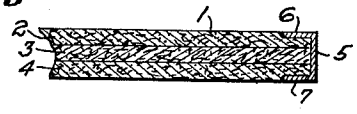


FIG. 8.



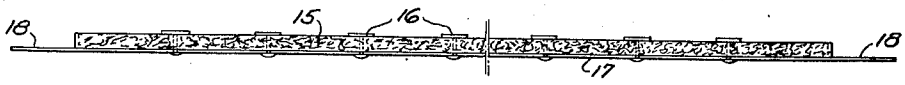


FIG. 9.

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UNITED STATES PATENT OFFICE.

ROBERT ARTHUR THOMPSON, OF NEW ORLEANS, LOUISIANA.

FIRE DOOR.

Application filed July 23, 1925. Serial No. 45,645.

To all whom it may concern:

Be it known that I, ROBERT ARTHUR THOMPSON, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Fire 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.

This invention relates to fire doors, fire shutters, and other analogous constructions adapted to prevent the passages of heat or cold therethrough, and the method of producing the same, and has for its object to provide a construction and a method of production which will be less costly and more efficient than those heretofore proposed.

With these and other objects in view, the invention consists in the novel steps and combinations of steps constituting the method and in the novel details of construction and arrangement of parts constituting the article, all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawings, forming a part of this specification, in which like numerals designate like parts in all the views,

Figure 1 is an elevational view showing a device made in accordance with this invention and used as a fire door;

Figure 2 is a detail sectional view taken on the line 2—2 of Fig. 1, and looking in the direction of the arrows;

Figure 3 is a detail sectional view of the door illustrated in Fig. 1, taken on the line 3—3 of said figure and looking in the direction of the arrows;

Figure 4 is a detail sectional view taken on the line 4—4 of Fig. 1, and looking in the direction of the arrows;

Figure 5 is a vertical sectional view taken in a plane of one of the supporting rollers, and illustrating the bracket support of the door shown in Fig. 1;

Figure 6 is a detail sectional view taken on the line 6—6 of Fig. 1, and looking in the direction of the arrows;

Figure 7 is a side elevational view of the central unit of the door shown in Fig. 1 before the sides are applied thereto.

Figure 8 is a detail sectional view taken on the line 8—8 of Fig. 7, and looking in the direction of the arrows; and

Figure 9 is a top plan view of ane of the side elements making up the door shown in Fig. 1, and before the same has been applied to the central unit shown in Fig. 7.

There have been many constructions of this general character wherein it was desired to obtain a device that could be used as a fire door, as a fire shutter, or other fire barricade, as a cold storage door preventing the passage of heat or cold, as well as a door for sound deadening purposes such as used on engine rooms, linotype rooms, or other places where it was desirous to shut out objectionable noises. It is to a closure of this type that the present invention is directed, and it has been found that a laminated structure such as herein disclosed when made from sheets of fibrous material having interstices, has been quite successful. There is on the market at the present time a sheet material, Celotex, which meets the needs of such a device in that it is material made from bagasse fibers which, however, have not been destroyed in their preparation. That is to say, the original strength and other qualities of these fibers have been retained so that when they are formed into the sheets of Celotex there is provided a strong, durable and compressible material provided with interstices making this material most suitable for the above mentioned purposes. This Celotex is formed in sheets of about one-half inch thickness which can be sawed or otherwise cut like lumber in desirable lengths. This material comes in standard widths, and by the process of lamination, any joints that may be required in building the device in accordance with this invention, may be covered by the next adjacent sheet of this material.

Referring more particularly to Figs. 7 and 8, the central unit of this device generally designated by the numeral 1 is formed by cementing or otherwise securing together three layers of Celotex such as 2, 3 and 4, of

the shape desired to cover the opening to be protected, and applying to the free edges thereof sections of channel iron such as 5. Due to the compressibility of Celotex, these sections of channel iron may be pressed over the edges of the said sheets so that the outer surfaces of the flanges 6 and 7, of the channel 5 will lie substantially in the plane of the outer surface of the outer sheets 2 and 4, all as will be clear from Fig. 8. The ends of each section 5 of channel iron are mitered to form a tight angular joint such as 10, with the end of the adjacent section of channel iron. These joints 10 are then welded in order to form one continuously extending channel bound edge reinforcing the central unit 1, as will be clear from Figs. 7 and 8.

Referring to Fig. 9, another sheet of Celotex material 15 constituting a side unit is riveted or otherwise secured, as at 16, to a sheet 17 of steel or other suitable metal so as to provide portions 18 of the metal extending beyond each edge of the sheet 15. This sheet 15 of Celotex is then secured to the sheet 2 of the central unit 1 in any suitable way as by cementing with silicate of soda or any plastic substance. The extending portions 18 of the metal 17 are then bent around the edges of the laminated structure. In a similar manner, still another sheet of Celotex 25 also constituting a side unit, is secured, as by the rivets 26, to a similar sheet of steel 27, or other suitable metal, just as was the sheet 15 of Celotex secured to its sheet 17 of metal, and said sheet 27 is likewise provided with portions 28 extending beyond the limits of its associated sheet of Celotex 25. This sheet of Celotex 25 is then secured, as by silicate of soda or other suitable plastic cement, to the sheet of Celotex 4 of the central unit 1, and the ends 28 of the sheet of metal 27 are then bent around the edges of the laminated structure and made to overlie the ends 18 of the sheet 17, see Fig. 2. The extending portions 18 and 28 of the sheets 17 and 27 are made of such a width as will cover the edges of all the laminated sheets. In other words, the portions 18 and 28 are so dimensioned that when they are bent around as just described all the edges of the laminated structure will have a double thickness of sheet metal.

The bent-over flaps 18 and 28 are then all welded or otherwise secured together and to the web portion of the channel members 5, as shown in Fig. 2, so as to provide a rigid and substantially hermetically sealed slab of laminated Celotex sheets.

The slab produced as above described is suitable for use in any of the above mentioned applications, but as will be readily understood, the slab may be further provided with necessary devices suitable for handling. In the drawings there has been illustrated a slab adapted to be used as a fire door and provided therefore with the rollers 30 carried by the brackets 31 adapted to travel on the inclined overhead track 32. A suitable fastening such as a fusible link 33, is provided, as illustrated, to hold the slab or fire door generally indicated at 35, in the open position shown.

Figures 2 to 6, inclusive, show details of the devices added to the slab 35 in order to make the same adaptable for use as a sliding fire door, as illustrated in Fig. 1. That is to say, the slab 35 is provided at its bottom edge and on the outer side thereof with a metal guide roller strip 40 rigidly secured to the bottom channel 5, as by the welded rivets 42 and adapted to contact with the guide rollers 41 in order to hold the door 35 close up against the surface of the wall 43. Each roller 41 is vertically disposed, as shown, and suitably mounted in a bracket 44 having a foot portion 45 adapted to be secured to the floor 46. At the lower advancing corner of the door 35 there is secured to the strip 40 a wedge-shaped block 50 whose outer inclined surface 51 is adapted to frictionally contact with the correspondingly inclined inner surface (not shown) of a bracket 52, secured to the wall 43, when the fire door 45 is in closed position, covering the opening 55 in the wall 43, and as indicated by the dotted line position 56, see Fig. 1.

Referring to Fig. 3, it will be observed that one of the outer sheets such as 25 of Celotex is provided with an aperture into which is pressed a means for manually moving the door 35 comprising a metallic flush cup 60 of the usual and well known type for doors of this character. The flanges 61 of this flush cup are spot welded or otherwise secured to the outer metallic covering plate 27 so as to prevent air from entering into the interior of the slab 35.

Referring to Fig. 4, there are disclosed metallic bumpers generally indicated at 63 and which comprise the angle plates 64 and 65 secured to the vertical advancing edge 66 of the fire door. These angles 64 and 65 are likewise welded to the metal covering plates 17 and 27, and are further secured in rigid relation to the slab 35 as by the rivets 67 which are in turn spot welded as at 68 to the flanges of the channel sections 5 of the central unit, thus making a very strong and rigid construction.

In Figure 5 is illustrated the method by which the brackets 31 of the supporting rollers 30 are secured to the fire door 35. Holes 70 are drilled in the web portion of the channel 5 on the upper edge of the door, and bolts 71 passed therethrough. The heads 72 of these bolts are then welded to the inner surface of the channel members 5 before said channel member is pressed on to the laminated central unit composed of

the sheets 2, 3 and 4 of Celotex. These bolts 71 likewise extend through holes in the extensions 18 and 28 of the metallic coverings 17 and 27, and are adapted to pass through suitable openings in the foot plate 73 carried by the bracket 31. Nuts 74 secure bracket 31 in rigid relation to the fire door 35.

Thus it will be seen from the foregoing that a fire door made in accordance with this invention will be released from its open position when the fusible link 33 is melted, and due to the action of gravity the door 34 will move to the right, as seen in Fig. 1, traveling on the overhead track 32. The guide rollers 31 will keep the bottom of the door close to the wall 43, and the bumpers 63 upon contacting with the stops 80 secured to the wall 43 will cause the door 35 to come to rest in such a position as indicated in dotted lines at 56 in Fig. 1. The door 35 is held in this dotted line position by the wedge 50 carried by the door frictionally engaging the bracket 52 coacting therewith and secured to the said wall 43. Thus, the opening 55 is effectively closed and fire prevented from passing therethrough.

Thus it will be apparent that by this invention there is provided a method of producing a building unit or slab consisting of a central unit 1 and a pair of side units 15 and 25, all of said units constituting a cemented, laminated structure of compressible fibrous material providing interstices. Further, the central unit 1 is reinforced by the continuously extending frame of channel sections 5 having the corners or joints thereof welded. Around the entire laminated structure there is provided a sheathing of steel formed by the plates 17 and 27 rigidly secured to the side units, and these said plates are provided with extending portions 18 and 28 adapted to be welded together and to the channels 5 thus constituting a means of securing said side units to said central unit. The entire device is adapted to be so secured together as by welding that a substantially hermetically sealed slab is produced. In other words, a slab made in accordance with this invention provides a means for preventing heat, cold or sound from passing therethrough. Fire will be prevented from passing through such a structure because there is no substantial metal path leading directly through the slab. Further, the intertices of the material Celotex will form dead air cells by being unable to communicate with the atmosphere and hence no combustion will be supported within the structure due to the lack of oxygen. The same air cells will likewise prevent cold and sound from passing through this structure.

It is obvious that those skilled in the art may vary the details of construction as well as the arrangement of parts without departing from the spirit of the invention, and therefore it is not desired to be limited to the foregoing disclosure except as may be required by the claims.

What is claimed is:

1. The herein described heat resisting slab comprising a plurality of layers of compressible fibrous bagasse material constituting a central unit; continuous means to reinforce said central unit; a pair of side units each including a layer of compressible fibrous bagasse material; and a metallic covering rigidly secured to said side units and to said reinforcing means and surrounding all of said layers.

2. In a device of the character described, the combination of a central unit of fibrous bagasse material; continuous means to reinforce said central unit; a pair of side units of fibrous bagasse material; a metallic sheet rigidly secured to each side unit; and means to secure said side units to said central unit.

3. In a device of the character described, the combination of a central unit of laminated compressible vegetable fibrous material; continuous means to reinforce said central unit; a pair of side units of compressible fibrous vegetable material; a metallic sheet rigidly secured to each side unit; and means to secure said side units to said central unit.

4. In a device of the character described, the combination of a central unit of fibrous material; continuous means to reinforce said central unit; a pair of side units of fibrous material; a metallic sheet rigidly secured to each side unit; and means associated with said reinforcing means to secure said side units to said central unit.

5. In a device of the character described, the combination of a central unit of fibrous material; means to reinforce said central unit; a pair of side units of fibrous material; a metallic sheet rigidly secured to one side of each side unit and extending beyond the edges thereof; and means to secure said side units to said central unit.

In testimony whereof I affix my signature.

ROBERT ARTHUR THOMPSON.