Oct. 29, 1935. B. F. FITCH 2,018,663

DOOR

Filed Dec. 28, 1932 2 Sheets-Sheet 1

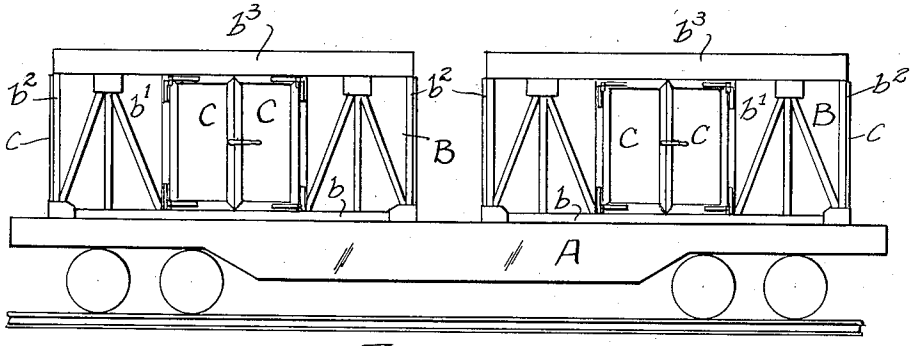

FIG. 1

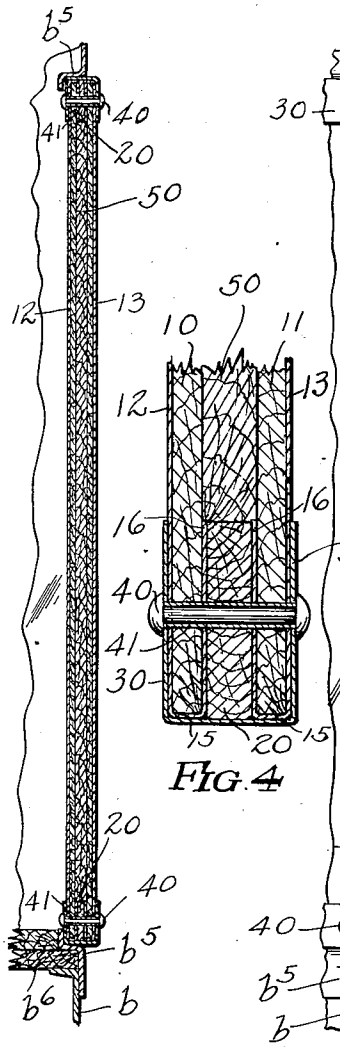

FIG. 4

FIG. 3

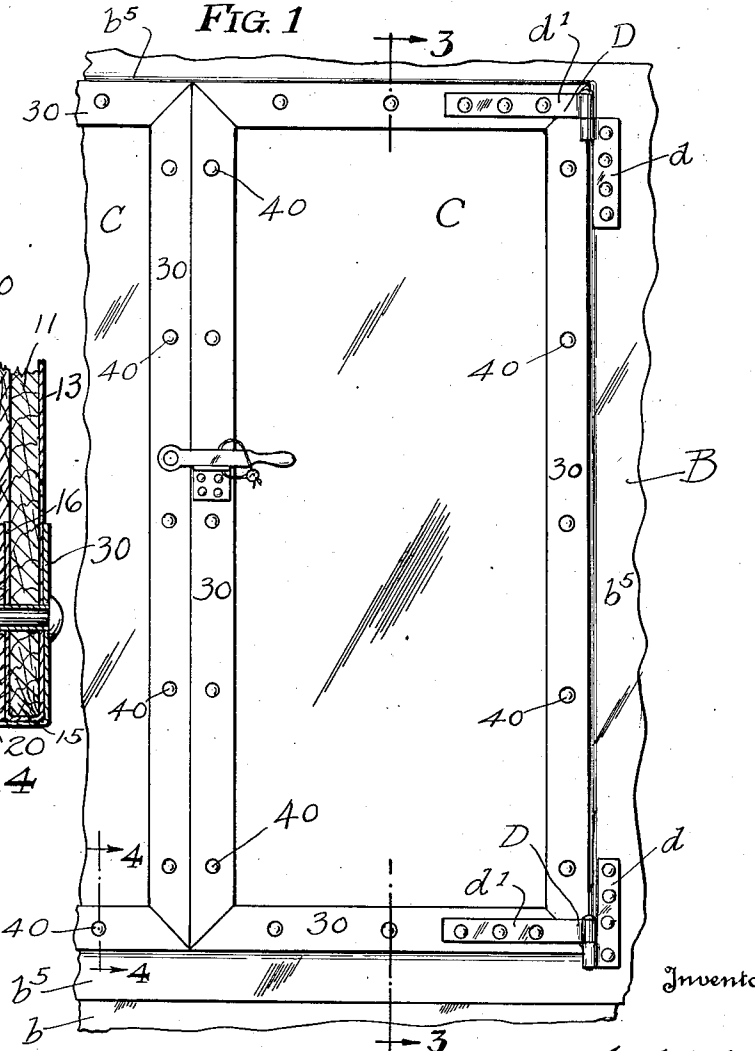

FIG. 2

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Oct. 29, 1935. B. F. FITCH 2,018,663

DOOR

Filed Dec. 28, 1932 2 Sheets-Sheet 2

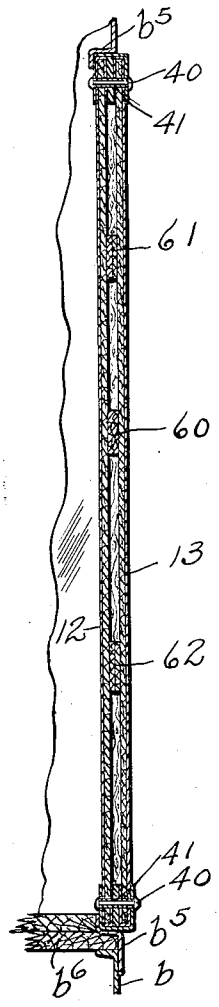

FIG. 6

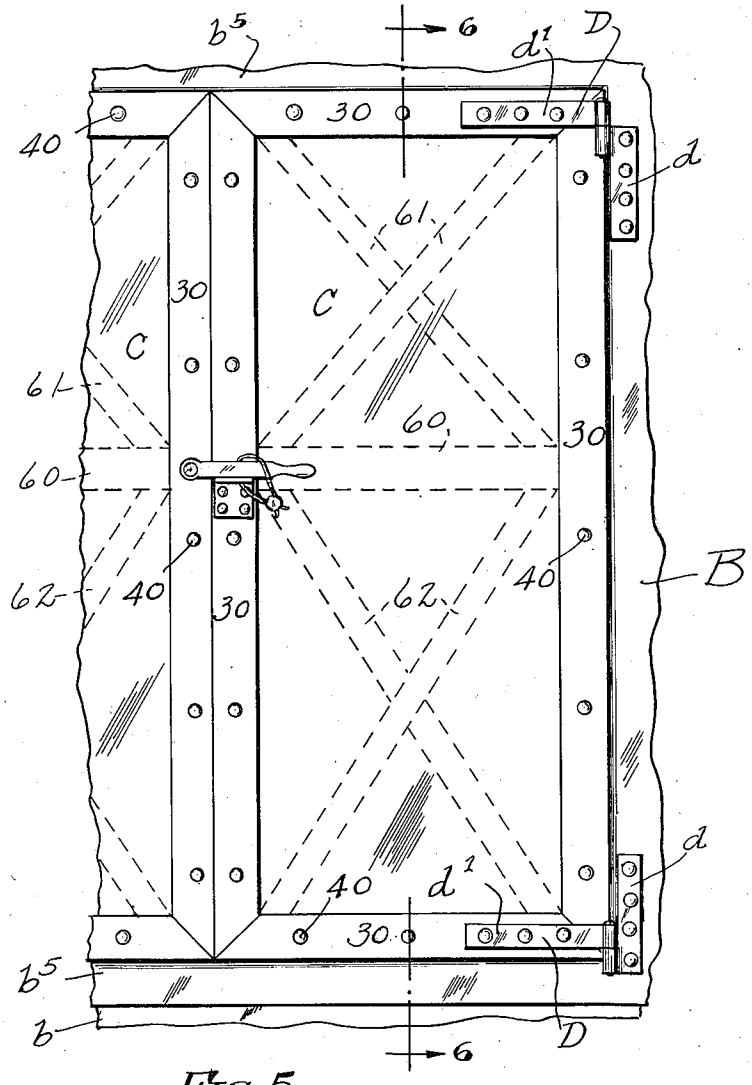

FIG. 5

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Patented Oct. 29, 1935

2,018,663

UNITED STATES PATENT OFFICE

2,018,663

DOOR

Benjamin F. Fitch, Greenwich, Conn., assignor to Motor Terminals Company, Wilmington, Del., a corporation of Delaware

Application December 28, 1932, Serial No. 649,193

4 Claims. (Cl. 20—35)

This invention relates to a door suitable for a container for package freight and particularly for a demountable automobile body adapted to contain such freight and be transferred with its load between a truck and a railway flat car. Such doors are conveniently hinged to the side or end walls of the body by lift-off hinges, and the door should be light enough so that it may be readily lifted off manually when desired, and at the same time should be strong enough to resist any impact from the contained freight, and should be of such construction as not to be liable to distortion during the handling of the body or to warping from the weather, as it is necessary for it to make a tight connection with the door frame.

The object of my invention is to provide a door having the characteristics mentioned, which shall be cheap in manufacture and efficient and durable in service.

To the above end, I form my door of an inner and an outer layer of very light material surfaced on the exterior by sheet metal and I provide sheet metal across the edges of the door to protect the interior layers. I bend the metal of one or both outer sheets at right angles and then backwardly parallel with the outer sheet so as to embrace the edge portion of the interior. To give the desired thickness to the door and stiffen it, the two metal-surfaced layers are preferably spaced apart by filling pieces between them at least at the margins where all of the layers are effectively bound together.

The package freight within the container may impact against the inner face of the door during transit, and to prevent any distortion from this or any other cause, I prefer to provide suitable fillers in the intermediate region between the two layers, which effectively brace them throughout their area.

The above-mentioned features are hereinafter more fully described in connection with the illustrations in the drawings.

In the drawings, Fig. 1 is a side elevation of a railway flat car on which are mounted two demountable automobile bodies, each having my doors; Fig. 2 is a side elevation of one of the doors in place, showing parts of an adjacent door and the door frame; Fig. 3 is a vertical section on the line 3—3 of Fig. 2; Fig. 4 is a cross-section on a larger scale through the door adjacent one edge, as, for instance, in the plane indicated by the line 4—4 in Fig. 3; Fig. 5 is a side elevation similar to Fig. 2 but indicating a modified form of door; Fig. 6 is a vertical section on the line 6—6 on Fig. 5.

In Fig. 1, "A" indicates a railway flat car, and "B" two demountable bodies mounted thereon. Each body has a floor frame "*b*", side and end walls "*b'*", "*b*²", and a roof "*b*³". Formed in one or both side walls and in one or both end walls, if desired, are door frames which, in cross section, may be in the form of Z-bars, as indicated at "*b*⁵", in Figs. 3 and 6. The lower Z-bars *b*⁵ may protect the floor *b*⁶ of the demountable body, if desired.

My doors, which are indicated in pairs "C" in Figs. 1, 2, and 5, are hinged to the door frame by lift-off hinges, indicated at D. These hinges comprise brackets "*d*" secured to the door frame and having upstanding pins, and straps *d'* secured to the door and having eyes embracing the pins. Such lift-off hinges enable the doors to be entirely removed from the body by the manual act of lifting them when they are turned out operably free from the door jamb.

I will now describe the construction of the door itself, as illustrated in Figs. 2, 3, and 4. This door has two opposed panels, each made up of two layers 10 and 11 of wood, or of laminated wooden or fibrous sheets, or of pressed fibrous material having on the outer side metal sheets 12 and 13 adhering to the wooden or fibrous sheets. Such material is on the market under various names, as for instance, "Plymetl".

In making up my door, in its preferred form, from such material, the wooden or fibrous portions are omitted or removed around the margins of the metal sheets. Such sheets are then cut out at the corners and the four projecting regions are then bent across the edges of the fibrous layer, as shown at 15 in Fig. 4, and then bent up onto the inside of such fibrous layer, as appears at 16 in that figure. Such operation produces the two panels, where the entire edge of the layer 10 or 11 is protected.

At the margin of the door, I place, between the inturned metal surfaces, suitable filler strips 20, which are preferably of hard wood and lie adjacent the edge portions of the composite layers, and are flush with the edges. The top and bottom filler strips may be mitered with the vertical strips, if desired, or may abut them, or may be cut half and half to overlap in the form of a half mortise joint.

About the edges of the door are metal reinforcing trough-shaped members 30, which extend across the edges of the two composite members and the filler strip and snugly engage the two

metal facing sheets 12 and 13. These trough members 30 are preferably mitered to make a snug connection between their vertical and horizontal regions on the door face, as shown in Fig. 2. The whole construction is then secured together by rivets 40, passing through the two sides of the binding trough member and through the various intermediate parts.

To prevent hot rivets burning the fibrous or wooden interior, as well as to prevent the shanks of such long rivets from bending when the heads are upset, I prefer to provide within the members 10, 11 and the filler strip 30, bushings 41, which surround the rivet shanks. These bushings might have their outer ends abutting the inner faces of the sheets 12 and 13, but it is simpler to make holes of the external diameter of the bushing through all of the assembled layers and drive the bushings into place from the outside. The structure is then ready to receive the rivets, whose heads are upset in the usual manner.

It will be seen that such a door as described may be very light for the area covered and that the entire exterior is of sheet metal with all of the edges amply protected, first, by the inturned portion of the sheet metal face 12 and 13, and then by the reinforcing binding member 30. These binding members are effectively riveted in place, and by making a close miter joint at the corners of the door, give the structure rigidity against sagging or distortion in its own plane.

To prevent any distortion of the panels of the door in an intermediate region due to the impact of freight within the container, as well as to prevent warping, which might interfere with a tight seating of the door, I provide suitable bracing means within the door between the layers 10 and 11. This bracing means may comprise a sheet of balsa wood 50 (Figs. 3 and 4) which fills the entire space and at its edges engages the inner edges of the filler strips 20. This sheet of balsa wood, while very light, has considerable resistance to compression and thus prevents damage to the door from the impact of freight pressing against it on the inside.

In place of the balsa wood filler 50, I may employ the construction of Figs. 5 and 6, where I have placed within the door, near the center, a cross-strip 60 of hard wood and above and below this diagonal strips 61 and 62, each of these diagonal strips being cut half way through where it crosses the other strip to make a half mortise joint. This construction reduces the unbraced area of the door panel to such a small area that there is little danger of distortion from internal impact.

It will be seen that whichever form of internal bracing is employed, I have produced a door with a complete metal facing but with the interior of light material, which is arranged to effectively hold the sheet metal facing in its planular position. The doors may be cheaply constructed; they are sufficiently light so that they may be readily lifted off the hinges if desired, even though they are of considerable size, and they effectively retain their shape, so that they may maintain a snug seating within the door jambs.

I claim:

1. A door comprising two composite panels spaced apart, fibrous material completely filling the space between said panels, each panel having an inner fibrous layer and an outer layer of metal, the metal layer extending at the margins beyond the fibrous layer and being bent across the edges of the fibrous layer and then inwardly along the inner sides thereof, marginal filler strips between the two inturned metal layers, and rivets passing through the panels and the inturned metal layers thereof and through the intermediate filler strips.

2. In a door, the combination of two composite panels spaced apart, diagonal bracing members between said panels, each panel comprising an inner fibrous layer and an outer metal layer, the metal layer extending at the margins beyond the fibrous layer and being bent across the edges of the fibrous layer and then inwardly along the inner sides thereof, a marginal filler between the two panels lying between the two inturned portions of the two metal layers, and a trough-shaped binding member extending across the edges of the two panels and such filler and overlapping the outer sides of the two metal layers.

3. A door comprising two composite panels spaced apart, each consisting of an inner fibrous layer of substantially the area of the door and a larger outer metal layer bent at all of the margins across the edges of the fibrous layers and along the inner side of such layers, filler strips at the margin between the two inturned portions of the metal layers, a metal boundary member protecting the edge face of the filler strips, and means for securing the two panels and the filler strips and the boundary member together.

4. A door comprising two composite panels spaced apart, each panel having an inner fibrous layer and an outer metal layer, the outer metal layer extending beyond the edge of the fibrous layer and being bent across such edge and then inwardly on the inner side of the fibrous layer, marginal filler strips between such inwardly bent portions of the metal layers, a trough-shaped metal binding embracing the edge of the door, rivets each passing through the two binding flanges, the two panels and the filler strips, and bushings within the interior of the door surrounding the shank of the rivets.

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