F. L. LANE.

FREIGHT CAR DOOR.

APPLICATION FILED AUG. 9, 1907.

970,837. Patented Sept. 20, 1910.

Fig. 1.

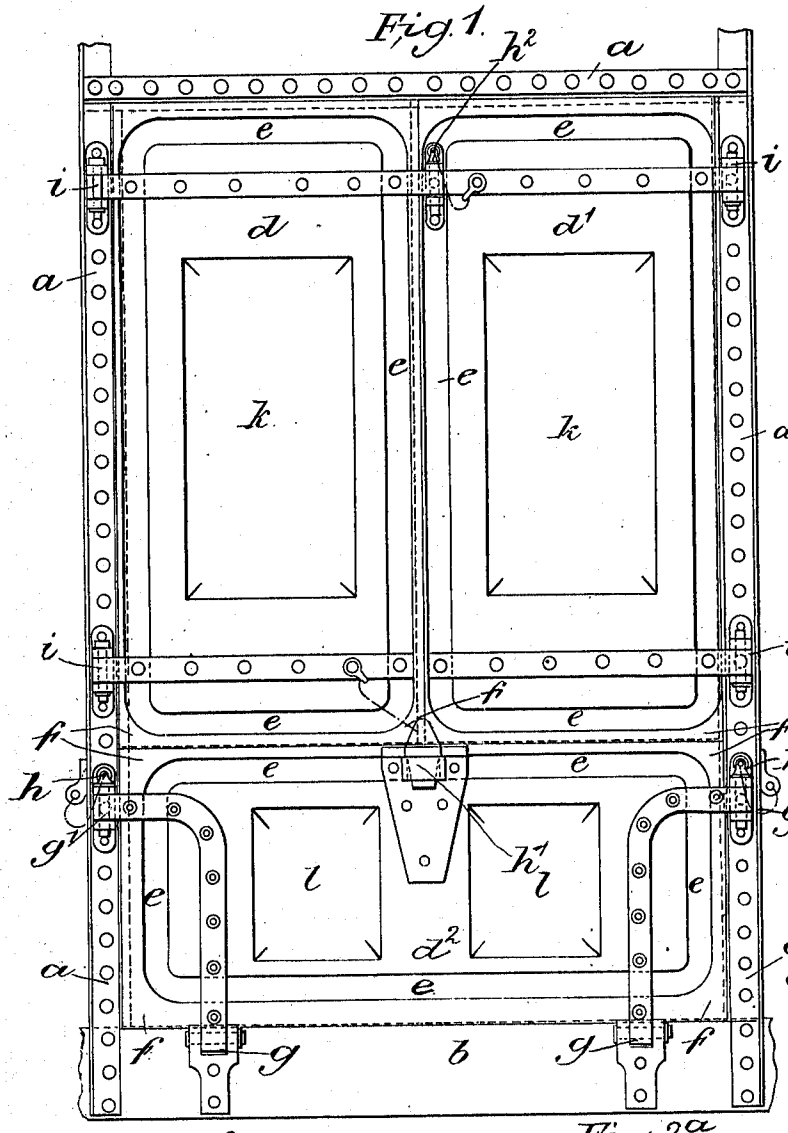


Fig. 3.

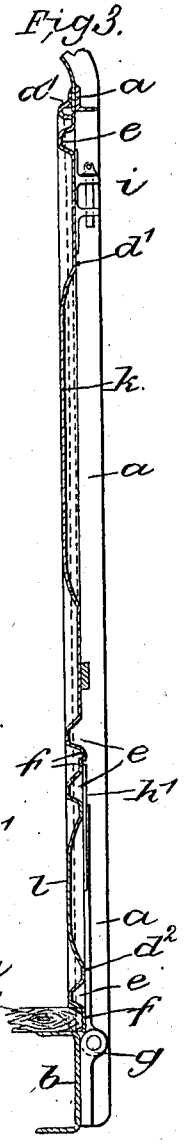


Fig. 2.

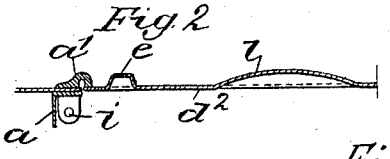


Fig. 2a.

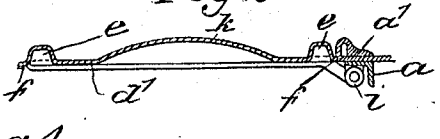
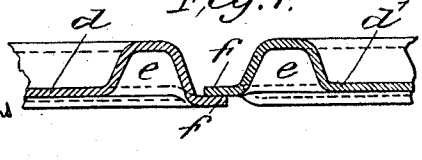


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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FREIGHT-CAR DOOR.

970,837. Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed August 9, 1907. Serial No. 387,913.

To all whom it may concern:

Be it known that I, FRANCIS LAWRENCE LANE, a subject of the King of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented Improvements in Freight-Car Doors, of which the following is a specification.

Wagon doors have been made having a panel with strengthening corrugations, ridges and furrows or embossments and a surrounding or marginal flange, the whole formed out of a single plate of mild steel by cutting to shape, heating and pressing between suitable dies. Sometimes in lieu of the marginal flange there has been riveted to the door a separate frame made by welding flat bars together.

Now the object of the present invention is to economically produce a door which shall be very rigid; which shall be free from objectionable sharp outstanding edges such as obtain in cases where there is a surrounding pressed steel flange, which shall obviate the great expense of the alternative plan of welding up a frame and drilling and riveting it to the door; and which shall at the same time, render it practicable, in cases where one door is required to close against another, to joggle the doors along the edges so that one door shall overlap another, thus making them rain-tight. For this purpose a door according to this invention is made with a continuous strengthening corrugation or hollow ridge surrounded by a plain marginal portion as hereinafter more particularly described. Such doors may have their panels formed with buckles or corruguations if desired to give stiffness and to facilitate manufacture.

Referring to the accompanying illustrative drawings, Figure 1 shows in elevation so much of the side of a wagon as is necessary to illustrate the construction and relative arrangement of a set of three doors according to this invention. Figs. 2 and 2^a are horizontal sections through the lower door and the right hand upper door respectively. Fig. 3 is a vertical section through the right hand upper door and the lower door, and Fig. 4 is a detailed view to a larger scale illustrating the marginal construction and overlapping of the two upper doors.

a is the door-way frame, b the sole bar, c a portion of the wagon floor, d d^1 are the upper doors; d^2 is the lower door.

Each door is pressed from a single plate of mild steel with a continuous corrugation or hollow ridge e at a short distance from the edges of the door so as to leave a surrounding plain marginal portion f such as will close against and overlap an appropriate part of the door-way frame as at a^1 or the marginal portion of a juxtaposed door, as represented in the drawings, where it will be seen the doors d d^1 are joggled and the door d overlaps the door d^1 and that both these doors at their lower parts overlap the upper part of the lower door d^2, which is hinged at g; the hinge plates, riveted to the door itself, being extended laterally and formed with eyes at g^1 for the fastening cotters h.

h^1 is a cotter carried by the lower door for securing the upper doors, which are hinged at i and fastened near their upper parts by a cotter h^2.

In the example the panels of the upper doors are pressed with embossments k and the lower door with embossments l.

Pressed sheet metal panels for ceilings or door panels or the like have heretofore been proposed with a continuous corrugation near the edges of the panel and the corners of which are curved, the portion of the door inclosed by the corrugation being in some cases formed with dished or embossed parts of rectangular form, an intermediate flat portion being left between the dished or embossed parts and the corrugation, but as will be understood such a panel is not suitable for use as a wagon door which according to this invention and as hereinbefore described is formed complete in itself from a single pressed steel plate.

It will be observed that this door is complete in itself in that it is self-sustaining, the character of the metal and the location of the continuous stiffening groove being such that the door requires no stiffening or bracing reinforcing plates or bars and no additional marginal plates to form the top and bottom rails or the stiles of the door.

It will be observed that the dishing of the door plate is within the marginal hollow ridge, this dishing of the metal being formed by pressing it bodily in the same direction the metal is pressed to form said

hollow ridge. In this way the comparatively large area within the marginal ridge is bridged by an arch-like panel, whereby buckling under either transverse or longitudinal strains is provided against and the maximum stiffness with a given thickness of sheet is obtained. This rigidity is increased by having the flat portions within and outside the marginal rib in the same plane, and it is further increased by having the edges of the dished panel parallel with the adjacent portions of the marginal ridge, as is obvious.

What I claim is:—

A freight car door consisting of a rectangular sheet of steel having extending around it at a distance from its edges a continuous hollow ridge, said ridge being rounded at its corners and being formed by pressing the metal of the sheet bodily inwardly, the margin of the sheet outside this ridge being flat, said sheet having within said continuous ridge a dished or arched panel formed by bodily pressing inwardly the metal of the sheet, the sheet between this dished portion and the ridge being flat and in the same plane with the flat marginal portion, said dished or arched panel being rectangular and having its edges lie parallel, with the vertical and horizontal portions of the said ridge, for the purpose set forth.

Signed at Leeds Forge, Leeds, in the county of York, England, this thirtieth day of July 1907.

FRANCIS LAWRENCE LANE.

Witnesses:

B. CROWTHER,

THOS. R. WHITE.