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GRAIN DOOR

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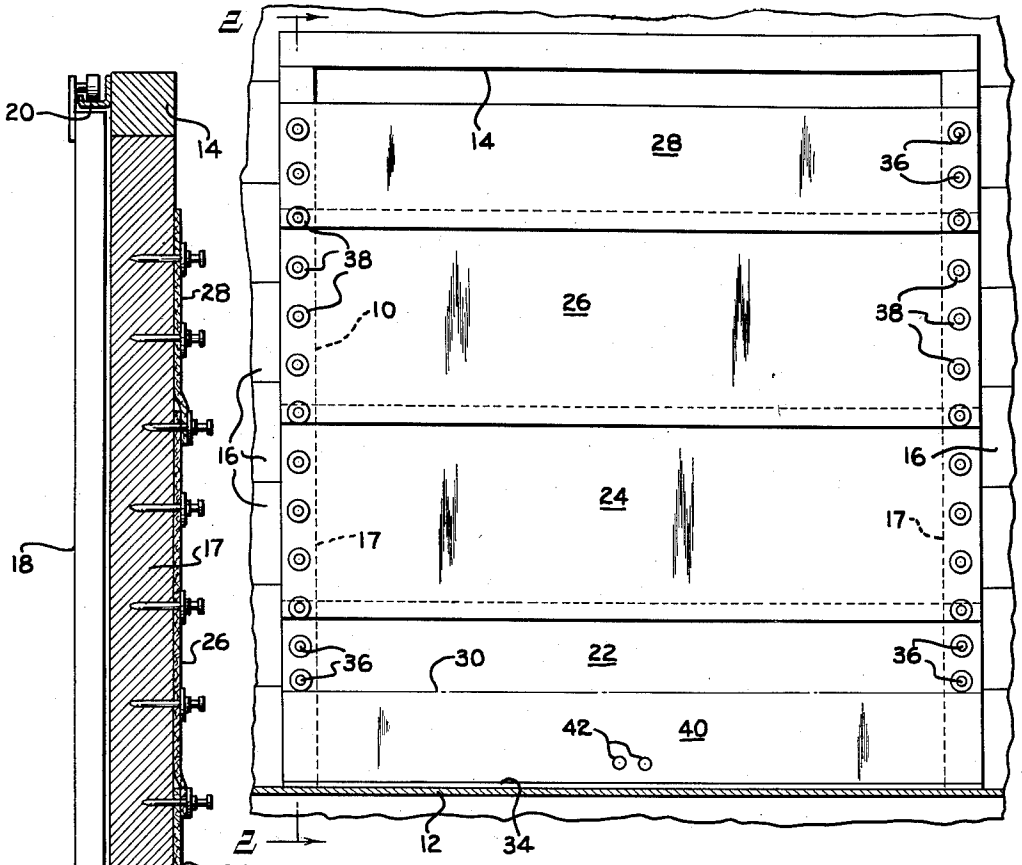


Fig. 1

Fig. 2

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GRAIN DOOR

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The present invention relates to railway car doors and especially to such doors having particular utility in handling loads having low bulk densities such as corncobs and the like.

In the past in connection with the transportation of grain in railway cars it has been proposed to install a temporary door of cardboard or the like to provide a grain-tight seal at the car door opening. The grain car door shown, for example, in Patent No. 2,599,443 is typical of the best of such prior developments. This grain door comprises a number of cardboard sections each reinforced by steel straps which are secured to the vertical side edges of the car door opening. The cardboard sections are not themselves secured to the car door opening but are secured thereto through the agency of the steel straps which support the major portion of the load imposed by the grain within the railway car. It is inherent in the nature of these doors that their removal necessitates their partial or complete destruction. Accordingly it is essential that the expense of the temporary doors be held to a minimum.

While it has been found that doors constructed in accordance with the aforesaid patent are suitable where loads of high density such as wheat, rye and other loose grains are carried within the car they are not wholly satisfactory for use with loads of low bulk density such as corncobs.

For example, despite the simplicity of the doors they nevertheless necessitate the use of steel reinforcing straps, which, in view of the temporary nature of the doors, are relatively expensive. Also because of the employment of steel straps the doors are in many cases relatively difficult to remove. Further, since the doors must be installed from the interior of the car and are securely fastened thereto from top to bottom it is difficult for the workmen to leave the car after completing the installation of the doors unless a substantial opening is left at the top of the door which significantly decreases the load carrying capacity of the car.

In recognition of these disadvantages of the prior constructions it is the primary purpose and object of the present invention to provide improved temporary railway car grain doors of simplified construction and correspondingly reduced cost which may easily be installed and removed from a railway car door opening.

It is also an object of the present invention to provide novel grain car doors which permit maximum utilization of the load carrying space in the railway car.

It is a more specific object of the present invention to provide novel grain car doors which incorporate means permitting egress of the worker after installation of the door without interfering with the sealing effectiveness of the door and without decreasing its effective height.

Further objects and advantages will become apparent as the description proceeds in connection with the accompanying drawings in which:

Figure 1 is a front elevation of a door constructed in

accordance with the present invention installed in a railway car door opening; and

Figure 2 is a vertical section taken along line 2—2 of Figure 1 illustrating the means by which the door is secured to the car door opening.

Referring now more particularly to the drawings, 10 indicates a grain car door opening bounded at its lower edge by the car floor 12, at its upper edge by a header board 14 and along its vertical side edges by the edges of the wooden planks 16 which ordinarily line the interior of a grain car or by a vertically extending nailing post 17 disposed vertically along the edges of the planks 16. The usual permanent car door 18 is suspended on tracks 20 outwardly of the opening 10 in accordance with conventional practice.

The temporary grain sealing door which forms the subject of the present invention, comprises a number of elongated sheets preferably of water-proof corrugated fiber board which is relatively inexpensive and which possesses considerable rigidity and resistance to tearing. The door comprises a number of sections rather than a single sheet to facilitate shipment of the knocked-down door in minimum space. The number of sections employed will depend on the height of the door and the degree of closure desired. For purposes of illustration, four such sections 22, 24, 26, and 28 are shown.

The lowermost closure section 22 is provided with upper and lower score lines 30 and 32, respectively, which are parallel to each other and to the lateral edges of the section 22 and extend the full length thereof. The portion 34, extending downwardly from the score line 32, is bent at right angles to the portion of the section above the score line to form a floor engaging bottom sealing flap which, in the installed position of the section 22, is disposed in full surface contact with the floor 12 of the grain car. With the section 34 so disposed the lower closure section 22 is anchored to the vertical edges of the car door opening by double headed nails 36 which extend successively through two inch tin washers 38, the end edges of the section 22, and into the planks 16 or the nailing post 17 if one is provided. The double heads on the nails facilitate removal of the nails and the washers 38 provide an adequate bearing surface so that the heads of the nails do not puncture or extend through the end edges of the section 22. It is to be particularly noted that the fastening nails 36 are disposed entirely above the score line 30 so that the portion of the closure section 22 lying below the score line 30 may be freely swung away from the car door for a purpose more fully explained below.

After the lower closure section 22 is installed in the position shown in Figures 1 and 2, the upper closure sections 24, 26 and 28 are successively installed, each overlapping the section immediately below as illustrated. An overlap of six inches has been found adequate to provide the necessary seal. Each of the upper closure sections 24, 26 and 28 is anchored to the vertical edges of the car door opening 10 by additional nails 36 and washers 38 in the same manner as the lower closure section 22.

As stated above, it is essential, when transporting low bulk density loads, such as corn cobs, that the load carrying capacity of the cars be fully utilized since the size of the load which can be transported is limited by space factors rather than by weight as in other types of loads. It will noted that in the present construction the top of the uppermost closure section 28 is almost at the level of the top edge of the opening 10, the opening between the upper edge of the section 28 and the upper edge of the car door being sufficient merely to permit loading of the car after installation of the door. In cases where arrangement is made for roof loading of the car the edge of the upper section may be attached to the upper hori-

zontal edge of the car door opening **10** to provide a fully closed door which permits full utilization of the load carrying space within the car. In prior constructions this complete utilization of the load carrying space within the car has been impossible since in all cases it has been necessary to leave sufficient space at the top of the temporary door to permit the egress of the workman.

It is an important feature of the present invention to provide for the first time an effective solution to this long standing problem in the field. To this end the present invention contemplates the provision in the lower closure section **22** of means permitting egress of the workman after installation of the doors which either fully close the car door opening or close the opening as far as the means of loading will allow. This means comprises the portion **40** of the lower closure section **22** below the score line **30**, which, as stated above, is not fastened to the edges of the car dor opening and may accordingly be freely swung away from the car door to the position shown in phantom lines in Figure 2 to provide an opening through which the worker may leave the car. The size of the opening afforded by door **40** may vary but will usually be about 20 inches in a typical installation. To facilitate this movement of the door portion **40** of the lower closure section **22** two finger grip holes **42** are provided which permit the workman to pull the section inwardly despite substantial frictional resistance between the floor engaging section **34** and the floor of the car. The gripping means also enable the workman to pull the door to its fully closed position to establish a tight seal.

It has been found by actual test that an effective seal may be maintained at the lower portion of the door despite the fact that no fastening means are provided below the score line **30**. It has further been demonstrated by actual test that the corrugated water-proof fiber board closures sections **22—23** furnish adequate support of low bulk density loads such as corncobs without the expensive steel reinforcing straps employed in prior constructions.

Thus it will be seen that the present invention has attained the above stated objects by the provision of novel temporary grain car doors which may be utilized at low expense both because of their low initial cost and because of the low cost of installing and removing the doors and which permit greater utilization of the load carrying spaces of the grain car than heretofore possible while providing a door of sufficient strength to afford more than adequate support for loads of low bulk density.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. In a temporary door for a railway car adapted to contain a bulk load, said car having a floor and a door opening having vertical side edges, said door including a closure section comprising an elongated sheet of water proof fiber board the opposite ends of which are adapted to extend over the side edges of said door opening, a first score line formed across the length of the sheet parallel to the lateral edges thereof, a floor engaging section extending downwardly from said first score line, said board being foldable along said first score line so that it will form a floor engaging section adapted to lie in full surface contact with the floor of said car in the installed position of the door, a second score line above and parallel to said first score line, means securing the end edges of said sheet to the vertical side edges of said door opening only above said second score line whereby the portion of said closure section extending below said second score line may be freely moved away from said door opening to permit egress of a workman after installation of the door and is adapted to be held in substantial sealing relationship with said car door opening after egress by the load in the car.

2. The door according to claim 1 together with means in the portion of said closure section below said second score line for affording a grip for the use of the workman to facilitate movement of said portion away from said car door opening.

3. The door of claim 1 wherein the means for attaching the end edges of the closure section to the edges of the car door opening comprise washers on the inner side of said section and nails extending successively through said washers, said sheet and into the side edges of said door opening.

4. A door according to claim 1 together with a plurality of additional closure sections secured to the edges of said car door above said first closure section, the bottom edge of each of said additional sections overlying the upper edge of the sheet immediately below and the upper edge of the topmost sheet being disposed closely adjacent the upper edge of said car door opening.

5. In a temporary door for a railway car adapted to contain a bulk load, said car having a floor and a door opening having vertical side edges, a closure section comprising an elongated sheet of water proof fiber board the opposite ends of which are adapted to extend over the side edges of said door opening, a floor engaging section extending downwardly from a first score line formed along the length of said sheet parallel to the lateral edges thereof, said board being foldable along said first score line to form a floor engaging apron adapted to lie in full surface contact with the floor of said car in the installed position of the door, a second score line above and parallel to said first score line, means securing the end edges of said sheets to the vertical side edges of said door openings only above said second score line whereby the portion of said closure section extending below said score line may be freely moved away from said door opening to permit egress of the workman after installation of the door and said closure portion is adapted to be held in substantial sealing relationship with said car door opening after egress of the workman due to the weight of the bulk load in the car, a plurality of additional closure sections secured to the edges of said car door above said first closure section, the bottom edge of said additional sections overlying the top edge of the section immediately below and the upper edge of the top-most section being disposed closely adjacent to the upper edge of said car door opening, and means in the portion of said closure sections below said second score line for affording a grip for use of the workman to facilitate movement of said portion away from the car door opening to permit egress.

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