Nov. 9, 1965 M. J. FORD 3,216,483

TEMPORARY DOOR

Filed March 19, 1962

FIG. 1

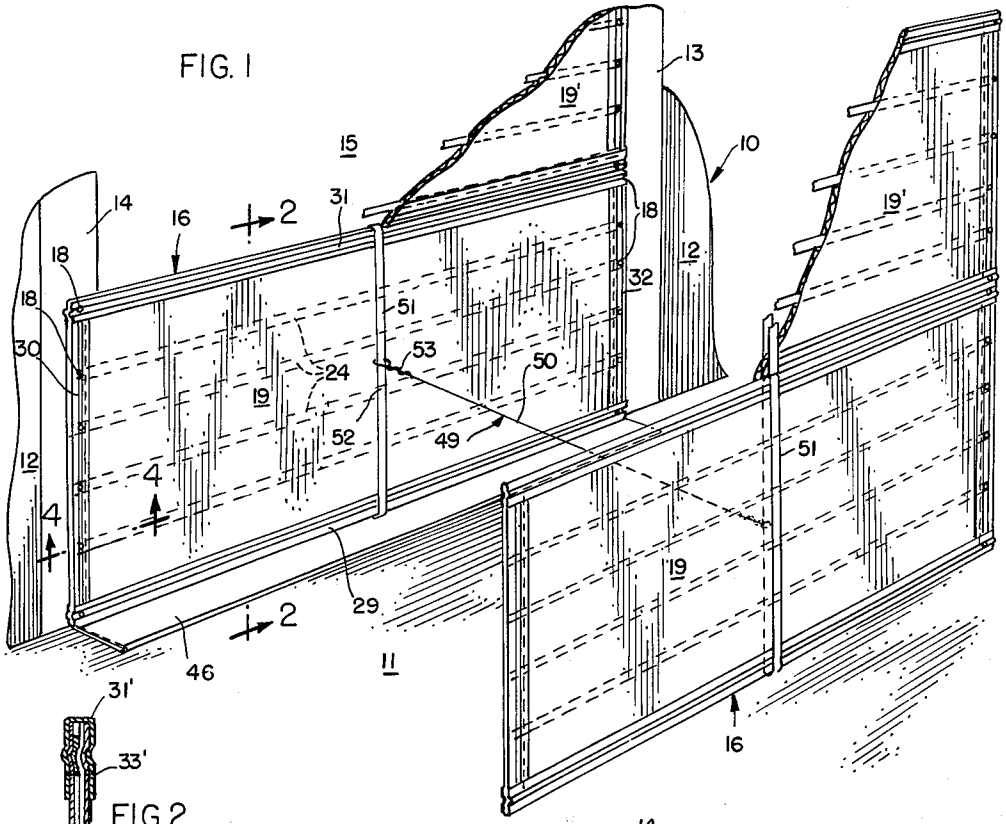


FIG. 2

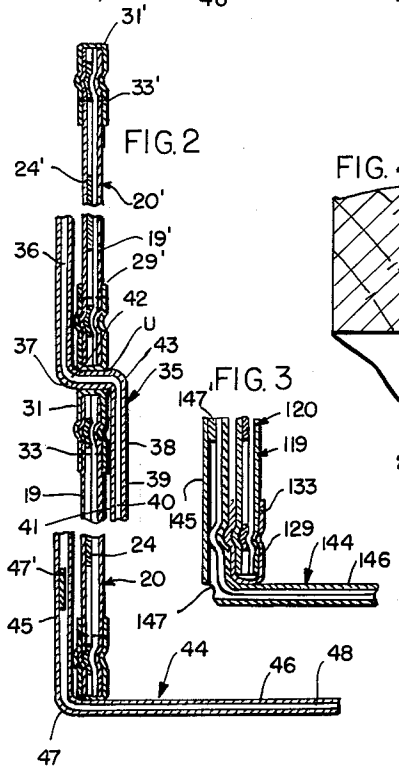


FIG. 3

FIG. 4

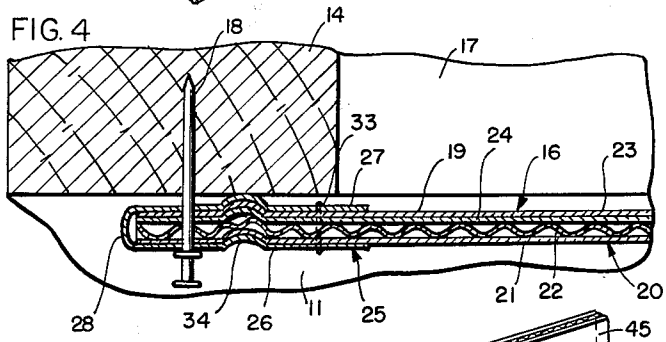
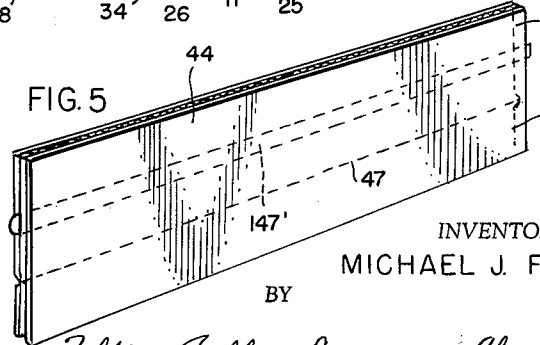


FIG. 5



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United States Patent Office

3,216,483
Patented Nov. 9, 1965

3,216,483

TEMPORARY DOOR

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Filed Mar. 19, 1962, Ser. No. 180,893
6 Claims. (Cl. 160—368)

This invention relates to a temporary door and, more particularly, to a temporary door for a freight vehicle.

The temporary door with which the instant invention is concerned is panel-like in construction and finds advantageous utility in confining granular materials. Heretofore, two basic types of panels or barriers were employed in freight vehicles. The older utilized built-up timbers, for example, to close the doorways of grain-carrying freight cars. During the last twenty years or so, this technique has been superseded by the use of paperboard panels, reinforced by steel strapping. A number of disadvantages attend either expedient. The timber barricades are expensive and ponderous. The use of the lighter weight paperboard barriers usually resulted in splintering of the door posts. This follows from the fact that the securing nails were driven at an angle to properly tension the metal straps reinforcing the otherwise flexible and rupturable paperboard barriers. It would be desirable to provide a panel that combines the advantages of both of the previously-employed barricades without the disadvantages of either, and the achievement of this constitutes a principal objective of this invention.

Another object of the invention is to provide a lightweight, readily stackable panel for use in connection with freight vehicles. The long-used wooden barricades, if they were prefabricated, could be stacked and subjected to weathering. However, their ponderous nature limited this application. On the other hand, the prior-used paperboard doors, although thin to facilitate stacking, were essentially incapable of standing up under adverse weather. Further, the paperboard panels were of considerable extent, which made their handling difficult. The instant invention unites the advantageous lightweight of the previously-employed paperboard doors with the stackability of the wooden doors.

Other objects and advantages of the invention may be seen in the details of construction and operation set down in this specification.

The invention will be described in conjunction with an illustrative embodiment in the accompaning drawing, in which—

FIG. 1 is a fragmentary perspective view of a freight vehicle showing the inventive panel doors installed in place;

FIG. 2 is an enlarged fragmentary cross-sectional view of the installation of FIG. 1 such as would be seen along the sight line 2—2 applied to FIG 1;

FIG. 3 is a view similar to FIG. 2 but in which an alternative form of securement of the dependent flap portion is illustrated;

FIG. 4 is an enlarged horizontal sectional view of a door panel secured to a doorway framing post of the freight vehicle; and

FIG. 5 is a perspective view of the flap portion utilized in connection with the construction seen in FIGS. 1 and 2.

In the illustration given, and with particular reference to FIG. 1, the numeral 10 designates generally a freight vehicle which is seen in fragmentary form, being defined by a floor 11, side walls 12, and vertically-extending, doorway framing posts 13 and 14, the doorway itself being designated by the numeral 15. It will be immediately

appreciated that in a boxcar, two such doorways 15 are provided, and in FIG. 1, it is seen that a pair of opposed closures generally designated 16 are provided.

Reference to FIG. 4 shows the doorway framing posts 14 and the usual sill plate 17, along with the car floor 11. Installed across the doorway 15 and secured to the framing post 14 by means of a nail 18 is the inventive door panel 19.

The panel 19, as best seen in FIG. 4, is constructed of a corrugated paperboard or fibrous body generally designated 20, which includes an inner liner 21, a corrugated core 22, and an outer liner 23. Positioned within the body 20 and between the core 22 and outer liner 23 is a plurality of flat sheet steel straps each designated 24.

As a specific example of the inventive construction, the liner sheets 21 and 23 may be constructed of 42 pounds per ream kraft paper, with the corrugated core 22 being constructed of 33 pounds per ream kraft. The straps 24 are ¾" wide and 0.023" thick. Ordinarily, the panel 19 will be about three feet high, so that two such panels are provided in stacked, edge-to-edge contacting relation to close the doorway 15 to a satisfactory height for the prevention of outflow of granular material.

Each panel 19 is equipped with a perimetric border generally designated 25, which, in the illustration given, is seen to be constructed of sheet steel formed on itself to develop a U shape or channel in cross section. 30 gauge sheet steel may be advantageously employed for the border 25. The border 25 is seen to be made up of generally flat sides 26 and 27, united at the edge of the body 20 by a bight portion 28. Preferably four such borders are provided as at 29, 30, 31 and 32 as applied to FIG. 1. The border 31 is seen to be in overlapping relation with the borders 30 and 32 at the upper corners of the panel 19, while the border 29 overlaps the borders 30 and 32 at the lower corners.

Each border 29–32, as the case may be, is optimally secured to the body 20 by means of stitching 33. The stitching makes use of a heavy metal wire thread and can be essentially a continuous operation along the length of a given border 25. Excellent results are also obtainable when the stitching is interrupted along the length of each border 29–32, as the case may be, being placed, however, in alignment with each of the straps 24, which are generally coextensive with the body 20, as can be appreciated from FIG. 4.

In the illustration given, each border 29–32 is equipped with an outwardly-extending bead or deformed portion 34 (best seen in FIG. 4). The bead or grooving 34 serves to pre-tension the strapping 24 and effectively minimizes bulging of the panels 19, thus achieving an installation analogous to that of the heretofore-employed wooden timbers. It will be appreciated that the wooden barricades were essentially nondeformable, while the paperboard barriers were characterized by considerable bulging, which resulted in abrasion when the usual sliding storm doors were opened and closed, as during a sampling operation.

The provision of the beading 34 is also advantageous in that it facilitates the stacking of the panels in a nested, aligned condition. It will be appreciated that one of the principal areas of grain leakage or seepage is along the vertical joint between the temporary door and the doorway framing posts 13 and 14. In the past, when wooden doors have been utilized, it has been necessary to employ gasketing material, and the like, to insure the absence of gaps or leaks. With the previously-employed paperboard doors, additional side battens, nailing strips, etc., had to be employed. In any event, this required additional nailing, and one of the principal causes of freight car deterioration is the splintering of door posts by virtue of removal of the nails securing the temporary doors in place.

During unloading, the temporary doors are usually removed by means of a ram provided as part of the car tilting mechanism. The ram serves to urge the panels 19 inwardly and out of securement with the door posts 13 and 14. Through the employment of the rigidifying border 25, it is possible to utilize nails 18 driven in essentially straight, as contrasted to the above-referred-to angled nailing so that a clean hole is left when the panels 19 are removed. Also, it will be noted that the nails 18 are preferably installed in alignment with the straps 24. In certain instances, it may be advantageous for a particular usage to perforate the straps 24 to accommodate the passage of the nails 18. Further, in some instances, it may be preferable to construct the panels 25 out of nonmetallic material such as paperboard, plastic, etc., in which instance it is additionally possible to conveniently apply printed dot indicia in alignment with the perforated nail openings or perforations in the straps 24. Also in certain instances it may prove desirable to secure the borders 25 together at the corners by means of rivets rather than the continuation of stitching as indicated above.

A consideration of FIG. 2 reveals the vertically-stacked relation of the panels 19 and 19'. Here, it will be appreciated that the panel 19' is identical with the panel 19 except that the various parts are designated by the same numeral but with the addition of a prime. In certain instances, it has been found advantageous to provide an additional seal for the line of union "U" existing between the upper panel 19' and the lower panel 19. The additional seal is designated generally by the numeral 35, and is seen to include an upstanding portion 36, a horizontal portion 37, and a depending portion 38. As illustrated in FIG. 2, the seal 35 is constructed of corrugated paperboard having an inner liner 39, a corrugated core 40, and an outer liner 41. The transverse portion 37 is developed by scoring and folding the seal 35 along horizontal lines as at 42 and 43. It will be appreciated that the flutes of the corrugated core 40 are vertically disposed in the portions 36 and 38, corresponding to the disposition of the flutes in the corrugated core 22 of the main panel 19.

A similar sealing member generally designated 44 is provided along the lower edge of the lower panel 19, the seal 44 having an upstanding portion 45 and a horizontally-extending portion 46 which also serves as a floor flap. Optimally, the upstanding portion 45 may be equipped with a sheet steel strap 47' similar to the straps 24.

In installation, the seal piece 44, which can be seen in FIG. 5, is folded along the line of weakness 47 and positioned with the portion 46 on the floor immediately inward of the sill plate 17, with the upstanding portion 45 abutting the inside of the doorway framing posts 13 and 14. The upstanding portion 45 may be secured by nails, or the like, to the framing posts 13 and 14. Thereafter, the lower panel 19 is set in place as seen in FIGS. 1 and 2 and secured by means of the nails 18. The next step calls for positioning of the upper seal member 35 in place, as seen in FIGS. 1 and 2, the seal piece 35 previously having been folded, as seen in FIG. 2. The upstanding portion 36 again may be tacked in place by nails, or the like, extending into the door posts 13 and 14. Thereafter, the upper panel 19' is installed in a fashion similar to the lower panel 19.

With the above described installation, it will be seen that the flutes of the corrugated core 40 of the upper seal member 35 and the flutes of the corrugated core 48 of the lower seal member 44 are disposed transverse of the length of the panels 19 and 19', respectively. This permits an advantageous compression to compensate for any lack of precise smoothness or evenness of the bight portions 28 of the longer border members 29, 31 and 29'.

Further, through the stepwise installation procedure outlined above, it is possible to first install only the lower panel 19 and thereafter fill the car by means of a swivel loader. Swivel loaders conventionally employed develop a stream of grain which enters the car about four feet above the floor. The grain stream is directed toward the ends of the car, and thus the car may be loaded with only a partial closure in place. Thereafter, the upper panel 19' and the seal member 35 may be installed.

The installation of the panels 19 and 19' is usually achieved by a cooper or carpenter working from inside the car. Because of the rigidifying effect provided by the border 25, it is possible for one man to cooper the car alone. Also, the reinforced perimeter of the panels, particularly along the horizontal longitudinal sides, in combination with the vertically-extending flutes of the corrugated cores 22 and 22', makes it possible for the composite door to support the weight of the cooper as he climbs over the installed door to leave the car.

Where the widths of the doorways 15 are seven feet or more, it has been found advantageous to provide center bolsters, such as is designated generally by the numeral 49 in FIG. 1. The bolster 49 includes a cross-tie wire 50 which has ends looped around center braces 51 provided on each panel 19. The center braces 51 optimally may be constructed of strapping such as the straps 24 looped around the panels 19 with an overlap as at 52. The cross tie wire 50 extends between the center brace 51 in the area of the overlap 52 and the main body 20 of the panel 19, the cross tie wire 50 being wound on itself as at 53 to provide a secure connection.

In the assembly of the composite door making use of the seal members 35 and 44, it may be advantageous to provide the members pre-connected to the panels 19 or 19', as the case may be. Such is illustrated in FIG. 3, where the lower panel is designated generally by the numeral 119 and the seal member generally by the numeral 144. As before, the upstanding portion 145 of the member 144 is equipped with a steel reinforcing strap as at 147'. The seal member 144 is longitudinally scored as at 147 to develop a lower floor flap portion as at 146. One method of securement of the member 144 to the panel 119 is through stitching as at 133, where the stitching, in addition to securing the border 129 to the body 120, additionally secures the upstanding portion 145 thereto. Here, it will be appreciated that other forms of securement may be advantageously utilized, such as staples, rivets, etc.

In the operation of the invention, the doorway is coopered closed, as indicated above, with the installation of the upper panel 19' depending upon the type of equipment employed for the filling of the car 10. After the car 10 is filled, the usual sliding storm doors are closed and sealed and the car delivered to a grain center such as Chicago, where the grain is sold on the grain exchange. For this purpose, it is necessary for the brokers to have a sample of the grain from within the car, and the seal on the storm doors is broken, permitting the artisan to enter to take a sample from various depths of the grain within the car. In the past, it has been necessary to pry open the doors, since the bulging of the relatively flexible paperboard bodies created a pressure against the sliding storm doors that made them difficult to open. Also, the wear and tear on the various bearings necessitated additional force for opening the doors than could be exerted by a single man standing out in the freight yards. For this purpose, a pointed pry-bar was employed. The sliding storm doors on boxcars can be opened a matter of two or three inches by means of the latch and thereafter the pry-bar is thrust into the car and against a lower abutment heretofore provided that acted as a pry-bar. This function, when needed with the inventive panels 19—as where the door bearings are distored—is provided by the lower border 29 and aided by the upstanding portion 45 or 145, as the case may be. The seal 144 aids in providing an anchor for the pointed tip of the pry-bar, while the reinforced border 129 prevents the pointed end of the pry-bar from penetrating through the panel 19. After the sample

has been taken, the boxcar is again closed and sealed, and thereafter removed to its ultimate destination. Hence, it is important that the integrity of the temporary barrier be maintained until final delivery of the grain-carrying car. This is advantageously achieved through the provision of the border **25**, since the additional thickness provided at the area of possible penetration resists complete rupture of the temporary door **16**.

Also, the rigidification of the door by means of the borders **25** in the upper and lower panels **19** and **19'**, respectively, makes it convenient for the sampling artisan to enter and leave the car by climbing over the door, which is fully capable of supporting the weight of the artisan.

While, in the foregoing specification, a detailed description of the invention has been set down for the purpose of explanation thereof, many variations in the details herein given may be made by those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. In a temporary door for a freight vehicle,

(A) a fibrous body of generally planar, rectangular configuration,

(B) a plurality of flat straps secured to said body in spaced-apart relation parallel to the longer dimension of said body and generally coextensive therewith,

(C) a channel-shaped border perimetrically mounted on said body, and

(D) stitching securing said border to said body and straps at least in the border areas adjacent the ends of said straps.

2. The structure of claim **1** in which said stitching is wire.

3. The structure of claim **1** in which said straps and border are constructed of sheet metal.

4. The structure of claim **1** in which said border is defined by inner and outer sides arranged in parallel relation and connected by a longitudinally-extending bight portion, a bead in each side extending parallel to and spaced from said bight portion.

5. In a temporary door of the character described,

(A) a generally rectangular planar panel constructed of corrugated paperboard, with said panel having a core with the flutes thereof extending transverse of the panel length,

(B) a plurality of spaced-apart, flat metal straps positioned in contact with said core and extending parallel to the panel length and being generally coextensive therewith,

(C) a channel-shaped border extending perimetrically about said panel, and

(D) means securing said panel, straps and border together to place said straps under tension, said means including a deformation of said border for upsetting a portion of each strap end from a planar configuration.

6. In combination,

(A) a freight vehicle having a doorway defined by vertically-extending, spaced-apart door posts and a horizontally-extending floor,

(B) a door closure for said doorway positioned against the inside of said posts, said closure comprising a plurality of generally rectangular, planar panels arranged in edge-stacked relation, each panel comprising,

(1) a fibrous body of generally planar rectangular configuration,

(2) a plurality of flat straps secured to said body in spaced-apart relation parallel to the longer dimension of said body and generally coextensive therewith,

(3) a channel-shaped border perimetrically mounted on said body, said border being defined by inner and outer sides arranged in parallel relation and connected by a longitudinally-extending bight portion, a deformation in each side parallel to and spaced from said bight portion and extending outwardly from said side to space said side from said door posts, and

(4) stitching securing said border to said body at least in the border areas adjacent the ends of said straps,

(C) means securing said panels to said posts.

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