

[54] **TEMPORARY LOAD RETAINING
BARRICADE FOR THE DOORWAY OF A
FREIGHT CARRIER**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 250,526, May 5, 1972, abandoned.

[52] U.S. Cl. **160/368 G**

[51] Int. Cl. **E06b 5/00**

[58] Field of Search **160/368 G, 368**

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[57] **ABSTRACT**

There is disclosed a temporary load retaining barricade for the doorway of a freight carrier. The barricade includes a generally planar paperboard panel having corresponding fold and/or score lines which upon installation of the panel provides for an inwardly projecting floor flap as well as at least one inwardly projecting offset portion spaced above the floor flap for enveloping a reinforcing cross member of the barricade.

18 Claims, 15 Drawing Figures

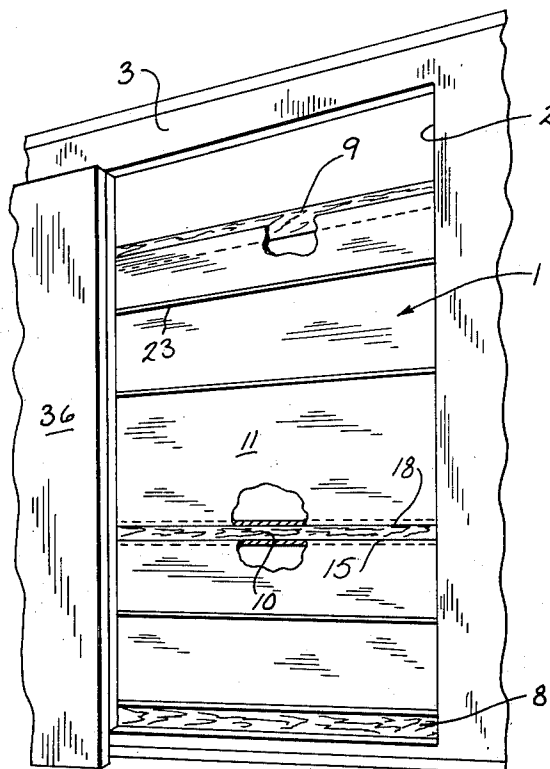


Fig. 1

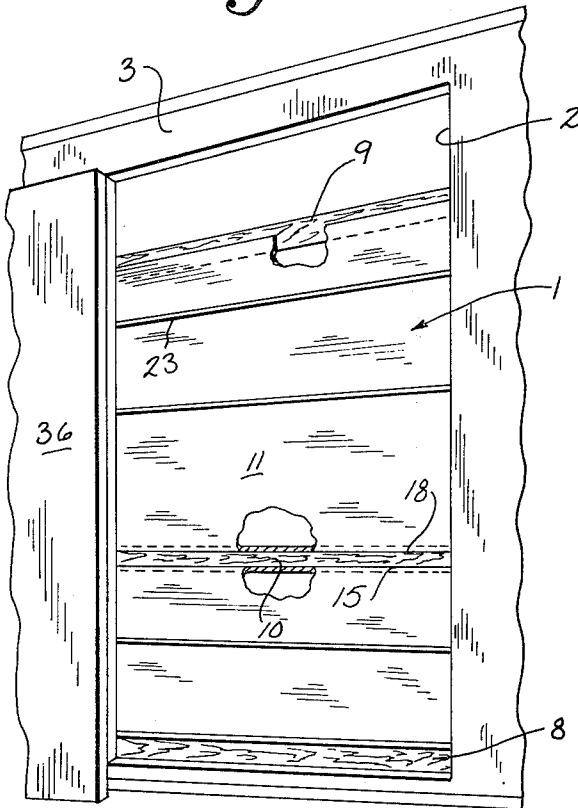


Fig. 2

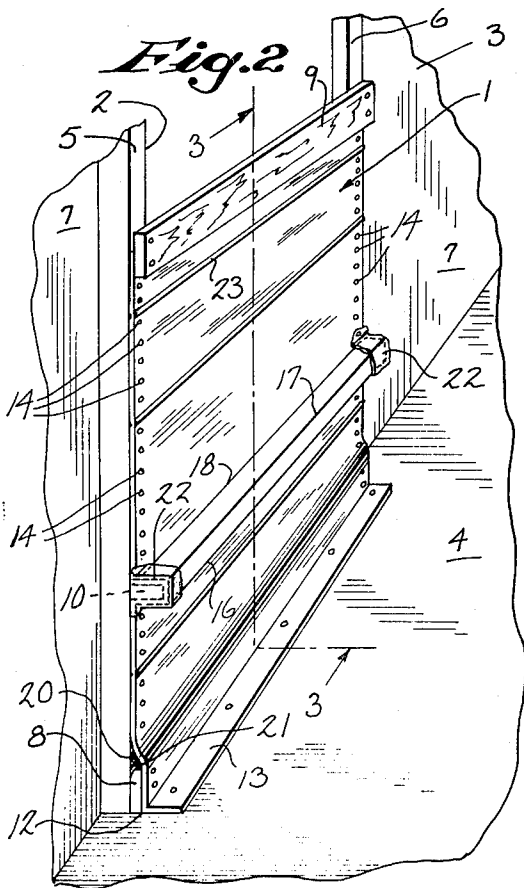


Fig. 3

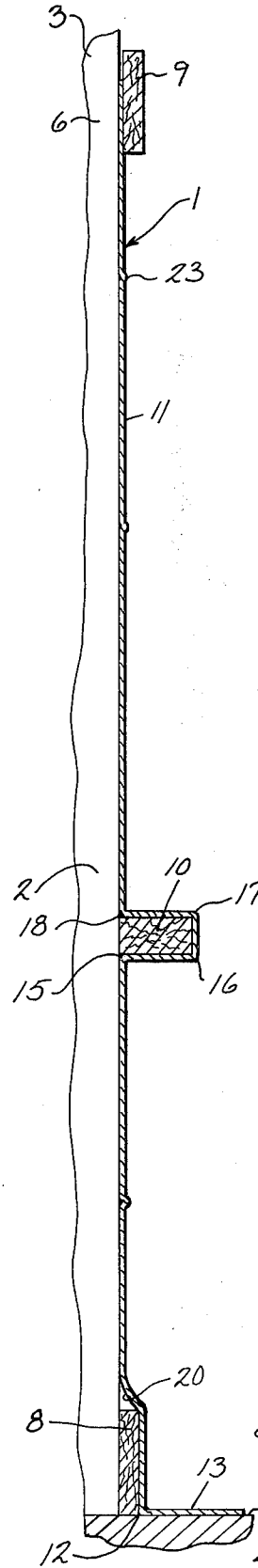


Fig. 4

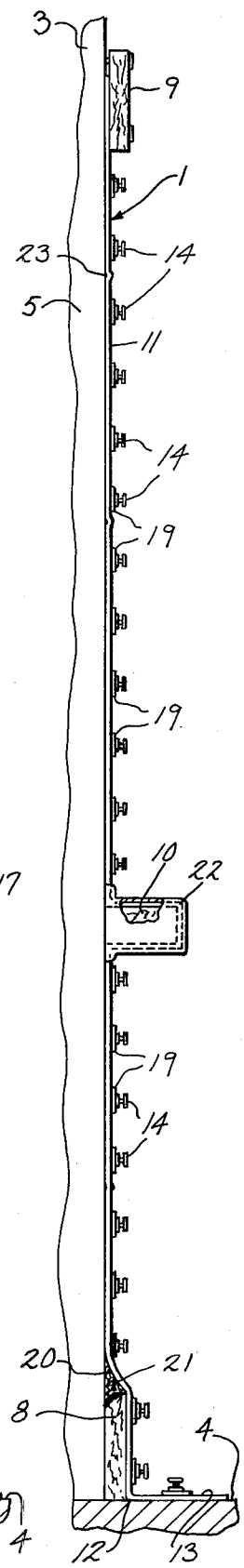


Fig. 5

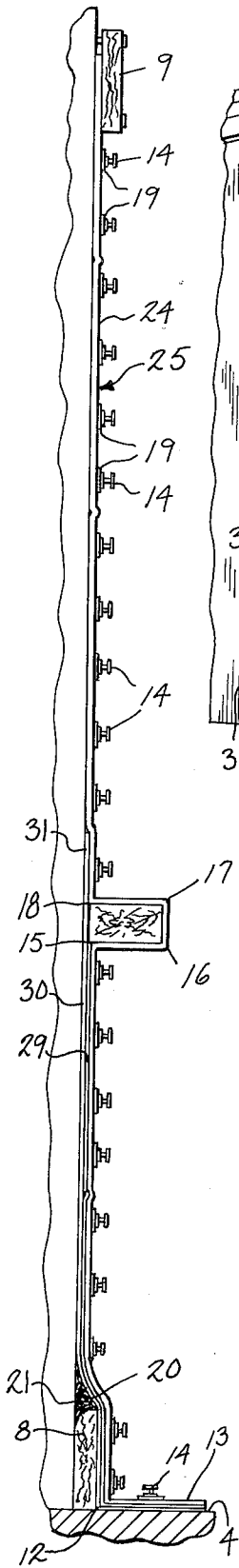


Fig. 6

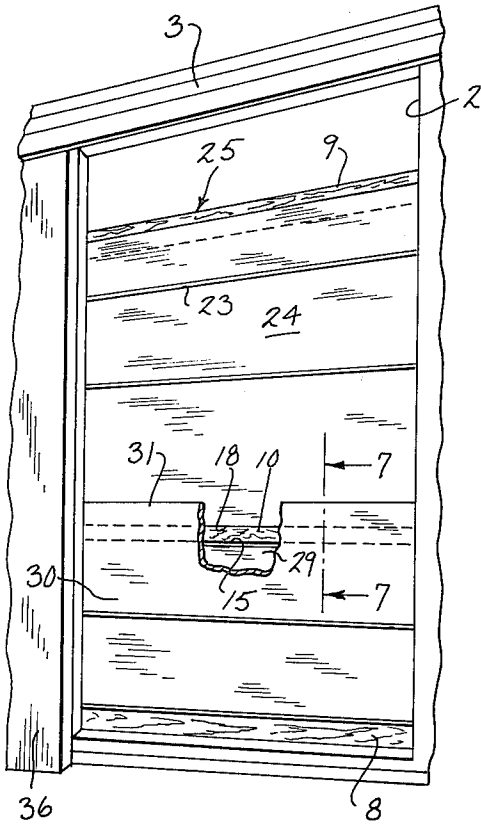


Fig. 9

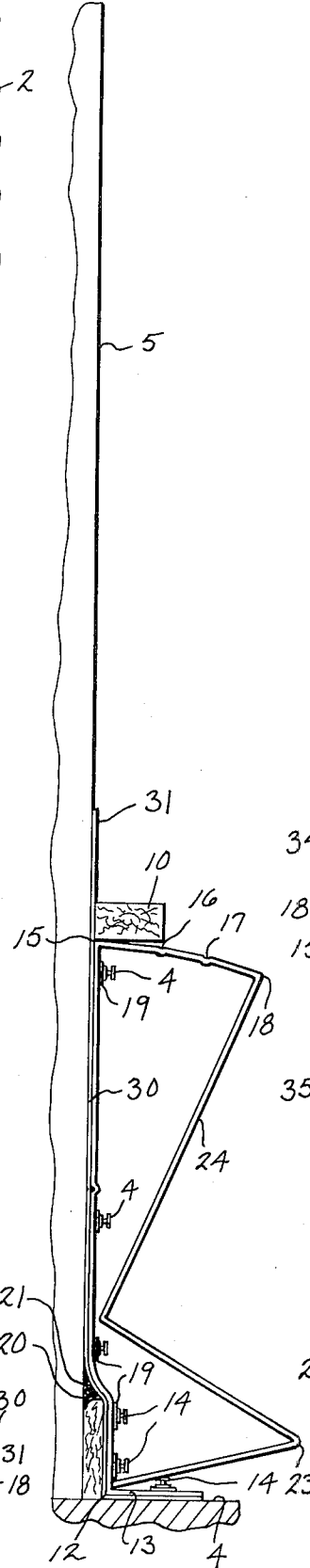


Fig. 10

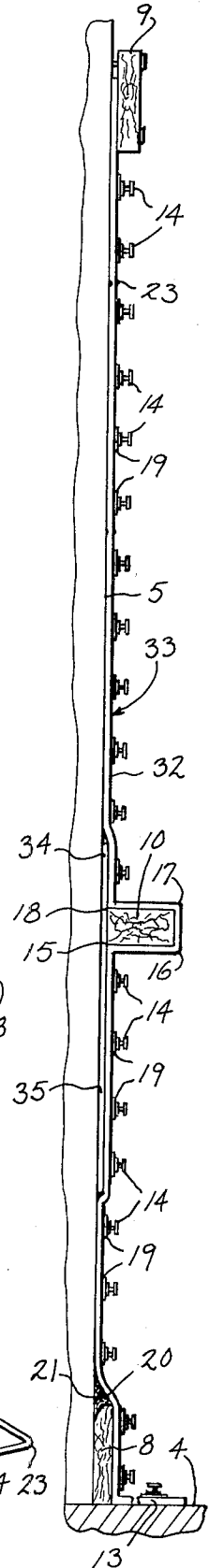


Fig. 7

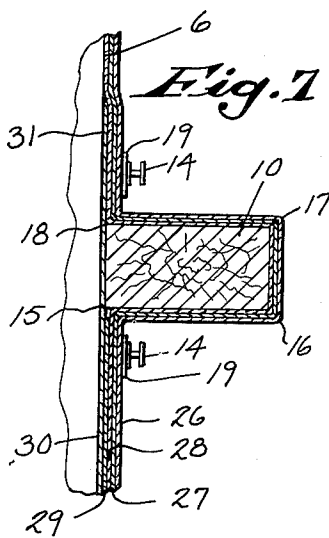


Fig. 8

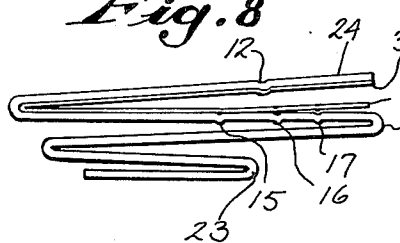


Fig. 11

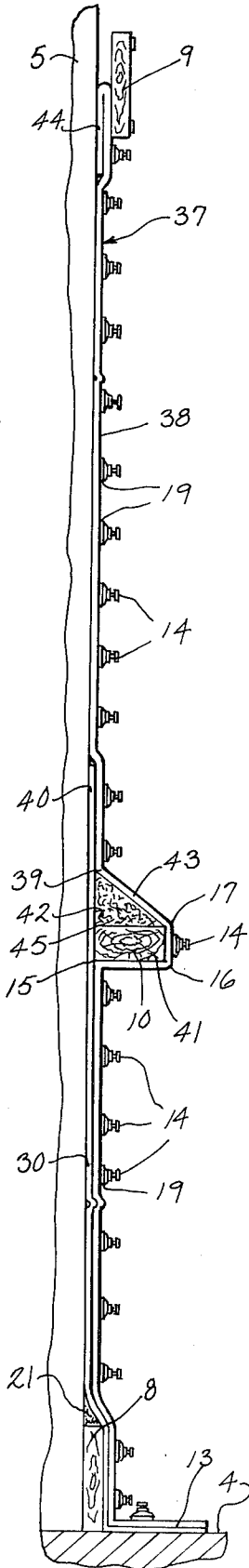


Fig. 14

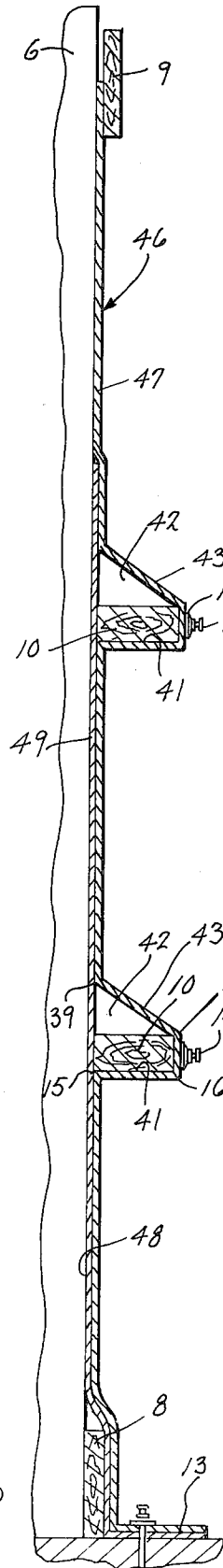


Fig. 15

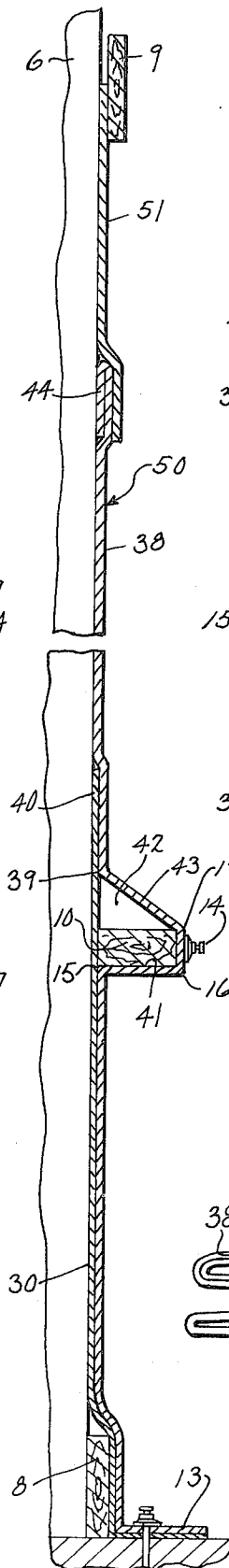


Fig. 12

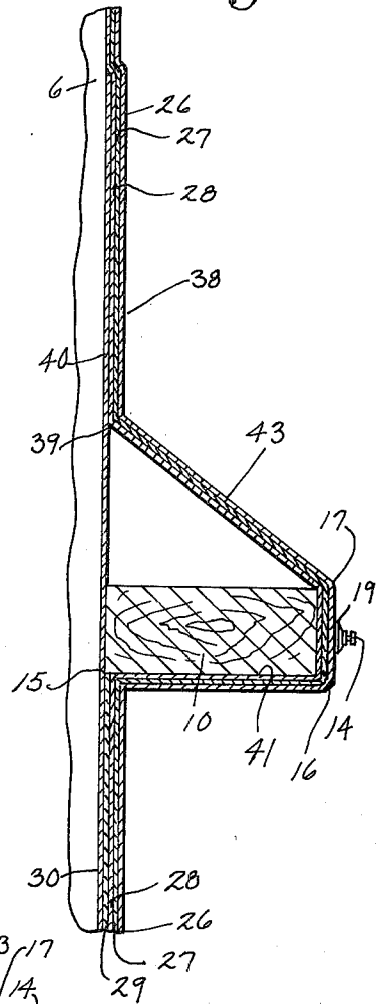
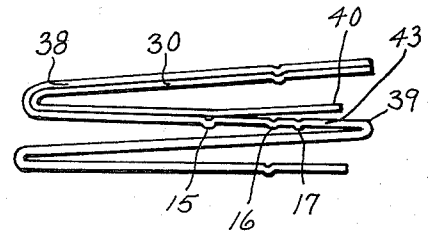


Fig. 13



TEMPORARY LOAD RETAINING BARRICADE FOR THE DOORWAY OF A FREIGHT CARRIER

BACKGROUND OF THE INVENTION

This application is a continuation-in-part of our co-pending application Ser. No. 250,526, filed May 5, 1972, entitled "Temporary Load Retaining Barricade For The Doorway Of A Freight Carrier and now abandoned."

The invention relates to a temporary load retaining barricade for the doorway of a freight carrier, such as a railway boxcar, to adapt the carrier for haulage of bulk grain and other commodities. Such barricades are sometimes called grain doors and are in addition to the regular outside sliding doors provided on the carrier.

Temporary load retaining barricades are installed across the doorway on the inside of the carrier and generally extend to a height of perhaps 6 to 7 feet leaving a fill opening thereabove. The barricades commonly in use include a panel fabricated of paperboard or a variety thereof reinforced with a plurality of horizontally extending, vertically spaced steel straps or bands. Such barricades further include a pry board installed at the bottom of the doorway and outwardly of the panel and a top board at the upper end and inside of the panel. Vertically extending wood laths are sometimes additionally employed to secure the opposed side edges of the panel between the pry board and top board.

The panel reinforced with a plurality of steel straps is installed across the carrier doorway by nailing at the opposed ends of the straps or extensions therefrom into the doorposts or adjacent wall structure. Proper operation of the panels under load is in large measure dependent on proper securement of the straps which require tension nailings to attain the degree of tautness necessary. Perhaps for lack of skill or possibly due to neglect, proper tautness of the straps is sometimes not attained or is subsequently lost under load. Hence, excessive bulging of the panel under load is not unusual and presents difficulties in closing and opening the regular outside doors of the carrier. When the barricade panels bulge against or into interfering relation with the regular outside sliding doors, operation of the latter sometimes requires special attention resulting in costly delay.

At the point of unloading, the barricades are rammed or cut to effect opening. In the instance of the panel reinforced with steel straps, the loose and broken straps present a hazard to the unloading personnel and the subsequent car clean-out personnel. The accumulation of spent or used panels with steel strapping can be disposed of by burying at considerable expense, or where law permits, it can be burned to reduce bulk. When the removed barricade panels can be burned to reduce the bulk, the steel straps remain and must be otherwise disposed of, usually after a substantial accumulation. Meantime, the accumulation of strapping becomes scattered, is unsightly, and always remains a hazard.

It is generally an object of this invention to provide a temporary load-retaining barricade or grain door which requires no steel strapping and so eliminates the problems attendant thereto, is less dependent on the skill and judgment of the installer for its proper installation and operation, and which remains competitive pricewise and in respect to the time required for installation. The temporary barricade of this invention offers

further advantage in regard to safety and time required for clean-out or removal after use.

SUMMARY OF THE INVENTION

Generally according to this invention, the temporary load retaining barricade for the doorway of a freight carrier includes a pry board installed at the lower end of the barricade and a top board at the upper end of the barricade. At least one reinforcing member is disposed intermediate the pry board and the top board. The barricade further includes a paperboard panel which extends between the pry board and the top board. The paperboard barricade panel is generally planar and is provided with an inwardly offset portion defining a pocket for enveloping the intermediate reinforcing member. The temporary barricade further includes seal means to preclude leakage from the carrier around the respective ends of the reinforcing member.

According to another aspect of the invention, the inwardly offset portion of the paperboard barricade panel generally defines an irregular trapezoid pocket for enveloping the intermediate reinforcing member.

DESCRIPTION OF THE DRAWING FIGURES

The drawings furnished herewith illustrate the best mode for carrying out the invention as presently contemplated and are described hereinafter.

In the drawings:

FIG. 1 is a perspective view with parts broken away showing the temporary retaining barricade of the invention across the doorway of a railway boxcar as viewed from outside of the car;

FIG. 2 is a perspective view showing the temporary barricade of FIG. 1 as viewed from inside of the car;

FIG. 3 is an enlarged vertical section taken generally on line 3—3 of FIG. 2;

FIG. 4 is an enlarged end view of the temporary barricade of FIG. 1;

FIG. 5 is a view generally similar to that of FIG. 4 and shows another form of sealing means that may be employed in connection with the reinforcing member;

FIG. 6 is a perspective view with parts broken away and generally similar to that of FIG. 1 and shows sealing means integral with the barricade panel as embodied in FIG. 5;

FIG. 7 is an enlarged detail section taken generally on line 7—7 of FIG. 6 and generally shows the reinforcing member and the enveloping barricade panel with the integral sealing means;

FIG. 8 is an end view of the barricade panel of FIG. 5 and shows how the same may be folded to provide for ease in handling for shipment and storage prior to its installation;

FIG. 9 is an end view and illustrates an intermediate step in the installation of the barricade of FIG. 5 to provide for the inclusion of the reinforcing member;

FIG. 10 is an end view generally similar to that of FIG. 5 and shows still another embodiment of barricade panel having integral sealing means for the reinforcing member;

FIG. 11 is an end elevational view showing an embodiment of the barricade panel which includes an irregular trapezoid pocket for enveloping the reinforcing member;

FIG. 12 is an enlarged detail section, generally similar to that of FIG. 7, for the barricade panel of FIG. 11;

FIG. 13 is an end view of the barricade panel of FIG. 11 shown in its folded condition for shipment and storage;

FIG. 14 is a sectional view showing a further embodiment of the invention wherein the barricade panel is reinforced by a pair of vertically spaced reinforcing members; and

FIG. 15 is a sectional view showing a still further embodiment wherein a vertical extension panel is provided at the upper end of the barricade.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

Referring to the drawings, the temporary retaining barricade 1 of this invention is shown installed across the doorway 2 of a railway boxcar 3 to adapt the car for carrying grain or other bulk commodity. The barricade 1 extends from the floor 4 of the car 3 to a desired height of perhaps 7 feet, and exceeds the width of the doorway 2 so as to overlap with the opposed vertical doorposts 5 and 6 forming a part of the inner wall 7 of the car. Since a boxcar 3 normally has doorways 2 on each of the opposed sides thereof, two such barricades 1 are ordinarily required to cooper the car for loading and haulage.

The barricade 1 generally includes a bottom or pry board 8, a top or inspector's board 9, an intermediate reinforcing member 10, and a paperboard panel 11. All of the elements 8 through 11 comprising barricade 1 exceed the width of the doorway 2 and overlap with the opposed doorposts 5 and 6.

In the event the opposed doorposts 5 and 6 inside of the car 3 are not in good enough condition to accept and hold nails, suitable upgrading or facing boards, not shown, are secured over the doorposts and extend upwardly from the floor 4 to at least the height of the barricade 1. When such are required, the upgrading or facing boards serve as the nailing surfaces for the barricade 1.

The bottom or pry board 8 may be a piece of lumber having a 1 inch by 6 inches section and is generally the first element of the barricade 1 to be installed. The pry board 8 spans the doorway 2 and is disposed with its lesser section dimension resting on the floor 4 and its wider section dimension flush against the opposed doorposts 5 and 6 where the pry board is secured by nails, not shown.

After the pry board 8 is secured across the doorway 2, the paperboard barricade panel 11 is installed. The panel 11 can be fabricated from a single relatively heavy ply of kraft paper, but a multiple ply laminate structure having plies of a lighter weight kraft paper is preferred. While a laminated panel of solid fiber plies is preferred in view of its relative strength in relation to thickness and for other reasons, the structure can, if desired, include one or more plies of corrugated paper. If desired, the paperboard panel 11 may also be reinforced with animal, vegetable, mineral, synthetic and/or metal fibers.

During fabrication, the paperboard panel 11 may be folded as desired on lines extending generally normal to and between the doorposts 5 and 6 so that the panel is more easily handled during storage and installation. The panel 11 is further provided with score lines during fabrication which generally parallel the fold lines and which provide for easier folding during installation for purposes more fully described hereinafter.

When installation of panel 11 is to proceed, a fold or crease 12 is made on a corresponding score line to provide for a relatively short length of floor flap 13 which is to project horizontally along the floor 4 toward the interior of the car 3. With the flap 13 disposed flush on the floor 4, the adjacent panel portion on the opposite side of fold 12 is disposed flush against the inner face of the pry board 8, and vertically above the pry board, against the opposed doorposts 5 and 6 as generally shown in FIG. 2. The respective sides or ends of the panel 11 are secured to the pry board 8 and corresponding doorposts 5 and 6 up to an intermediate height, as more fully explained hereinafter, by the nails 14.

The temporary barricade 1 includes a reinforcing member 10 intermediate its height which is incorporated into the barricade structure during installation. The reinforcing member 10 may be a piece of lumber having a 2 inches by 4 inches section which is enveloped on three sides by an inwardly offset portion of panel 11. At the intended height for the reinforcing member 10 relative to panel 11, the panel is provided with a series of parallel score and/or fold lines which are readily folded or creased to effect the envelopment of member 10. After the panel 11 has been secured by nailing to an intermediate height just beneath and adjacent to the lowest of the score or fold lines, the panel is folded inwardly on the lowest line at 15 to form a shelf-like support for receiving the reinforcing member 10. If the reinforcing member 10 is a lumber 2 inches by 4 inches section, it is placed with its lesser section dimension flush against the opposed doorposts 5 and 6. With the lumber 2 inches by 4 inches section reinforcing member 10 in place, the panel 11 is folded on the remaining score and/or fold lines at 16, 17 and 18 to complete the three-sided envelopment of the member. Except for the enveloping support provided by panel 11, the reinforcing member 10 can remain free of other securement relative to the panel 11 and the doorposts 5 and 6. After installation of the reinforcing member 10, nails 14 are driven through the barricade panel 11 and into the respective doorposts 5 and 6 just above and adjacent to the fold line 18, and thereafter, nailing of the balance of the panel upwardly may be resumed.

The top or inspector's board 9 is installed along the upper edge of the temporary barricade 1. The board 9 may be a 1 inch by 6 inches section piece of lumber generally similar to pry board 8. The top board 9 should overlap with and project above the upper edge of panel 11 where the board 9 is secured to the opposed doorposts 5 and 6 by nails, as shown. The top board 9 should project above the panel 11 and be visible from outside of the car 3 as indicated in FIG. 1, so that inspectors and other authorized personnel are aware of its presence and its availability for support of portable ladders used for obtaining samples and/or gaining entry to the coopered boxcar.

The pry board 8 and top board 9 may be secured to the opposed doorposts 5 and 6 with ordinary flat headed nails, because such nails are relatively easily removed with the corresponding boards when the temporary barricade 1 is rammed or otherwise opened for unloading or during cleanup after car 3 is unloaded. The nails 14, however, for securing the barricade panel 11 to the floor 4, pry board 8 and the respective doorposts 5 and 6 are double headed, as shown, with the inner head effecting securement of the panel and the spaced-

apart outer head providing for easy clawing during cleanup after the car 3 is unloaded. If desired, the inside surface of panel 11 may be imprinted or provided with other indicia for indicating the desired location for driving the nails 14. A washer 19 is used with each nail 14 so that the stress load at the nails resulting from tension imposed on the panel 11 by the loaded car is substantially spread to reduce the number of nails that might otherwise be required. If desired, special nails may be employed wherein the inner head is enlarged diametrically to form a combined washer-nail and thereby eliminate the need for separate washers 19.

Where the relatively stiff panel 11 extends from the pry board 8 onto the respective doorposts 5 and 6, a small generally triangular hole or gap 20 results immediately above the rectangular section pry board. The gap 20 is readily sealed by caulking paper or other suitable wadding 21, a portion of which is wedged between the pry board 8 and the respective doorposts 5 and 6 at the time of installation of the pry board. Enough of the caulking paper 21 is allowed to project upwardly above the pry board 8 to generally fill and seal the gap 20. If the section of the pry board were to be altered, it is conceivable that the gap 20 could be eliminated to preclude the need for caulking paper or wadding 21.

Theoretically, when the relatively stiff panel 11 closely envelops three sides of the reinforcing member 10 and supports the member 10 so that its fourth side is held flush against the respective doorposts 5 and 6, a seal around the ends of the enveloped reinforcing member ought to be unnecessary. As a practical matter, however, sealing means are probably necessary and therefore provided. Thus, when the reinforcing member 10 is being installed, caulking paper or other suitable wadding 22 may be wedged between the reinforcing member and the respective doorposts 5 and 6 and is caused to drape over the corresponding ends of the enveloped reinforcing member as generally shown in FIGS. 2 and 4.

The temporary retaining barricade 1 of FIGS. 1 through 4 is easily assembled on the car 3 by one individual. After installation of the temporary barricades 1 for a given car 3 is complete, the enveloped reinforcing member 10 serves as a step for the installer to gain easy exit from the car over the corresponding top board 9.

Fill spouts, not shown, for loading the coopered boxcars 3 are not always located at a height compatible with the top board 9. Some fill spouts require a low mounting relative to the doorway 2 for the filling operation. For the eventuality of the need for a lower fill spout mounting, the panel 11 is provided with a fold or score line to provide for easy folding at 23 in spaced relation beneath the upper edge of the panel. A piece of lumber, not shown, generally like that of top board 9, is disposed with its upper edge immediately beneath the fold or score line 23 and its respective ends are nailed to the opposed doorposts 5 and 6. The portion of panel 11 above the fold or score line 23 is thereafter temporarily folded inwardly over the piece of lumber to provide for mounting of the fill spout onto the enveloped piece of lumber. After the car 3 is filled to the desired height and the fill spout removed, the portion of panel 11 above the fold or score line 23 is pivoted upwardly and secured to the opposed doorposts 5 and 6 and the top or inspector's board 9 is then added to the barricade structure. The lower fill spout mounting board beneath the fold or score line 23, though superfluous rela-

tive to the barricade 1, is simply left in the loaded car 3.

In the embodiment of FIGS. 5 through 9, the panel 24 of temporary barricade 25 is a solid fiber, multiple-ply laminate of kraft paper. In panel 24, three plies 26, 27 and 28 are full size relative to the panel. In the detail of FIG. 7, the three plies 26, 27 and 28 are shown to closely envelop the reinforcing member 10 on three sides and to extend both upwardly and downwardly therefrom. A fourth intermediate ply 29 is disposed outwardly relative to the full plies 26, 27 and 28 and is substantially narrower or shorter as compared to the height of panel 24 and extends downwardly generally from the fold or score line 15, as shown in FIG. 7. A fifth outer ply 30 is also narrower or shorter relative to the height of panel 24 and extends downwardly from a location above the fold or score line 18 as also shown in FIG. 7. The plies 29 and 30 both extend all the way to the bottom edge of panel 24. Outer ply 30 is laminated to the panel 24 only to the height of intermediate ply 29 and projects freely or unlaminated above the ply 29 to provide a seal flap 31 more fully described hereinafter. The intermediate ply 29 and outer ply 30 extend over the full width of the panel 24 as best shown in FIG. 6. Thus, the outer or sealing ply 30, as well as the intermediate ply 29, are additive to the full size plies 26, 27 and 28 beneath the reinforcing member 10 to strengthen or reinforce the lower upright portion of panel 24 and its floor flap 13.

FIG. 9 shows an intermediate stage in the installation of panel 24 and shows the panel folded inwardly relative to the car 3 on fold or score line 15 to form a shelf-like support for receipt of the reinforcing member 10. The unlaminated seal flap 31 of outer ply 30, however, is free to extend upwardly flush with the opposed doorposts 5 and 6 above the fold or score line 15. When the reinforcing member 10 is disposed on the shelf-like support, it remains inside the seal flap 31. With continued installation of panel 24, the reinforcing member 10 becomes fully enveloped as generally shown in FIG. 7, with the three plies 26, 27 and 28 covering the three sides of member 10 which project into car 3 and the seal flap 31 of ply 30 covering the remaining outer side of member 10. With the seal flap 31 sandwiched between the reinforcing member 10 and the respective doorposts 5 and 6, no way remains for leakage from the car 3 around the ends of member 10. Since the seal flap 31 extends above the reinforcing member 10, the upper portion of the flap can be secured by nailing as shown in FIG. 7. As viewed from outside of the boxcar 3, the reinforcing member 10 is completely hidden from view by the seal flap 31 as shown in FIG. 6. As earlier explained relative to panel 11 in the embodiment of FIGS. 1 through 4, the reinforcing member 10 may remain free of all securement relative to panel 24 except for the enveloping support provided by the panel. When the boxcar 3 is under load, even bumping and humping maneuvers will not cause the reinforcing member 10 to move appreciably relative to panel 24.

FIG. 8 illustrates one mode for folding the panel 24 for easier handling during shipment and storage prior to its installation in a temporary barricade 25.

It has been determined that when a car 3 is loaded with grain or other bulk commodity, the location of maximum stress on the temporary barricade is spaced at some distance above the floor. The height or location of maximum stress relative to the floor will vary

depending on the type of grain or other commodity, size of car, and other factors. Generally, however, for most cars loaded to their usual capacity with grain, the location of maximum stress on the barricade will fall between 28 inches and 36 inches above the floor. Good results are generally attained if the reinforcing member 10 is placed at about 32 inches above the floor which for most cars is at or near the location of maximum stress. Thus, at or near the location of maximum stress on the temporary barricade as imposed by a load, the stress is assumed by the reinforcing member 10 in compression against the doorposts to reinforce and so relieve the tensile load on the barricade panel at that location.

While the stress on the barricade installation beneath the location of maximum stress is somewhat reduced, it nevertheless remains substantial. Above the location of maximum stress, the stress falls off rather rapidly toward the upper edge of the barricade. Thus, the barricades 25 of FIGS. 5-9 and its solid fiber multiple ply laminate panel 24 represent a relatively efficient distribution of material in relation to the stress imposed thereon by the load.

In the embodiment of FIG. 10, the barricade panel 32 of temporary barricade 33 includes the seal flap 34 similar in some respects to the seal flap 31 of FIGS. 5 through 9. Intermediate its height, the panel 32 includes an appendage sheet 35 on the outer face of the panel. The appendage sheet 35 may comprise one or more plies and, as shown in the assemblage of FIG. 10, extends vertically relative to panel 32 from a location intermediate the pry board 8 and reinforcing member 10 to a location above member 10. The sheet 35 extends the full width of panel 32 but is laminated thereto only beneath the fold or score line 15 to leave the seal flap 34 free to extend upwardly and outwardly of the reinforcing member 10. The reinforcing member 10 is thus enveloped on all four sides by the barricade panel 32 similarly to panel 24 in the embodiment of FIGS. 5 through 9 to preclude leakage from the car 3 around the ends of member 10. Since the appendage sheet 35 extends beneath the reinforcing member 10, it also serves to strengthen or reinforce the lower vertical upright portion of the barricade panel 32 to generally preclude bulging under load beneath the member 10 to the point of possible interference with or jamming against the regular outside sliding door 36 of the car 3.

The doorway barricade 37 of FIGS. 11 and 12 includes the paperboard panel 38 similar in many respects to the panel 24 of barricade 25 shown in FIGS. 5-9. As in the case of panel 24, the barricade panel 38 may be a kraft paper laminate having three adjacent plies 26, 27 and 28 which extend to the full height of the panel. As shown in FIG. 12, a fourth intermediate ply 29 is disposed outwardly of the full plies and extends downwardly generally from the fold or score line 15. A fifth or outer ply 30 of panel 38 extends downwardly from a location above the fold or score line 39 as generally shown in FIG. 12. The plies 29 and 30 both extend all the way to the bottom edge of panel 38, and similarly as in panel 24, the plies 29 and 30 extend to the full width of panel 38 and are laminated thereto to the height of intermediate ply 29 to strengthen the lower portion of panel 38 beneath the reinforcing member 10. Above the height of the intermediate ply 29, the outer ply 30 of panel 38 projects freely or remains unlaminated to form the seal flap 40.

The mode of installation of temporary barricade 37 across the doorway 2 of car 3 is generally similar to that of barricade 25, at least through the placement of the reinforcing member 10 on the shelf-like support which derives when folding the panel 38 inwardly on score line 15 similarly as shown in FIG. 9. The lesser section dimension of the reinforcing member 10 is placed flush against the opposed doorposts 5 and 6 with the upright seal flap 40 secured between the member and the doorposts. Thereafter the panel 38 is further folded on score lines 16, 17 and 39 to envelop the reinforcing member 10. The distance between score line 17 and score line 39 of panel 38 exceeds the longer section dimension of the member 10, however, so that upon folding on score line 39, the panel 38 engages the upstanding seal flap 40 at a location above the member 10 to generally form an irregular trapezoidal pocket 41 for enveloping the reinforcing member. With the reinforcing member 10 in place in the pocket 41, a generally triangular void or space 42 remains inside the seal flap 40 and between the member 10 and the angularly disposed panel portion 43 extending between the score lines 17 and 39. The upper end of panel 38 may also be provided with a short overlap portion 44 for added strength and rigidity.

The irregular trapezoidal pocket 41 would ordinarily allow the reinforcing member 10 a greater degree of freedom for endwise movement than would the close envelopment contemplated for panel 24 of FIG. 5. Hence a single nail 14 is driven through the panel 38 into the inwardly disposed face of member 10 to restrain the member against movement within the pocket 41. The respective ends of the triangular space 42 are closed with a suitable caulking paper or wadding 45 to preclude undue leakage into the space closed outwardly by the seal flap 40.

The angularly disposed portions 43 of panel 38 appears to act as a sort of bracing member. It seems to maintain the reinforcing member 10 in position normal to the doorposts 5 and 6 even when the car 3 rolls empty for considerable distances from the cooperating site to the loading site. If, after rolling empty to the loading site the inner face of reinforcing member 10 is caused to droop somewhat, the weight imposed on angular panel portion 43 during loading forces the member 10 back to the intended position normal to the doorposts. The bracing capability of angular panel portion 43 also aids favorably under load to contain the bulging of panel 38 above the reinforcing member 10 within acceptable limits. FIG. 13 illustrates a mode for folding the panel 38 for handling during shipment and storage.

The temporary barricade 37 of FIG. 11 is intended for doorways 2 having a width of up to 7 feet. FIG. 14 illustrates a temporary barricade 46 which is adapted to resist the correspondingly greater stresses encountered in a doorway 2 having a width of 8 feet.

The temporary barricade 46 requires use of a pair of vertically spaced reinforcing members 10. To accommodate the vertically spaced members 10, the paperboard panel 47 is adapted to provide corresponding irregular trapezoidal pockets 41. In the case of barricade 46 for the doorway 2 having a width of 8 feet, the lower pocket 41 is disposed at a lesser height than provided for the pocket of barricade 37 for a lesser width doorway and the upper pocket 41 is at a somewhat greater height. Accommodation of the vertically spaced rein-

forcing members 10 of barricade 46 at approximately 2 feet and 4 feet from the floor 4 of car 3 is contemplated to contain the bulging under load within acceptable limits.

The paperboard panel 47 of barricade 46 includes an outer ply 48 which is laminated from the bottom of the panel up to the lower of the two pockets 41 to reinforce the portion of the panel beneath the lower reinforcing member 10 along with the floor flap 13. The upper portion of outer ply 48 remains free and unlaminated to provide a relatively long seal flap 49 which extends upwardly past the two vertically spaced pockets 41 to close the outer side of the two pockets.

Boxcars 3 are generally loaded to their approximate limit of 130,000 pounds. For certain more bulky grains such as oats, the weight capacity of the car 3 would place the level of the grain in the car too near or above the top of the several temporary barricades hereinbefore described. With reference to FIG. 15, the temporary barricade 50 is shown to include the panel 38 of FIG. 11 as combined with an extension panel 51 at the upper end thereof. Like panel 38, the extension panel 51 may comprise a laminated paperboard member free of steel bands or strapping. As installed, the lower end of extension panel 51 overlaps inwardly with the upper overlapped portion 44 of panel 38 and extends upwardly therefrom. Nails 14, now shown, secure the panel 51 to the opposed doorposts 5 and 6 of the car 3. The installation of temporary barricade 50 is complete with a top board 9 at the upper end of the extension panel 51 in a manner to make it visible from outside of the car 3.

The temporary load retaining barricade of this invention is easily and safely installed by one man. Proper operation of the barricade is virtually assured when the prescribed number of nails 14 secure the barricade panel. The embodiments which have been tested resulted in relatively few instances of excess bulging of the barricade panel to interfere with or jam the regular outside sliding door 36 of the car 3.

After their use and removal, the paperboard panels may be recycled if desired to afford a possible opportunity for cost saving and avoid the problems attendant with burning and the costs of burying. However, recycling may not be possible if certain adhesives and/or reinforcement fibers incompatible to known recycling processes are used for fabrication of the panel. As a further factor affecting cost, the reinforcing member 10 is re-usable since its securement in the barricade can be limited to the enveloping support provided by the barricade panel.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. In a temporary load retaining barricade for the doorway of a freight carrier, a pry board at the lower end of the barricade, a top board at the upper end of the barricade, at least one reinforcing member intermediate the pry board and the top board, and a generally planar paperboard panel extending between the pry board and the top board and having an inwardly offset portion forming a trapezoidal cavity enveloping the intermediate reinforcing member, said trapezoidal cavity formed by the inwardly offset portion of the paperboard panel includes a lower wall generally normal to

the doorway for seating the reinforcing member and an opposed upper wall disposed angularly relative to the doorway.

2. In a temporary load retaining barricade for the doorway of a freight carrier, a pry board at the lower end of the barricade, a top board at the upper end of the barricade, a lumber two-by-four reinforcing member intermediate the pry board and the top board, and a generally planar paperboard panel extending between the pry board and the top board and having an inwardly offset portion forming a trapezoidal cavity enveloping the intermediate reinforcing member, said lumber reinforcing member having its longer section dimension disposed normal to the doorway, said trapezoidal cavity formed by the inwardly offset portion of the paperboard panel includes a lower wall generally normal to the doorway for seating the lumber two-by-four and an intermediate inner wall generally paralleling the doorway to maintain the lesser section dimension of the lumber two-by-four against the doorposts of the doorway and an upper wall which extends angularly upwardly from said inner wall, said angularly disposed upper wall of the cavity leaving a generally triangular void above the lumber two-by-four, and sealing means to preclude leakage from the carrier, said sealing means including a seal flap forming a part of the paperboard panel and which extends upwardly outside of the lumber two-by-four to close the trapezoidal cavity, and a suitable caulking material to generally close the ends of the triangular void, said caulking material serving to minimize leakage into the triangular void to preclude undue pressure on the seal flap.

3. For use in a temporary load retaining barricade for the doorway of a freight carrier, a paperboard barricade panel for installation across the inside of the doorway of the carrier, said panel having corresponding fold and/or score lines which upon installation of the panel provide for a floor flap at the lower end of the panel to project inwardly relative to the carrier and at least one inwardly projecting offset portion spaced above the floor flap to form a cavity to envelop a corresponding reinforcing member of the barricade, said panel comprises a multiple ply laminated structure, and at least the outermost ply on the side of the panel intended to face outwardly relative to the carrier is laminated to the panel only beneath the offset portion formed during installation of the panel, said ply having an unlaminated portion which upon installation of the panel extends upwardly beyond the offset portion and is disposed outwardly of the reinforcing member and closes the cavity to form a sealing means and thus preclude leakage from the carrier.

4. The invention as set forth in claim 3 wherein the laminated portion of the outermost ply extends to the bottom edge of the panel and serves to reinforce the lower portion of the panel beneath the offset portion.

5. In a temporary load retaining barricade for the doorway of a freight carrier, a pry board at the lower end of the barricade, a top board at the upper end of the barricade, at least one reinforcing member intermediate the pry board and the top board, a generally planar paperboard panel extending between the pry board and the top board and having an inwardly offset portion forming a cavity enveloping the intermediate reinforcing member, and sealing means disposed outwardly of the reinforcing member, said paperboard panel comprises a multiple ply laminate and the outer ply of the

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panel is laminated only beneath the inwardly offset portion of the panel with the balance of said outer ply remaining unlaminated, said unlaminated portion of the outer ply being disposed outwardly of the reinforcing member and serving as the sealing means to preclude leakage from the carrier.

6. The invention as set forth in claim 3 wherein the reinforcing member is disposed between 28 inches and 36 inches above the floor of the freight carrier.

7. The invention as set forth in claim 3 wherein the reinforcing member is disposed 32 inches above the floor of the freight carrier.

8. The invention as set forth in claim 3 wherein a pair of vertically spaced reinforcing members are disposed intermediate the topboard and the pry board and the paperboard panel includes corresponding offset portions forming cavities enveloping the reinforcing members, and wherein the sealing means comprise a seal flap forming a part of the paperboard panel and which extends between and closes both of the spaced cavities.

9. The invention as set forth in claim 3 wherein the offset portion of the panel enveloping the reinforcing member comprises a trapezoidal cavity.

10. The invention as set forth in claim 3 wherein the reinforcing member is a lumber two-by-four having its longer section dimension disposed normal to the doorway.

11. The invention as set forth in claim 5 wherein the inwardly offset portion of the paperboard panel forms a generally rectangular cavity closely enveloping the lumber reinforcing member.

12. The invention as set forth in claim 5 wherein the inwardly offset portion of the paperboard panel forms an irregular trapezoidal cavity enveloping the lumber reinforcing member.

13. For use in a temporary load retaining barricade for the doorway of a freight carrier, a paperboard barricade panel for installation across the inside of the doorway of the carrier, said panel having corresponding fold and/or score lines which upon installation of the panel provide for a floor flap at the lower end of the panel to project inwardly relative to the carrier and at least one inwardly projecting offset portion spaced above the floor flap to form a cavity to envelop a corresponding reinforcing member of the barricade, said panel further including sealing means comprising at least a single ply of paperboard on the side of the panel facing outwardly upon installation, said ply being laminated to the panel

only beneath the offset portion formed during installation of the panel and said ply having an unlaminated portion which extends upwardly beyond the offset portion, the unlaminated portion of said ply being disposed outwardly of the reinforcing member during installation of the panel to close the cavity for enveloping said member to thus preclude leakage from the carrier.

14. The invention as set forth in claim 13 wherein the fold and/or score lines providing for the offset portion upon installation of the panel form a generally rectangular cavity for enveloping a reinforcing member.

15. The invention as set forth in claim 13 wherein the fold and/or score lines providing for the offset portion upon installation of the panel form a generally irregular trapezoidal cavity having a generally horizontal lower wall forming a seat for support of a reinforcing member.

16. For use in a temporary load retaining barricade for the doorway of a freight carrier, a paperboard panel for installation across the inside of the doorway of the carrier, said panel having corresponding fold and/or score lines which upon installation of the panel provide for a floor flap at the lower end of the panel to project inwardly relative to the carrier and a pair of inwardly projecting offset portions spaced above the floor flap to form vertically spaced cavities for enveloping corresponding reinforcing members of the barricade, said panel comprises a multiple ply laminated structure, and at least the outermost ply on the side of the panel intended to face outwardly relative to the carrier is laminated to the panel only beneath the lower of the pair of offset portions formed during installation of the panel, said outermost ply having an unlaminated portion extending upwardly and comprising a seal flap for closing both of the spaced cavities outwardly of the reinforcing member to preclude leakage from the carrier.

17. The invention as set forth in claim 16 wherein the fold and/or score lines providing for the vertically spaced offset portions upon installation of the panel form generally rectangular cavities for enveloping reinforcing members.

18. The invention as set forth in claim 16 wherein the fold and/or score lines providing for the vertically spaced offset portions upon installation of the panel form generally irregular trapezoidal cavities each of which has a generally horizontal lower wall forming a seat for support of a reinforcing member.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 3,884,287

DATED : May 20, 1975

INVENTOR(S) : Donald L. Riviere & Paul M. Thomsen

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, Line 22, Delete "hasa" and substitute therefor
---has---;

Column 6, Line 13, Delete "downwadly" and substitute
therefor ---downwardly---;

Column 8, Line 41, Delete "cooperating" and substitute
therefor ---coopering---;

Column 9, Line 27, Delete "now" and substitute therefor
---not---;

Column 9, Line 37, Delete "teated" and substitute therefor
---tested---;

Column 10, Line 41, Delete "floop" and substitute therefor
---floor---;

Column 11, Lines 7, 10, 13, 21 and 24, Delete the numeral "3",
each occurrence, and substitute therefor
---5---;

Column 11, Lines 28 and 32, Delete the numeral "5", each
occurrence, and substitute therefor
---10---;

Signed and Sealed this

ninth Day of September 1975

[SEAL]

Attest:

RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks