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GRAIN DOOR

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2 Sheets-Sheet 2

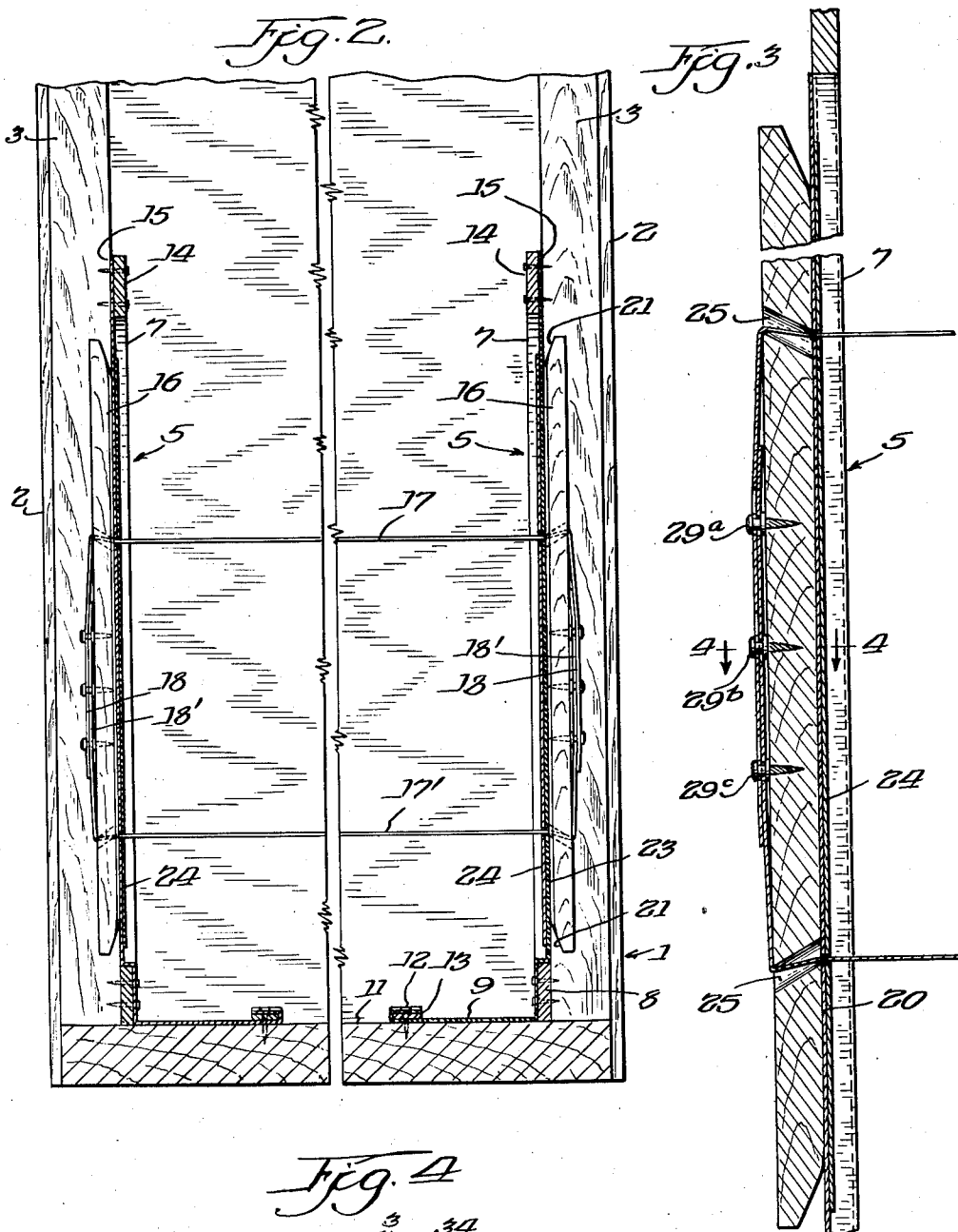
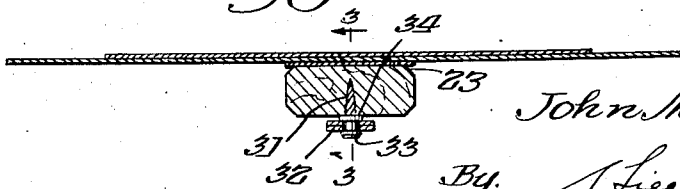


Fig. 4



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2,830,659

GRAIN DOOR

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11 Claims. (Cl. 160—87)

The invention relates generally to closure structures for railway cars and the like, and more particularly to a novel harness construction for use with such type of closure structures.

The present invention is directed to a harness for use on grain doors and the like of the type illustrated in the co-pending application of myself and Melvin E. Ross, Serial No. 350,544, filed April 23, 1953, which became Pat. No. 2,803,299 on August 20, 1957 wherein the closure members comprise suitable sheets of material which are extended across the respective doorways at opposite sides of a railway car and utilizing a harness structure extending between opposite closure members, whereby the effective span width of the closure member is materially reduced.

The present invention has among its objects the production of a novel harness structure which may utilize reinforcing elements of wood construction, adapted to be connected by suitable tie members such as steel strapping, which is suitably anchored to the wood reinforcing members at each side of the car.

Another object of the invention is the production of such a harness structure utilizing a wooden beam adapted to cooperate with strapping or the like which is so designed that the openings in the beam through which the straps extend are effectively sealed with respect to grain or other material which would have a tendency to flow through such openings, the construction being such that a snubbing action is applied to the straps, tending to reduce stresses on the means for anchoring the straps to the beam.

Another object of the invention is the production of a novel harness structure in which the anchoring means is so constructed that the connecting strapping or the like is interlocked in a novel manner with the anchoring means on the beam, thereby substantially eliminating the possibility of accidental displacement or disengagement of the anchored straps from the anchor means and which may be readily designed to provide a means of adjusting the effective length of the strapping whereby a strap of a fixed length may be so attached to the respective beams as to provide an adjustment of the effective strap length.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a front elevational view of a portion of the exterior of a railway car door with the closure and harness structure mounted thereacross, and with parts thereof broken away;

Fig. 2 is a sectional view through oppositely disposed mounted closure structures taken approximately on the line 2—2 of Fig. 1, and with parts thereof broken away;

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Fig. 3 is a vertical sectional view through the harness structure taken approximately on the line 3—3 of Fig. 4, and with parts thereof broken away;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is an isometric view of a pair of strap ends and the anchoring means carried by the reinforcing beam;

Fig. 6 is a vertical sectional view through a portion of the reinforcing beam taken approximately on the line 6—6 of Fig. 7, and with parts thereof broken away;

Fig. 7 is a front elevational view of the structure illustrated in Fig. 6 approximately as seen from the line 7—7 of Fig. 6, and with a part thereof broken away; and

Fig. 8 is a perspective view of a modified reinforcing beam, and with a part thereof broken away.

The present invention contemplates the utilization of a reinforcing harness structure which is so designed that a wooden reinforcing beam may be employed, to which is secured one or more tie straps which are adapted to extend between the opposed reinforcing beams at opposite sides of the car. In such construction, the cross tie strap or straps may pass through openings in the reinforcing member with the free ends of the strap secured to suitable anchoring means carried by the reinforcing beam at the exterior face thereof. As railway car doors vary in width, the anchoring means for the straps is so designed that an adjustment may be readily provided for varying the effective length of the strap extending between opposite reinforcing beams, permitting the same strap to be employed with cars of different widths.

In the use of the closure structures of the type here involved, it has been found that oftentimes there is a tendency for the strap end to accidentally become disengaged from the anchoring means, particularly prior to the loading of the car and full tensioning of the straps, and the present invention also provides novel means for anchoring the strap ends to the beams, whereby the possibility of accidental disengagement is substantially eliminated. While somewhat similar closure arrangements have been heretofore employed, as for example, that illustrated in the co-pending application heretofore referred to, metal channel members have been employed as the reinforcing member. Where metal reinforcing members are employed a suitable slot may be readily produced in the member through which the strap may extend, whereby the slot may be merely slightly larger than the cross section of the strap to permit ready insertion through the member with relatively slight possibility of leakage of grain or other material through such opening. Obviously, however, a hole of such size cannot readily be formed in a wooden member, so that practical considerations more or less dictate the use of a circular hole of a diameter to readily receive the strap, which hole may be easily formed in the wooden reinforcing member. However, with such an opening through the reinforcing member the problem of grain seepage or leakage becomes of importance and provision must be made for effectively sealing the opening to prevent leakage of grain therethrough. In the present invention this problem is overcome without employing any additional elements other than the strapping and the beam itself, with the relationship of the hole through the beam being so shaped and arranged that the elements themselves form an effective seal, such construction also providing a snubbing action on the strapping tending to relieve the strap anchoring means from a portion of the tension loads on the strap.

Referring particularly to Figs. 1, 2 and 3, the reference numeral 1 indicates generally a portion of a railway car including side walls 2 and having oppositely disposed doorways 3 therein, each doorway being adapted to be closed by the usual sliding freight car door 4. Extending

across and partially closing each of the doorways 3 is a closure structure indicated by the numeral 5 which may be generally constructed similar to that illustrated in the copending application heretofore referred to, each closure member 5 including a sheet of material 6 formed from paper or other suitable material, as for example, a laminated structure utilizing a plurality of plies of paper between which is positioned a ply of woven fiber glass or the like, the details of construction of the sheets 5 forming no part of the present invention. The vertical edges 7 of each sheet are suitably secured to the adjacent side walls of the car and extending along the car floor and spanning the doorway is a board 8, the lower edge portion 9 of the sheet being positioned on the car floor 11 and secured thereto by nails 12 or other suitable means passing through the sheet 5 and a suitable reinforcing strip 13, with the lower edge portion of the sheet partially rolled around the strip 13 as illustrated in Fig. 2. Likewise a board 14 secured at its ends to the car side walls may be positioned adjacent the upper edge 15 of the sheet. As in the case of the sheets 5, the details of the mounting to the doorway structure forms no part of the present invention which may be readily utilized with closure structures of widely varying constructions.

Positioned at the outer ends of each of the sheets 5 is a generally vertically extending reinforcing member or beam 16, the latter being substantially equally spaced from the adjacent door jambs and halves the effective span of the sheet 5. As shown in Figs. 2 and 3, the opposed reinforcing members 16 are operatively connected, in the embodiment of the invention illustrated, by a pair of straps 17 and 17' having their respective ends 18 and 18' anchored to the adjacent members 16. As illustrated in Fig. 5, the ends 19 of the straps may be bluntly pointed to facilitate installation.

The beams 16, as illustrated in Figs. 3, 4 and 6, have their inner faces 20 flared or tapered outwardly adjacent the ends of the beam as indicated at 21, with the corner edges of the face 20 and side faces 22 of the beam being suitably relieved by beveling as indicated at 23, rounding or the like. This construction eliminates any sharp right-angle corners on each beam adjacent the points of its engagement with the sheet 5 and thus eliminates the possibility of tearing which might otherwise exist if the beam were provided with sharp edges in engagement with the sheet. As a further precaution against possible tearing of the sheet adjacent the member 16, the sheet may be provided with a suitable reinforcing ply 24 along the inner face as illustrated in Figs. 1 and 2, or along the outer face adjacent the beam 16.

As clearly illustrated in Figs. 3, 6, 7 and 8, each beam is provided with a pair of openings or bores 25 therethrough of a diameter approximately equal to the width of the strap 17 or 17', whereby the strap ends may be freely inserted through the member. As particularly illustrated in Figs. 6 and 7, each bore 25 lies in a plane extending generally normal to the plane of the closure member 5, with the axis of each bore 25 in the beam being inclined in said plane outwardly from the inner face 20 toward the adjacent free end of the beam. Thus as viewed in Fig. 3, the outer ends of the bores 25 are spaced a greater distance apart than the inner ends opening on the face 20 of the beam.

Referring to Figs. 6 and 7, it will be apparent that when tension is applied to the strap 17 illustrated in Fig. 6, the strap which initially upon its insertion through the bore 25 will more or less extend along the axis of the bore, and tends to assume the position illustrated in Figs. 6 and 7, whereby the strap will partially compress or deform the portions of the beam adjacent the inner and outer mouths of each bore, whereby the strap extends at an angle with respect to the axis of the bore 25, the outermost half of that portion of the strap positioned in the bore lying below the axis and the opposite half being positioned above the axis. The deforming of the lower

portion 26 of the beam adjacent the outer mouth of the bore 25 and similar deformation of the beam adjacent the upper portion 28 of the inner mouth of the bore adjacent the face 20 results in an effective sealing of the outward flow of material through such bore. This action will be readily appreciated from an examination of Fig. 7, where it will be noted that the original semi-circular lower edge portion 27 of the outer mouth of the bore is more or less flattened by the force applied from the strap tensioning under load, while a similar action has resulted in a flattening of the upper portion 28 of the inner mouth of the bore. Such marginal portions of the beam at the respective bores 25 will result, if not in a complete flattening of the material, at least sufficient flattening to effectively close the bore to any appreciable passage of material therethrough.

Carried by each beam 16 are a plurality of anchor members or studs 29 which in the embodiment of the invention illustrated are arranged in longitudinal alignment on the beam. In the embodiment of the invention illustrated, the studs 29 are in the form of drive screws having a shank portion 31 provided with drive threads and is formed with a generally cylindrical shank portion 32 terminating at its outer end in an enlarged head 33. The studs 29 may also be provided with a flange or shoulder 34 adapted to seat on the outer face of the beam and forming a stop operative to limit penetration of the stud when it is driven into the beam, thereby insuring proper positioning of the stud for engagement with the strap ends 18 and 18'.

In the embodiment of the invention as illustrated in Fig. 5, three studs 29a, 29b and 29c are employed which are equally spaced longitudinally along the beam. The end portions 18' of the strap 17' are provided with a plurality of openings 35a, 35b and 35c longitudinally spaced the same distance apart as the respective studs 29 so that following the insertion of the end portion of the strap outwardly through the lower bore 25 of each beam 16, the end portion of the strap may be bent at right angles to the intermediate portion of the strap whereby such end portion will extend along the outer face of the beam with the openings 35a, 35b and 35c in alignment with their respective studs. The end portions 18 of the strap 17 are provided with a plurality of openings 36a, 36b and 36c, such openings all being of a keyhole shape having a relatively narrow slot portion 37a, 37b and 37c with the upper ends of each slot intersecting circularly shaped openings 38a, 38b and 38c. Both the openings 35 and 38 are of a size to permit the head 33 to freely pass therethrough, while the slotted portions 37 of the openings 36 are of a width slightly larger than the cylindrical shank portion 32 of each stud. Thus a stud may be inserted through any of the openings 36 and by relative movement of the band in a direction transverse to such stud, the portion 32 of the stud may enter the slot 37 of such opening, thereby preventing disengagement of the strap from the stud other than by again moving the strap longitudinally to position the larger opening 38 in alignment with the head of the stud and permitting the latter to pass therethrough.

Referring to Fig. 5, it will be noted that in the particular embodiment of the invention illustrated, the opening 36b is so arranged with respect to the openings 36a and 36c that while the distance between the centers of the latter two openings is substantially equal to the centers between their cooperable studs 29a and 29c, the portion 38b of the opening 36b is longitudinally offset, whereby the distance from the center of the latter to the center of the opening 38a is less than the corresponding distance between the studs 29a and 29b, thus making the distance from the center of the opening 38b to the center of the opening 38c greater than the corresponding distance between the studs 29b and 29c. However, the length of the slot 37b is greater than either of the slots 37a or 37c, whereby the distances between the

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bottom of the slot 37a and the slot 37b and from the latter to the bottom of the slot 37c are substantially equal to the corresponding distances between the centers of the respective studs. To anchor the straps 18 and 18', illustrated in Fig. 5, the end portion 18' is initially engaged with the studs 29, this being readily accomplished as the openings 35 are aligned with their respective studs, permitting all of the latter to be simultaneously inserted through the openings 35. Following this operation, the end portion 18 is longitudinally moved to position the opening 38b in alignment with the head of the stud 27b, in which position of the strap the openings 38a and 38c will not be aligned with their respective co-operable studs 29a and 29c, the latter being positioned above such openings as viewed in Fig. 5. The intermediate portion of the strap between the openings 38a and 38c may then be pressed or sprung inwardly, whereby the stud 29b enters the opening 38b with the heads of the studs 29a and 29c bearing against the adjacent face of the strap. After the head of the stud 29b has passed through the opening 38b, the end portion 18 of the strap may be moved longitudinally upward as viewed in Fig. 5, with the shank portion 32 of the stud 29b entering the slot 37b. Such longitudinal movement of the strip is continued until the openings 38a and 38c are brought into alignment with the heads of the studs 29a and 29c, thereby permitting the latter to extend through such openings and the strap to assume a more or less planar condition. Continued longitudinal movement of the strap will result in the shank portions 32 of the studs 29a and 29c entering their respective slots 37a and 37c until all three studs will seat in the bottom of their respective slots. In the event it is desired to disengage the strap from the beam, the procedure is reversed, with the end portion 18 of the strap 17 being moved longitudinally downward as viewed in Fig. 5 to bring the openings 38a and 38c in alignment with the heads of their corresponding studs whereby the adjacent portions of the strap may be sprung outwardly and withdrawn from such studs, following which the strap is moved longitudinally downward to bring the opening 38b in alignment with the head 33 of its co-operable stud and permit the disengagement of the latter therefrom.

It will be apparent that with this construction the end portion 18' of the strap 17' is locked in position on the studs by the end portion 18 of the strap 17, and as the three larger openings 38 in the portion 18 cannot be simultaneously aligned with their co-operable studs, substantially all possibility of accidental or undesired disengagement of the strap 17 from the beam is eliminated as portions of the strap must also be sprung out of the original strap plane to effect disengagement. In the embodiment of the invention illustrated in Fig. 4, three studs and three co-operable openings in the respective end portions of the straps are disclosed, this construction providing a degree of adjustment of the effective length of the respective straps. Railway freight cars in use at the present time range in width from approximately eight feet six inches to nine feet six inches and with the construction illustrated the studs 29 are equally spaced, permitting any adjacent pair of studs to be employed as well as all three so that the strap could be attached as heretofore described, or if desired to increase the effective length of the strip, the studs 29a and 29b could be respectively engaged with the openings 36b and 36c, thereby increasing the effective length of the strap a distance equivalent to the spacing between adjacent studs.

Where like structures are employed in each doorway of the car as illustrated in Fig. 2, the total increase in length would be double the distance between adjoining studs. Additional adjustment may be obtained by engaging the studs 29b and 29c respectively with the openings 37a and 36b, the strap in such case either overlying the stud 29a or an additional opening 36d may be provided which is of the same proportions as the openings

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36a and 36c, the center of such opening being spaced the same distance from the center of the opening 36a as the distance between centers of the studs 29, whereby the opening 36d may be engaged with the stud 29a when the openings 36a and 36b are respectively engaged with the studs 29b and 29c. While I have illustrated merely circular openings 35 in the end portion 18' of the strap 17', if desired the portion 18' could be provided with the same shaped openings and arrangement as illustrated in the end portion 18, in which case both straps would be anchored to the beam independently of each other.

The installation of the structure illustrated as follows: Normally the person installing the doors in a railway car will initially put up one door, setting the beam 16 in place with the end portions of the straps anchored thereto and extending into the car, the straps being engaged by the installer from within the car as the door is put up. The opposite door may then be applied to the car side wall with the straps being inserted through the door and engaged with the co-operable beam 16 either during the installation of the door, or inserted through the door structure after mounting of the latter and passed through the beam and engaged with the studs from the exterior of the car. After the doors have been mounted, grain or other material may be loaded into the car, such loading action as it progresses applying pressure to the door structures and placing the straps 17 and 17' under tension. It will be noted that until the car is loaded the straps are under relatively little tension and it is at this point that the straps may become disengaged were not the novel arrangement of the anchoring means utilized. As the car is loaded and tension increases on the straps, the portions of the straps positioned in the respective bores 25 tend to assume a horizontal position, whereby the straps produce a deforming or depressing action on the portions of each beam adjacent the mouth of the respective bores 25 as previously described. Normally hard wood such as oak is preferably used for the beams 16, and the compressing of the wood tends to provide a greater density of material in the beam adjacent the mouths of the bores 25 which may to a certain extent be likened to the hardening of a metal member adjacent points subject to the greatest stress. Consequently, after the initial compression has taken place relatively little additional compression occurs even over extended periods of use of the door.

The construction and arrangement of the bores 25 and the straps also has an additional advantage in that a snubbing action on the strap is produced. Obviously, the straps may be under considerable tension when the car is fully loaded and as the anchor studs 29 are merely driven into the beam 16, upon the transmission of excessive shock or other forces to the studs from the strap, it might be possible to pull out the studs with resultant failure in the door structure. However, due to the engagement of the strap with the beam at opposite ends of each bore 25, and the angular relation of the intermediate portion of the strap within the bore, a considerable snubbing action is derived in addition to that resulting from the bend in the strap at the exterior face of the beam, so that the effective stresses imparted to the studs by the strap are in effect reduced, particularly with respect to shock stresses while the car is in motion or resulting from impact of the car with another car, as for example, in freight yards, etc. While the angle of the bores 25 with respect to the strap and outer face of the beam may be varied, I have found that excellent results are obtained with an angle of 58°. Likewise, the forces applied by the straps to the beams, as a result of the angular relation of the bores 25 tend to counteract outward bowing of the beam as the straps in effect apply a torque or bowing action to the end portions of the beam in an outward direction.

In certain applications of grain doors and the like, it is common practice to load the railway car to a point higher than the door illustrated in Fig. 1 of the drawing.

For example, in loading malted barley and other similar products, the height of the grain in the car may be such that a door structure $7\frac{1}{2}$ to 8 feet or more may be required across each car doorway. In such applications, a considerably longer reinforcing beam 16 may be required and to provide adequate reinforcing of the door structures by the beam, it may be desirable to utilize a third strap. For example, the beam 16' illustrated in Fig. 8 is provided with a pair of bores 25 generally corresponding to the bores 25 of the beam 16, and is provided with a third bore 25' adjacent the opposite end portion of the beam. In the construction illustrated, the bores 25 diverge outwardly in the same manner as the construction illustrated in Fig. 3 whereby straps passing through such bores may be secured to desired studs 29 mounted on the beam between the two bores 25 in the same manner as the construction illustrated in Figs. 3 and 5. The strap to be inserted through the bore 25' may be similar, for example, to the strap 18 and engageable with studs 29' adjacent the bore 25', the arrangement of the studs 29 and 29' on the beam 16' being such that each of the straps associated with the beam may be adjusted to accommodate cars of varying widths. Apart from an increased length, the beam 16' is constructed similarly to the beam 16, having tapered end portions 21 and beveled or rounded edges 23. While the construction above described can be employed in relatively short beams, where extremely heavy loads are anticipated, normally two straps such as illustrated in Figs. 2 and 3 of the drawings are adequate for most applications.

It will be apparent from the above disclosure that I have provided a novel harness structure which may utilize a relatively inexpensive wooden reinforcing beam and which is so designed that the strap members are effectively anchored to the reinforcing beam with substantially all possibility of accidental displacement eliminated. Likewise, I have provided a novel structure by means of which an adjustment in the effective length of the straps may be readily obtained to accommodate cars of different widths, and in which additional means for sealing the openings where the strapping passes through the door structure and the beam is not required. It will also be noted that while a wooden beam may be employed, due to the novel construction utilized, the beam may be reused. It might be mentioned that while I have illustrated the anchoring means for the strap ends as including uniformly spaced studs adapted to engage cooperable openings in the strap ends, at least one of such openings being spaced differently than the studs, in certain cases it may be desirable to reverse the construction, utilizing uniformly spaced openings in the strap in combination with a plurality of studs, at least one of which is spaced differently than the corresponding openings in the strapping.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a grain door, for railway cars, and the like, the combination of a pair of door structures, each adapted to extend across one of a pair of opposed doorways and be marginally secured to the car structure, a pair of elongated reinforcing members of wood each adapted to be positioned at the central portion of one of the door structures at the exterior face thereof, and a harness structure operatively connecting said members, said harness structure comprising a pair of straps, each passing through the respective door structures and said members, the latter each having a pair of longitudinally spaced bores therein, corresponding bores on the respective members being op-

positely disposed, each of said straps having its end portions extending through corresponding bores, each of said bores being inclined with respect to the adjacent door face whereby the portion of the tie positioned in said bore initially extends at an acute angle with respect to the door face, the bores in each member diverging from the inner face of the member longitudinally outward toward the ends of such member and means on each member positioned intermediate the bores therein for securing corresponding ends of the respective straps to the adjacent reinforcing member.

2. In a grain door, for railway cars, and the like, the combination of a pair of door structures, each adapted to extend across one of a pair of opposed doorways and be marginally secured to the car structure, a pair of reinforcing members of wood each adapted to be positioned at the central portion of one of the door structures at the exterior face thereof, and a harness structure operatively connecting said members, said harness structure including a tie strap passing through the respective door structures and said members, the latter each having a bore therein through which the strap extends, said bore being inclined with respect to the door face whereby the portion of the strap positioned in said bore initially extends at an acute angle with respect to the door face and means for securing each end of the strap to the adjacent reinforcing member.

3. A vertically extending reinforcing member for grain doors and the like and for assembling tie members thereof comprising an elongated wood body of substantially rectangular cross section, having a pair of bores extending transversely therethrough, each bore adapted for receiving a tie member provided with at least one opening at each end, said bores extending substantially parallel to the side faces of said body and at an acute angle with respect to the longitudinal axis thereof, the axes of said bores diverging from the inner face of the body so that tie members in the assembled position within the bores substantially seal the bores, and means complementally formed to said openings provided in the tie members and carried by said body at the outer face thereof for anchoring the tie members extended through said bores.

4. A vertically extending reinforcing member for grain doors and the like and including tie members, said vertically extending reinforcing member for assembling the tie member comprising an elongated wood body of substantially rectangular cross section, having a pair of bores complementally formed to the tie member and extending transversely therethrough to receive the tie members, said bores extending at an acute angle with respect to the longitudinal axis thereof so that said tie members within said bores substantially seal said bores.

5. A vertically extending reinforcing member for grain doors and the like as set forth in claim 4, wherein said bores extending approximately at an angle of 58° with respect to the longitudinal axis thereof.

6. A vertically extending reinforcing member for grain doors and the like and for assembling tie members thereof comprising an elongated wood body of substantially rectangular cross section, having a pair of bores extending transversely therethrough, each bore adapted for receiving a tie member provided with at least one opening at each end, the axis of said bores lying in a longitudinally extending plane and each extending at an acute angle with respect to the longitudinal axis thereof with the axes of said bores diverging from the inner face of the body so that the tie members in the assembled position within the bores substantially seal the bores, the end portions of the latter being tapered at the inner face thereof, and means complementally formed to said springs in the tie members and carried by said body at the outer face thereof for anchoring the tie members extended through said bores.

7. A vertically extending reinforcing member for flexible grain door structures and the like according to claim 4, said wood body being formed from a relatively hard wood, the inner face of said reinforcing member adapted to bear against a flexible grain door structure flaring outwardly

at the end portions of the reinforcing member, the corners formed by said inner face and the side faces of said reinforcing member being relieved to eliminate sharp corners therealong.

8. In a grain door, for railway cars, and the like, the combination of a pair of door structures, each adapted to extend across one of a pair of opposed doorways and be marginally secured to the car structure, a pair of elongated reinforcing members of wood each adapted to be positioned at the central portion of one of the door structures at the exterior face thereof, and a harness structure operatively connecting said members, said harness structure comprising a plurality of straps, each passing through the respective door structures and said members, the latter each having a plurality of longitudinally spaced bores therein, corresponding bores on the respective members being oppositely disposed, each of said straps having its end portions extending through corresponding bores, each of said bores being inclined with respect to the adjacent door face whereby the portion of the tie positioned in said bore initially extends at an acute angle with respect to the door face, and means on each member positioned intermediate the bores therein for securing corresponding ends of the respective straps to the adjacent reinforcing member.

9. A vertically extending reinforcing member for grain doors and the like and for assembling tie members thereof comprising an elongated wood body of substantially rectangular cross section, having a plurality of bores extending transversely therethrough, each bore adapted for receiving a tie member provided with at least an opening at each end, said bores extending substantially parallel to the side faces of said body and at an acute angle with respect to the longitudinal axis thereof, the axes of two of said bores diverging from the inner face of the body and the axis of another of said bores extending parallel to the axis of one of said pair of bores so that tie members in the assembled position within the bores substan-

tially seal the bores, and means complementally formed to said openings provided in the tie members and carried by said body at the outer face thereof for anchoring the tie members extended through said bores.

10. A vertically extending reinforcing member for grain doors and the like as set forth in claim 9, wherein said bores of said reinforcing member are three in number and extend transversely therethrough, each of said bores extending approximately at an angle of 58° with respect to the longitudinal axis thereof.

11. A vertically extending reinforcing member for grain doors and the like and for assembling tie members thereof comprising an elongated wood body of substantially rectangular cross section, having three bores extending transversely therethrough, each bore adapted for receiving a tie member provided with at least one opening at each end, the axis of said bores lying in a longitudinally extending plane and each extending at an acute angle with respect to the longitudinal axis thereof with the axes of two adjacent bores diverging from the inner face of the body and the other bore having its axis extending parallel to the axis of the adjacent bore so that the tie members in the assembled position within the bores substantially seal the bores, the end portions of the body being tapered at the inner face thereof, and means complementally formed to said openings in the tie members and carried by said body at the outer face thereof for anchoring the tie members extended through said bores.

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