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FREIGHT-BRACING APPARATUS

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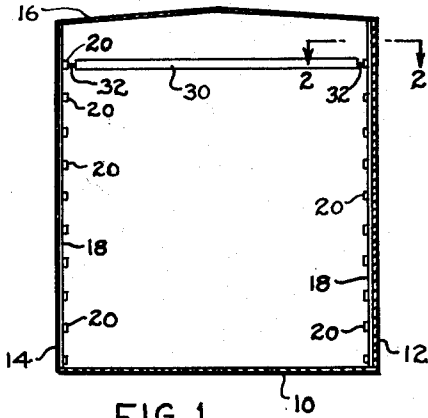


FIG. 1

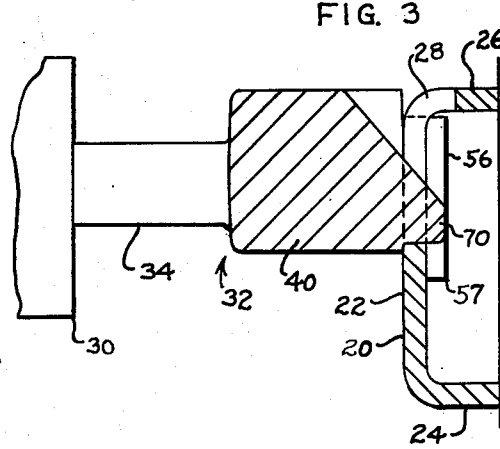


FIG. 3

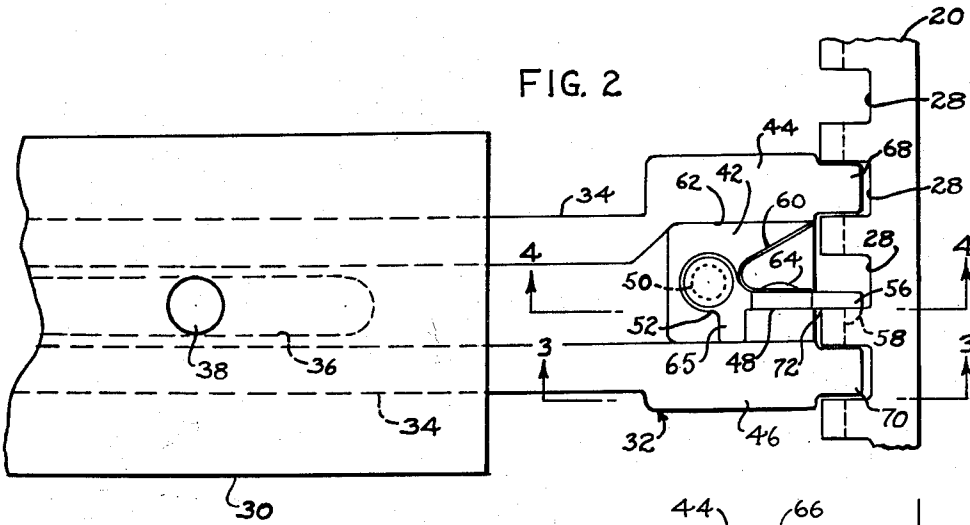


FIG. 2

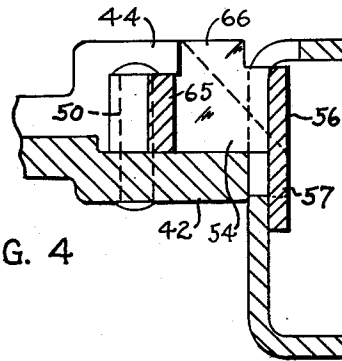


FIG. 4

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FREIGHT-BRACING APPARATUS

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This invention relates to freight-bracing apparatus, as for example apparatus used in railroad cars and highway vans to brace cargo and prevent shifting of same during transit.

A general object of the invention is to provide a freight-bracing apparatus wherein a series of horizontal support rails are positioned along the opposite side walls of a freight vehicle to removably and adjustably support certain freight-bracing cross bars, the arrangement including a novel latching structure for permitting the cross bars to be installed at various positions of vertical and horizontal adjustment.

Another object of the invention is to provide a support rail-cross member head arrangement which can be manufactured at relatively low cost and which has desired characteristics of high strength, jam-free operation, ability to withstand rugged railroad use, and long service life.

Other objects of this invention will appear from the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

FIGURE 1 is a sectional view of a railroad car having one embodiment of the invention incorporated therein;

FIG. 2 is an enlarged top plan view taken along line 2—2 in FIG. 1;

FIG. 3 is a sectional view taken along line 3—3 in FIG. 2; and

FIG. 4 is a sectional view taken along line 4—4 in FIG. 2.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring in greater detail to the drawings, there is shown therein a railroad type freight vehicle having a bottom wall 10, side walls 12 and 14, and a top wall 16. Each of the side walls is provided at horizontally spaced points with a series of vertical pillars 18 which serve to reinforce the vehicle and support the horizontal rails designated by numerals 20. Referring to FIG. 3, each rail 20 includes a front wall 22, a lower flange or wall 24 and an upper flange or wall 26. As best shown in FIG. 2, the rail is provided with a row of regularly spaced slots 28, each slot occupying the front portion of top wall 26 and the upper portion of front wall 22.

Referring again to FIG. 1, there is shown a horizontal beam-like cross member 30 having heads 32 at its opposite ends for locking engagement in desired ones of the aforementioned slots 28 in rails 20. By this arrangement a desired cross member 30 may be located in an optimum position for bracing the freight, either by direct engagement therewith or by engagement with bulkheads and deckboards (not shown). It will be understood that cross members 30 may be utilized in dif-

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ferent vertical locations by mounting same between the appropriate ones of rails 20. One or both of the locking heads 32 may be slidably attached to the cross member 30 to permit the heads to be retracted from the rails 20 during freight removal operations.

As seen in FIG. 2, head 32 is of one-piece construction and includes a slide portion 34 freely telescoped within a longitudinal bore of cross member 30, said slide portion having a longitudinal slot 36 which accommodates a fixed vertical pin 38 to retain the head and cross member together. The head further includes a body portion 40 having a bottom wall 42 and two upstanding side walls 44 and 46, said three walls defining a cavity in which is positioned a latch member designated generally by numeral 48. Bottom wall 42 is provided with a vertical circular opening in which is mounted a headed pivot pin 50, said pin extending upwardly from the bottom wall through the hub portion 52 of latch member 48, the arrangement being such as to mount the latch member for horizontal arcuate movement around the pin 50 axis. The latch member includes an arm portion 54 which terminates in a hook-like extension 56, said extension having downwardly-extending portion 57 and a rounded leading edge 58 which forms a cam surface for a purpose to be described.

Under the invention member 48 serves to lock head 32 onto rail 20; and to prevent undesired movement of member 48 in the unlatching direction there is provided a U-shaped leaf-type compression spring 60 suitably engaging the inner face 62 of wall 42 and the opposed face of arm portion 54, a rivet 64 being preferably provided to prevent accidental displacement of the spring. It will be understood that spring 60 biases member 48 clockwise around the axis of pin 50 to its FIG. 2 position; a lug-like extension 65 formed integrally on member 48 limits the clockwise motion and thereby retains the latch in an operative position. To move the latch counterclockwise member 48 is provided with a handle-forming thumb portion 66, economically formed as a planar extension of wall 54. The upstanding side walls 44 and 46 serve to substantially enclose the latch member and prevent it from being accidentally unlatched or damaged by the freight; nevertheless, the latch is easily accessible for manual actuation when necessary.

Referring to FIG. 3, the leading edges of walls 44 and 46 define projections 68 and 70, which may be inserted in any one of the slots 28 as desired. During installation of the cross member on rail 20 head 32 is advanced horizontally and then lowered to place projections 68 and 70 in the desired slots 28 and latch portion 56 in the intervening slot. During this movement cam surface 58 strikes the rail edge designated by numeral 72, whereupon the latch is forced counterclockwise around the axis of pin 50. When hook portion 56 has passed beyond front wall 22 spring 60 becomes effective to snap the latch clockwise to its FIG. 2 position. In this position the hook portion 56 lies beneath a portion of rail upper wall 26 and behind a portion of front wall 22, to thus prevent pull-out movement of the head upwardly and horizontally. Projections 68 and 70 prevent movement of the head longitudinally of the rail and downwardly. The head and cross member 30 are thereby retained in a firmly locked position on the rail. To disengage the head from the rail it is necessary to manually employ counterclockwise pressure on the right face of handle 66 sufficient to move hook portion 56 into the plane of its cooperating slot 28, and to then withdraw the head 32 upwardly and horizontally away from the rail. Lower portion 57 of the hook portion serves as insurance against pull-out of the cross member when in the locked position.

To remove the cross member 30 from load bracing engagement with the rails 20, the thumb portion 66 of the latch 48 is engaged and manually actuated to rotate the latch 48 counterclockwise to move that part of the portion 56 from beneath the top wall 26 and into a position having vertical clearance in its selected slot 28. The cross member 30 may now be bodily lifted in a vertical direction to remove the head 32 from the rail 20 for the reason that the projections 68 and 70, likewise, have vertical clearance on their respective slots 28. In other words, to remove the heads 32 from the rails 20, with the latches 48 manually retracted, only relative vertical movement is required. This is an advantage when only one head 32 is axially slidable in the body of the cross member 30, a practice which is generally standard in this art. When the freight is being unloaded, pressure on the cross member 30 due to shifting of the load in transit may make it very difficult to change the over-all length of the cross member 30 and heads 32 in order to remove the heads 32 from the rails 20. By having the slots 28 extending into the wall 26 a greater distance than the horizontal extension of the projections 68 and 70 and the latch 48 into the rails 20, the heads 32 (with the latches 48 manually retracted) may be removed as well as inserted from and into the slots 28 solely by relative vertical movement.

It will be noted that the illustrated construction is relatively simple and low cost, since head 32 may be formed as a one-piece forging, and the pin 50 and latch member 48 are relatively straightforward low-cost devices. The entire device will withstand rugged use, since the latch parts are to a large extent shielded by walls 44 and 46. It is contemplated that some changes could be resorted to without departing from the spirit of the invention as set forth in the appended claims.

We claim:

1. In combination, a horizontal rail having a vertically extending front wall and a rearwardly extending upper wall, a row of regularly spaced slots formed along the length of said rail, each slot occupying a front portion of the upper wall and an upper portion of the front wall, a freight-bracing cross member having a head locatable adjacent the rail, said head having two rigid horizontally spaced projections insertable into and removable from selected said slots solely by relative vertical movement to prevent movement of the cross member downwardly and longitudinally of the rail, and a spring-biased latch mounted on the head for pivotal movement in a horizontal plane, said latch being adapted in a retracted position to extend into one of the rail slots solely by relative vertical movement, a hook portion defined on said latch extending into said one rail slot a distance less than the distance said slot occupies in said rail upper wall and projecting behind a portion of the rail front wall to prevent horizontal pull-out of the head from the rail, and an upwardly facing abutment defined on said hook portion projecting beneath a portion of the rail upper wall to normally prevent upward pullout of the head from the rail when said latch is released from its retracted position.

2. In combination, a horizontal rail having a vertically extending front wall and a rearwardly extending upper

wall, a row of regularly spaced slots formed along the length of said rail, each slot occupying a front portion of the upper wall and an upper portion of the front wall, a freight-bracing cross member having a head locatable adjacent the rail, said head having two rigid horizontally spaced projections insertable into and removable from selected said slots solely by relative vertical movement to prevent movement of the cross member downwardly and longitudinally of the rail, and a spring-biased latch mounted on the head for pivotal movement in a horizontal plane, said latch having an arm portion extending away from the cross member so as to be insertable in one of the slots simultaneously with the entrance of said projections in said selected slots, a hook portion extending from said arm portion of such length that said arm and hook portions extend into the associated slot a distance less than the distance said slot occupies in said rail upper wall, said hook portion extending below said arm portion to normally lie behind the rail front wall to prevent horizontal pull-out of the head, an upwardly facing abutment defined on said hook portion adapted to normally project beneath a portion of the rail upper wall to prevent upward pull-out of the head from the rail, and a thumb-actuable element extending upwardly from the arm portion to move the latch about its pivot.

3. In combination, a horizontal rail having an upper wall and a front wall, a row of slots extending along said rail, each slot occupying a front portion of the upper wall and an upper portion of the front wall, a freight-bracing cross member normally positionable in a horizontal location extending right angularly to the rail, and having a rail-engaging head connected therewith, said head having a bottom wall and two upstanding side walls defining a central upwardly open cavity, horizontal projections extending from respective ones of said side walls to enter into selected said slots in the rail solely by relative vertical movement to prevent movement of the head downwardly or longitudinally of the rail, a vertical pivot carried on the bottom wall in the aforementioned cavity, a latch member having a hub connected with said pivot to mount the latch member for arcuate movement in a horizontal plane, said latch member also having a wall portion extending from the hub in the direction of the rail to normally enter a third one of said rail slots, said wall portion extending into said third one of said rail slots a distance less than the distance said slot occupies in said rail upper wall, a hook portion defined on the free end of said wall portion adapted to take a position behind a portion of the front wall to prevent the head from moving horizontally away from the rail, and an upwardly facing abutment defined upon said hook portion adapted to take a position beneath portion of the rail upper wall to prevent the head from moving upwardly away from the rail.

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