United States Patent

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[72] Inventor **Robert E. Holman, Jr.**
10619 Doric St., Dallas, Tex. 75220

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[54] **CAPTIVE BRACE ROD AND TRACK**
6 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **105/369,** 248/354, 248/357
[51] **Int. Cl.** **B61d 45/00**
[50] **Field of Search** ..... 105/369(B), 376; 248/354, 357

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Primary Examiner—Drayton E. Hoffman
Attorney—Clarence A. O'Brien & Harvey B. Jacobson

ABSTRACT: A spring-loaded telescopic brace rod extending between the ceiling and floor of a load carrying body such as a trailer which is captively supported from a track system in the ceiling to enable movement of the brace rod along the track system when it is in a retracted position with the track system and brace rod including interengaging lock means for locking the brace rod to the track system in the ceiling and a perforated rail in the floor when the brace rod is in extended position.

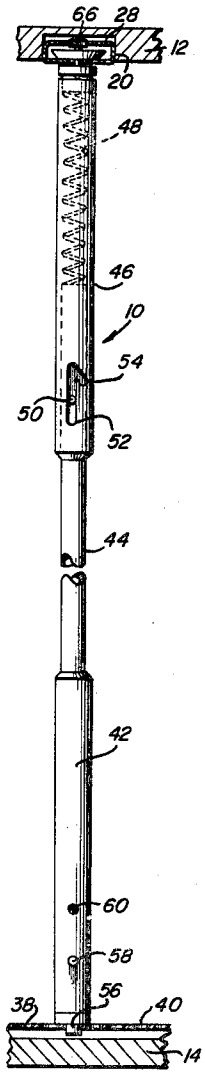


Fig. 2

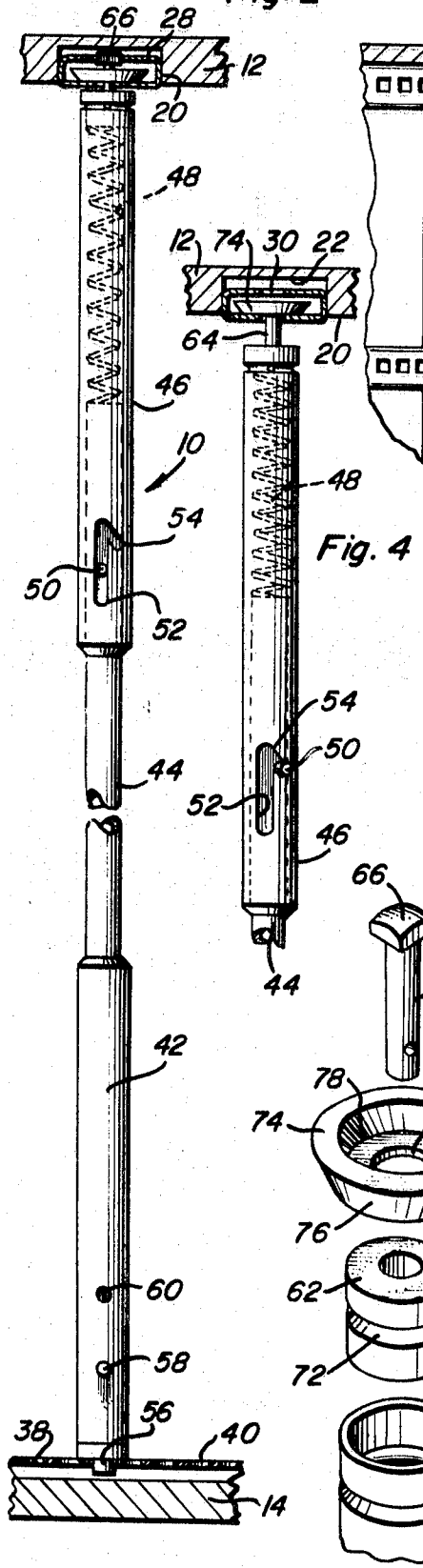


Fig. 1

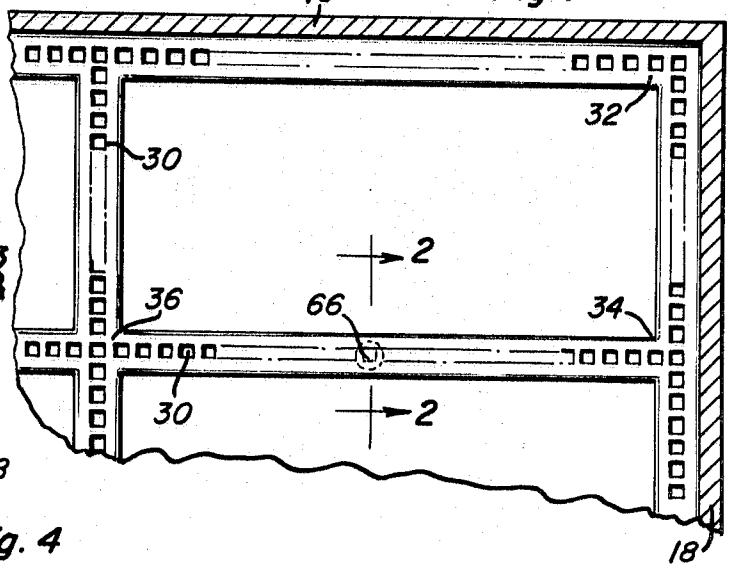


Fig. 4

Fig. 3

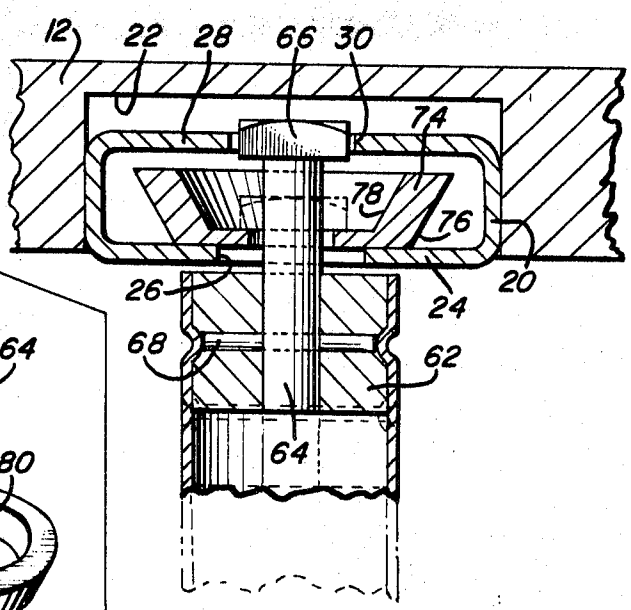
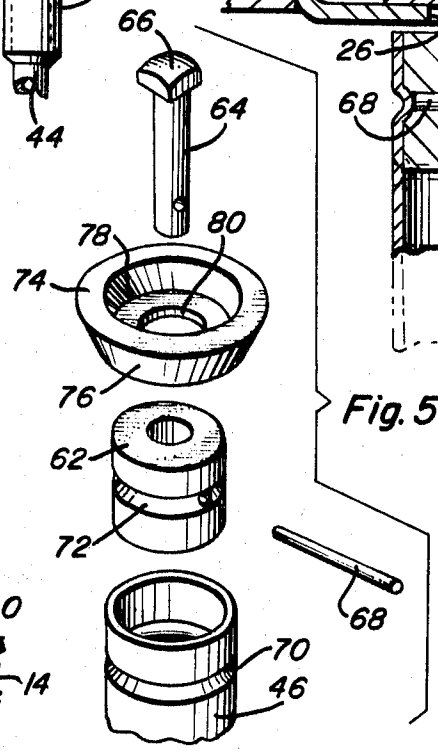


Fig. 5



Robert E. Holman Jr.
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

CAPTIVE BRACE ROD AND TRACK

The present invention generally relates to brace rods employed in load-carrying bodies for retaining the load in such a body in a braced or confined condition.

Brace rods extending from floor to ceiling of a load-carrying body are generally well known. When such brace rods are removed such as when unloading the load carrying body, they frequently become lost or misplaced and otherwise introduce a problem of disposition when unloading the load space. Frequently, conventional brace rods are removed and laid down along the corner of the floor or otherwise placed in a position that may result in damage to the brace rod, injury to persons removing the load. At other times, conventional brace rods are propped in the corner of a load-carrying space where they frequently fall and otherwise present problems.

Accordingly, it is an object of the present invention to provide a brace rod which is captively supported from a track layout in the ceiling of the load-carrying body so that the brace rods are never disconnected from the load-carrying body even though they may be telescoped from an extended to a retracted condition. This enables the brace rod to be moved along the track system to a desired stored position thus overcoming the existent problems when employing conventional brace rods.

Another object of the present invention is to provide a captive brace rod and track employing interengaging structures which lock the brace rod in position when in extended position and enable free movement of the brace rod along the track when the brace rod is retracted with the lower end of the brace rod including a projection lockingly engaging a perforated rail in the floor of a load body.

Still another object of the present invention is to provide a telescopic captive brace rod in accordance with the preceding objects including a manually manipulatable structure which releasably retains the brace rod in retracted position for movement thereof along the track with spring means being provided for extending the brace rod to extend it in locked position when the retaining means is released.

Still a further important object of the present invention is to provide a captive brace rod and track which is relatively simple in construction, easy to install, dependable and long lasting and simple to manipulate.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a top plan view of a load-carrying body illustrating the track arrangement and a captive brace associated therewith;

FIG. 2 is a vertical sectional view, with portions shown in elevation, taken along section line 2–2 of FIG. 1 illustrating the relationship of the brace rod, track in the ceiling of the trailer and the perforated rail in the floor;

FIG. 3 is an enlarged detailed sectional view illustrating the upper end of the brace rod and the track illustrating the lock structure for locking the brace rod in relation to the track;

FIG. 4 is a view similar to the upper portion of FIG. 2 but illustrating the brace rod in unlocked and retracted position to enable free movement thereof along the track; and

FIG. 5 is an exploded perspective view illustrating the components of the upper end of the brace rod.

Referring now specifically to the drawings, the numeral 10 generally designates the brace rod of the present invention which is disposed between the ceiling 12 and the floor 14 of a load-carrying body such as a truck body, trailer body or the like. The load-carrying body is provided with the usual sidewalls 16 and end walls 18 with one of the end walls being openable in a well known and conventional manner.

Disposed in the ceiling 12 is a downwardly opening channel-shaped track 20 received in a recess 22 in the ceiling 12 although the track could also be supported along the inner surface of the ceiling if desired. The lower edges of the channel-shaped track 20 are inturned as at 24 to define a continuous longitudinal slot 26 which opens downwardly toward the load space. The upper wall or web 28 of the track 20 is provided with a plurality of longitudinally spaced apertures 30 therein which extend throughout the length of the track. As illustrated, the track 20 is oriented so that corner portions 32 are provided, T-portions 34 are provided and crossed portions 36 are provided with the track 20 defining a grid throughout the area of the ceiling 12.

The floor 14 is provided with rails or plates 38 thereon with spaced apertures 40 therein which correspond with the spacing of the apertures 30 with the rails or plates 38 being arranged in parallel and aligned relation to the tracks 20 so that the brace rods 10 extend between the rails 20 and the floor plates or rails 38 which may be recessed in the floor in the same manner as the tracks 20 are recessed in the ceiling 12.

The brace rod 10 includes three tubular telescopic members including a lower tubular member 42, a central or intermediate tubular member 44 and an upper tubular member 46. The central tubular member 44 is telescopic into both the lower tubular member 42 and the upper tubular member 46 with a compression coil spring 48 being disposed between the upper end of the central tubular member 44 and the closed upper end of the upper tubular member 46 thus spring biasing the central tubular member 44 axially outwardly and downwardly from the upper tubular member 46. A projecting pin 50 is rigidly fixed to the portion of the central tubular member 44 telescoped into the upper tubular member 46 with the pin 50 disposed in a longitudinal slot 52 formed in the upper tubular member 46 thus guiding and limiting the relative longitudinal movement of the tubular members 44 and 46 with the spring biasing the tubular member 44 so that the pin 50 is urged towards the bottom of the slot 52, thus extending the brace rod toward its extended position.

The upper end of the slot 52 includes a laterally and downwardly extending extension 54 forming an acutely angulated notch to receive the pin 50 when the central tubular member 44 has been grasped and moved upwardly thus partially compressing spring 48 until the pin 50 moves substantially to the upper end of the slot 52 after which the lower tubular member 44 is rotated slightly into registry and engagement with the notch or lateral extension 54 of the slot 52 thus locking the brace rod in retracted position.

The lower end of the lower tubular member 42 is provided with a closure plug having a cylindrical projection 56 extending axially therefrom for reception in one of the apertures 40 in the perforated rail 38. Also, the overall length of the brace rod may be adjusted by releasing a spring-loaded lockpin 58 carried by the lower end of the central tubular member 44 so that it may engage with one of a plurality of vertically spaced holes 60 formed in the lower tubular member 42 with the number of holes and location thereof being variable to enable the length of the brace rod to be adjusted so that the spring 48 will cause the brace rod to lock between the track 20 and rail 38 before the pin 50 engages the lower end of the slot 52 thus assuring secure locking of the brace rod and also eliminating rattles which would occur due to looseness if the bias of the spring 48 was released which would occur if the pin 50 engages the lower end of the slot 52.

The upper end of the upper tubular member 46 is provided with a closure plug 62 having a stem 64 received therein and extending axially therefrom with the upper end of the stem having a square head 66 which is shaped to fit into the apertures 60. The stem 64 is secured to the plug 62 by a pin 68 extending diametrically thereof with the assembled stem, plug and pin being inserted into the end of the tube 46 and secured in place by a peripheral groove 70 being formed in the tubular member 46 for deforming the tubular member 46 into a peripheral groove formed in the plug 62 as designated by numeral 72 thus permanently locking the plug, pin and stem in position.

Loosely mounted on the stem 64 between the head 66 and the upper end of the tubular member 46 and the plug 62 is an

annular retaining member 74 generally in the form of a cup-shaped member having an upwardly inclined outer peripheral surface 76 and an upwardly inclined inner peripheral surface 78 which defines an internal cavity. The center of the annular member 74 is provided with an aperture 80 which is positioned over the stem 64 and is substantially larger in diameter than the stem 64 for relative free movement therebetween so that the stem 64 may move vertically in relation to the annular retaining member 74 and also may be angulated in relation thereto. The inclined surface of the retaining member or disc 74 enables the disc 74 to be easily slid longitudinally along the track 20 by supporting engagement with the upper surface of the inturned edges 24 on both sides of the slot 26 as illustrated in FIG. 3. This movement is permitted when the brace rod is in retracted position and the pin 50 disposed in the notch 54 so that the weight of the brace rod 10 will be suspended by the headed end 66 of the stem 64 from the retaining disc 74 thus disengaging the headed end 66 from the aperture 30 as illustrated in dotted line in FIG. 3 and also in FIG. 4. When the brace rod 10 has been manipulated into the desired position, the central tubular member 44 is grasped and moved upwardly and twisted slightly in a counterclockwise manner while the projection 56 is aligned with an aperture 40 so that as the projection 56 engages the aperture 40 and the lower end of the tubular member 42 engages the rail 38, the spring will move the upper tubular member 46 upwardly thus moving the stem 64 upwardly and the headed end 66 thereof upwardly into one of the apertures 30. The upper edge of the headed end 66 is beveled to facilitate movement of the headed end 66 into the aperture 30. Inasmuch as the apertures 30 and the headed end 66 are both square or polygonal, this prevents rotation of the brace rod thus facilitating operation of the pin 50 in relation to the slot 52 and the notch 54 when retracting the brace rod.

Once the brace rods that normally will be required in a load body have been installed in the track system, the ends of the track may be closed by any suitable means thus permanently securing the brace rods in position so that they will always be available for use. This structure enables the brace rods to be adjusted to the desired optimum position for use in bracing a load in the usual and known manner and also enables them to be oriented easily and quickly in a stored position.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

I claim:

1. A load brace rod comprising axially telescopic members, spring means interconnecting said members for biasing them into extended position, means limiting the extension of the telescopic members and releasably retaining them in retracted position, and support means at one end of said load brace rod, said support means including an axial stem rigid with the brace rod, and a retaining disc captively retained on said stem but capable of longitudinal movement thereon, said stem being headed for retaining the disc thereon, the opposite end of said brace rod including an axial projection for locking engagement with an opposed apertured surface, said load brace rod being suspended, when in retracted position, an overhead track system employed in a load body of a load-carrying vehicle and including a channel-shaped track having downwardly extending and inturned flanges forming an overhead slotted track, said retaining disc being slidably disposed in said track with the stem received in the slot therein, said track including a plurality of apertures therein receiving the headed end of the stem for locking the brace rod in position on the track when the brace rod is extended with the opposite end engaging an opposing surface thereby spring biasing the headed end of the stem into engagement with an aperture in the track for locking the brace rod in position.

2. The structure as defined in claim 1 wherein said headed end of the stem and apertures in the track are polygonal in configuration to prevent relative rotation therebetween, said means retaining the telescopic brace rod in retracted position being actuated and released by relative rotation between the telescopic members thereby facilitating operation of said means.

3. A load bracing assembly for a load body of a load carrying vehicle in which the load body has opposing walls, said assembly comprising an elongated track adapted to be mounted on one of the opposing walls, said track including spaced and aligned longitudinal flanges disposed in opposed relation to define an elongated slot and a plurality of longitudinally spaced socket means disposed in alignment with the slot and disposed inwardly thereof, and a brace rod including a longitudinally adjustable member extendable and retractable between the opposing walls, means on one end of said brace rod longitudinally movably attaching the brace rod to the track, and means on the same end of the brace rod to engage with the socket means in the track to lock the brace rod in longitudinally adjusted position, said means engaging the socket means in response to longitudinal extension of the brace rod and disengaging the socket means in response to longitudinal retraction of the brace rod.

4. The structure as defined in claim 3 wherein said means on one end of said brace rod includes an axial stem rigid therewith, said stem being movably received in said slot, a retaining disc mounted on said stem for longitudinal movement and being slidably disposed in said track against the inner surface of said flanges, said means engaging the socket means including a headed inner end on the stem retaining the disc thereon and engaging the socket means in the track when the rod is extended with the other end engaging an opposing wall thereby urging the headed end into the socket means and locking the brace rod in longitudinally adjusted position on the track.

5. The structure as defined in claim 4 wherein said headed end of the stem and the socket means are polygonal in configuration to prevent rotation of said brace rod, said brace rod including means releasably retaining the telescopic members in retracted position, said telescopic members being relatively rotatable, said releasable means being operative in response to relative rotation between the telescopic members whereby the stem and socket means facilitate operation of said releasable means.

6. The structure as defined in claim 5 wherein said telescopic members are spring biased toward an extended position, the wall of the load body opposed to the track having a plurality of socket means receiving the end of the brace rod remote from the stem when the brace rod is extended thereby positively locking both ends of the brace rod in adjusted position.