United States Patent

[11] **3,570,413**

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[54] **SOCKET FITTING FOR BRACING POSTS**
4 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **105/369**
[51] **Int. Cl.** **B61d 45/00**
[50] **Field of Search** ..... 105/376; 248/351, 357; 105/369 (B)

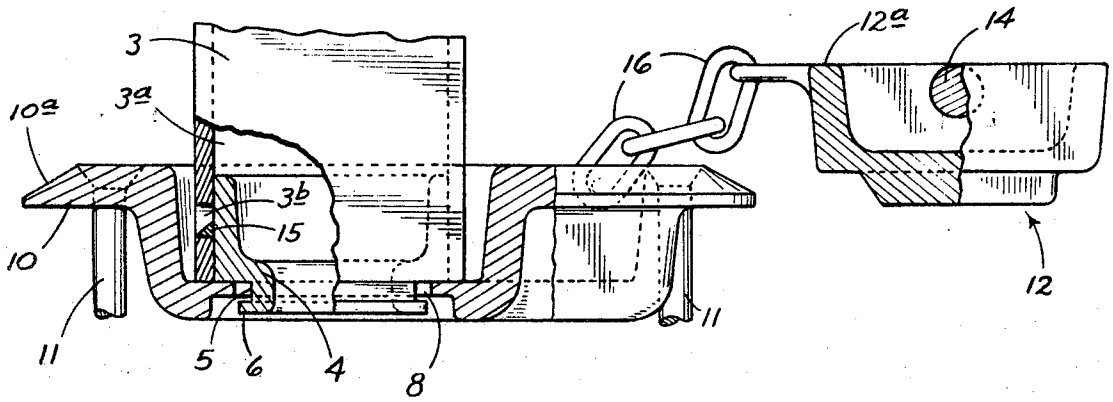
[56] **References Cited**

UNITED STATES PATENTS

617,623	1/1899	Young	105/369(B)
2,336,869	12/1943	Johnson	105/369(B)
2,603,167	7/1952	Webster et al.	105/369(B)
2,827,960	3/1958	Keating et al.	105/369(B)
2,994,285	8/1961	Dunlap	105/369(B)
3,342,142	9/1967	Miller	105/369(B)

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ABSTRACT: This development concerns load bracing members arranged vertically in a railroad freight car of the boxcar type. It is principally concerned with the loose mounting of said vertically disclosed load braces in related floor sockets so that said braces may easily be engaged and separated respectively when they are axially aligned. They are interfitted to accommodate movement of each brace in its floor socket, but yet inhibits inadvertent detachment therewith. That is said interfit of the braces and sockets at their lower ends accommodate lateral movement freely past axial alignment in any direction, particularly when they bear against cargo.



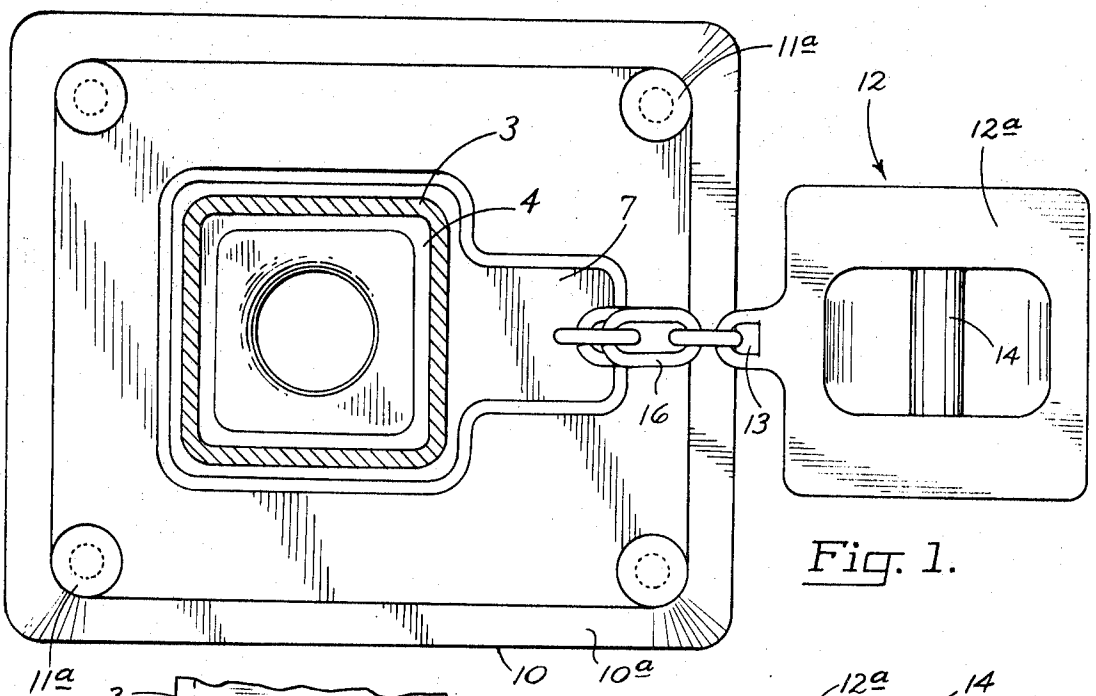


Fig. 1.

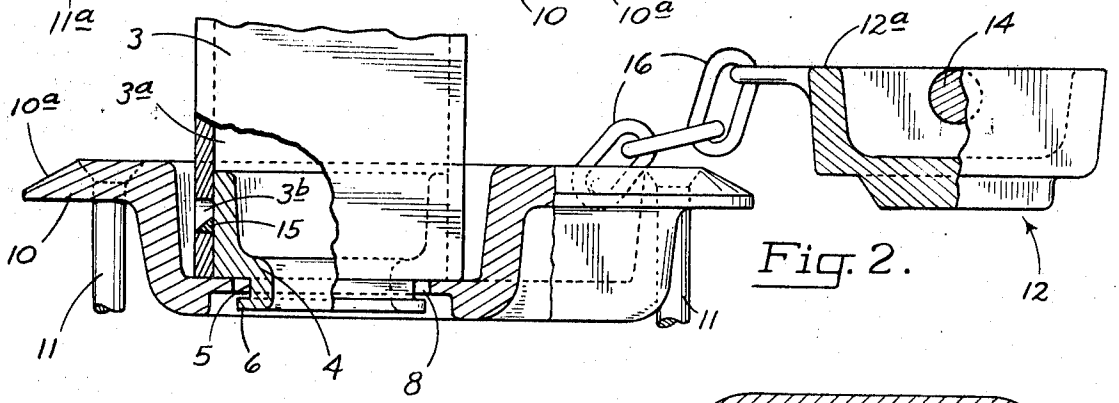


Fig. 2.

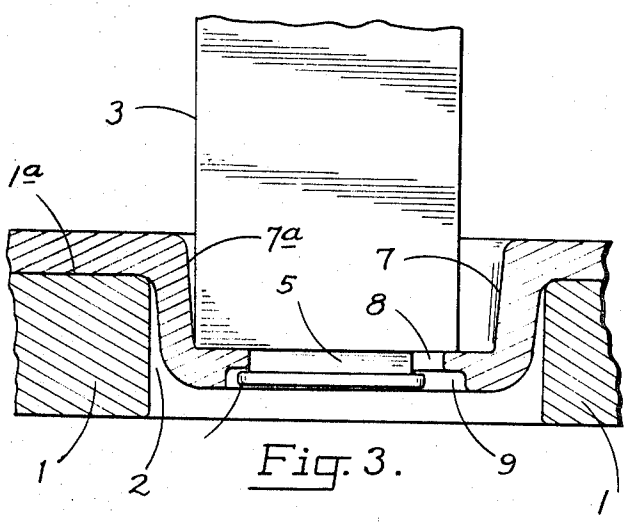


Fig. 3.

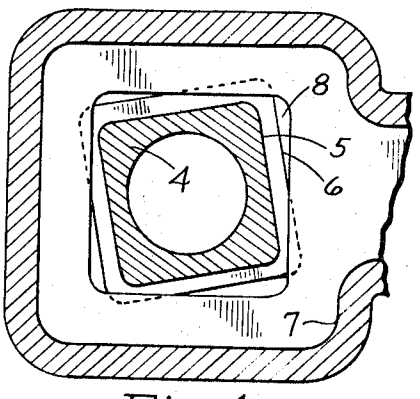


Fig. 4.

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SOCKET FITTING FOR BRACING POSTS

This invention relates to the general subject of removable post braces for railroad boxcars to prevent lateral shifting of cargo lodged within said car. In this general field of reference, this improvement relates generally to the subject matter involved in U.S. Pat. No. 3,342,142, entitled Bracing For Railroad Boxcar, which patent issued to me on Sept. 19, 1967.

It has been deemed necessary in the past to provide each socket for the lower end of a vertical post with an effective depth substantially greater than the thickness of a boxcar floor or decking so that the jostling and lateral movement of cargo in transit will not bounce the lower end of such posts out of engagement with its socket. This general relationship of socket to floor is illustrated in FIGS. 4, 5 and 6 of said U.S. Pat. No. 3,342,142, in which the floor or deck of a boxcar is indicated by reference character 7.

I have discovered that such inadvertent disengagement can be prevented with a relatively shallow socket of lesser depth than the thickness of said floor or deck if the lower post end for said socket is loosely interfitted with a flange in said socket so that said parts cannot become detached and separated unless they are first intentionally aligned with each other. That is, the loose interfit between the posts and the socket accommodate lateral movement of the former, but the interfitting portions of the post and socket inhibit inadvertent vertical detachment. If a loaded boxcar is in transit and the cargo is subject to the general vibration or jolting caused by the movement of the boxcar, these parts seldom come to rest in even approximate registration, and thus the overlapping parts restrict separation and the post end never comes to rest at a point of registration. That is to say, the degree of play permits the post end to pass the point of registration, both fore and aft of the car, respectively, as well as towards the sides thereof, respectively.

This advance in the art is particularly useful when general purpose boxcars, as presently constructed and devoid of posts and sockets, are to be fitted with the latter. The thickness of the floor accommodates only shallow sockets lying within the thickness of the floor or decking of the boxcar. The use of shallow sockets eliminates the necessity of cutting or deforming the stringers that extend across the side and center sills, which stringers are supported by the sills and they support in turn, the decking across the floor of the boxcar.

For example, decking for boxcars is usually made a scant 2 inches in thickness. This is true in present practice, independent of whether the decking is made of strips of car decking, of sheets of plywood or of metal sheets. The thickness of walls of a socket surrounding the well therein, usually permits a well approximately 1 ¾ inches deep to be formed for accommodating the ends of a post. The vibration of a boxcar in transit and the impacts incident to coupling, and also the jerking induced by acceleration and deceleration forces, which forces are particularly intense in long trains, cause the cargo to bounce and also the braces associated therewith to be thrown vertically upward a distance greater than the depth of the wells of the socket. Unless the posts are secured to the sockets in some way, dislodgment and consequent disconnection is produced. Thus, a secure hold of the lower end of the posts in the socket is required. The ends, however, cannot be jammed into the sockets to such a degree that they cannot readily be released at the destination, to permit the cargo to be discharged. That is to say, the interlock of the posts in the socket must be secure, but it must not be jammed to prevent ready loading and unloading, or to produce mutilation of the posts or their sockets which would prevent uncoupling or reuse during subsequent shipments.

As is disclosed in my U.S. Pat. No. 3,342,142, posts embodying my invention can be freed from cramping engagement effected by the cargo, by the use of lift trucks or fork trucks, which can nudge the cargo slightly to free it from pressure exerted on the post, and to permit the post to be shifted manually to a position of exact registration with its socket in the floor to effect disengagement of said parts when they are in vertical registration.

It is desirable that the rectangular posts illustrated herein and in said issued patent, permit the flat sides to engage the edges of rectangular bundles of cargo, such as plywood. Such cargos cant in transit and become out of alignment with the boxcar. To accommodate such canting or rotation about a vertical axis, it is desirable that a post rotate about its longitudinal axis so that there is always a flat face of a post in abutment with the cargo. This presents a wide area of contact to minimize damage to the cargo by the forces resisted in transit, and restrained by the bracing posts engaging the cargo.

Other structural and functional features of my invention and new results produced thereby are described and illustrated in greater detail in the accompanying drawings in which:

FIG. 1 is a plan view showing a socket and plug therefor joined by a flexible link, with the lower end portion of a post seated in said socket;

FIG. 2 is a side elevation of said parts with portions shown broken away to disclose details of construction of said socket and said plug, and with the lower end of a post provided with a flange or collar underlying an aperture in the well of a socket and lying in registration with said aperture to permit disengagement of said parts;

FIG. 3 is a detail sectional view of the lower end portion of a post interlocked in the socket by being arranged out of registry to inhibit detachment of said parts by vertical axial movement of the elongated post; and

FIG. 4 is a plan or horizontal section through a socket and the lower end of a post arranged therein, illustrating in dashed outline how the post may rotate about its longitudinal axis to a limited degree without releasing the interlock of the lower end of said post with its socket.

A boxcar adapted for use with my invention is provided with floor planking or decking 1, having spaced apertures 2 formed therein at predetermined modules dictated by the placement of posts 3 adapted to brace the cargo against lateral shifting. Said posts are hollow and are of rectangular section. At the lower end of each is a terminal fitting 4 having a restricted neck portion 5 axially arranged at one end thereof, and terminating in a collar portion 6 spaced from the main body of the fitting by the breadth of the neck portion. This is illustrated most clearly in FIGS. 2 and 3.

A socket 7 depends into a selected aperture 8 to a degree less than the thickness of the floor planking or decking 1. The neck portion 5 is rectangular, as is shown in FIG. 4, as is its collar portion 6. The collar portion 6 is only of slightly less width and breadth than the aperture 8, as is shown in FIG. 2. Thus, when the collar portion is in registry, both laterally and axially, it may be lifted through the aperture 8 with no great difficulty. If, however, it is shifted laterally, either up or down as shown in FIG. 4, or left to right, as also shown in said FIG., or is rotated, as is shown in dashed outline, the post cannot be lifted from the socket due to the overlap shown in dashed outline.

Below the aperture 8 as the parts lie in FIGS. 2 and 3, respectively, is a square recess 9 in the horizontal plane of which the collar portion 6 lies when the parts are in engagement or immediately prior to intentional lifting of the posts from the socket. These are shown in the positions illustrated in FIGS. 3 and 2, respectively. The thickness of the collar portion and the proportions of the recess are related so that the parts will not bind by slight tipping of the post. To a comparable degree, the collar portion has similar freedom of action laterally in the aperture 8 so that the bottom portion of the posts may rock or slide in response to forces exerting a lateral displacement of the cargo.

The terminal fitting 4 has square marginal overhang portions 10 that overlap the upper face 1*a* of the decking 1, which is the floor level of a boxcar. Said overhang portions bear on the upper face of the decking and the terminal fitting is held in place by locking bolts 11, which preferably have countersunk heads 11*a*, so that the upper face of the terminal fitting heads of the bolts lie in a plane. The marginal edges 10*a* of the overhang portions 10 are beveled, as is shown in FIG. 2, so that

when the posts 3 are removed, cargo will not "hang up" on the terminal fitting, even if not lifted up from the floor of the car by forklifts. If a car has no sockets, such as are illustrated and described, there is no need for bracing posts. Plug elements 12 may be inserted in the well of said sockets. The peripheral outline of said plug elements 12 is complementary with the configuration of the slotted side portions 7*a* of the sockets and thus the upper face 12*a* of the plug element will lie in the same plane as the upper surface of the socket. Said upper surface of the plug element 12 preferably is apertured at 13 and is provided with a bail or hand hold 14 to aid in gripping the plug element when it is to be lifted upwardly and removed from the socket 7, to permit the insertion of a post end in said socket.

The terminal fitting 4, carrying the neck and collar portions, is preferably cast of steel and fits tightly within the bore 3*a* of the post, as is illustrated in FIG. 2. This is preferably a press fit so that the terminal fitting will not become detached inadvertently. Additionally, a hole 3*b* extends through a flat side of a post near its lower end and a fillet or spot weld 15 is made, as is illustrated in FIG. 2, to bond the terminal fitting in place. This fillet or spot weld comprises welding steel and thus joins with the terminal fitting more strongly than with the post which is usually made of an aluminum alloy. It thus is more or less a key that prevents the terminal fitting from slipping outwardly from that end of the post.

A railroad boxcar fitted with post-type braces is illustrated in FIG. 2 of my U.S. Pat. No. 3,342,142. The lower ends of such braces fit within sockets and the upper end of each fits within a keeper carried by the roof of such boxcar. The spacing of the post responds to the dimension of the cargo being held against movement. When a post embodying the invention disclosed herein is to be located in a boxcar, its lower end is aligned with a socket, it is lowered into the well of said socket and the collar slid through the aperture 8 and into the recess 9. The manner in which the upper end of the post is secured, if it is secured, plays no part in my present invention, and it is thus not disclosed or described. With bulky cargo of light mass, the posts might not be secured at their upper ends, but usually they are secured in some fashion, either by keepers in the roof or by spanners or stretchers extending transversely of a car, as would be self-suggestive to a person skilled in the art. When the cargo arrives at its destination and is to be unloaded, if it is bulky and heavy, this is usually done with forklift trucks which are driven into the boxcar and their forks are placed under a stack of cargo. Forklift trucks can bump the cargo and take the lateral pressure from a post that is to be removed. Said posts thus may be manually adjusted and lifted without difficulty from their respective sockets. It is common practice to stack the posts at one end of a boxcar so that they will be out of the way and will not be lost or damaged. If a similar cargo requiring post braces is to be put aboard, the sockets are left unplugged. If, however, general cargo is to be carried on a return trip, plugs are inserted in the sockets to make a smooth floor over which vehicles may be run. Also, if cargo is carried that is unconfined or leaks badly, the plugs tend to prevent the wells in the sockets being filled.

As has been pointed out heretofore, the neck within the aperture 8 and the collar within the recess 9 are afforded substantial freedom of movement, both laterally and rotatively, as is shown in FIG. 4. If cargo shifts slightly or cants, the posts may rock or rotate therewith so that a flat side bears against the cargo rather than a corner thereof.

The four sides of each post and the four sides of the terminal fitting are symmetrical about a center axis and thus no great care is required in inserting the posts into the sockets when the railroad car is being filled. Likewise, no careful attention must be given to the posts to see that they are returned to a particular socket because they are interchangeable. The opposite ends of the posts differ from each other because it is only at the lower end that a terminal fitting must be secured, but this is readily discernable.

Although I found it desirable to make the posts of aluminum alloy so that they are of lightweight and yet are strong and make the terminal fittings and sockets of steel, I claim no novelty therefor and do not wish my invention to be limited thereto. Although each socket is provided with a plug element 12 secured by means of a flexible link or other type of fastening socket, this arrangement also does not play any important part of my invention, but is merely a convenience so that a boxcar is not limited to rectangular bundles of flat sheets, such as plywood, chipboard and hardboard for which a car embodying my invention has been specifically designed for movement to the midwest and to east coast areas from the Pacific Northwest, where such cargo originates.

I claim:

1. A socket element for lodging in the floor or decking of a freight car for receiving and holding the lower end of an elongated, releasable stake constituting a load brace, comprising:

a socket body having a marginal floor or decking engaging flange and a centrally depending pocket portion, said pocket portion having a floor section provided with an axially aligned aperture formed therein;

an elongated, releasable vertically disposed stake having a lower end and mounted in the pocket portion of said socket;

a terminal fitting carried by said lower end portion of said stake;

said terminal fitting having a constricted neck portion and an underlying collar portion, said neck portion and collar portion being aligned in stacked relation with said terminal fitting;

said terminal fitting having a cross-sectional area correlated with the pocket portion of said socket, being of greater area than the aperture in the floor section of the pocket, the collar portion having a cross-sectional area less than that of the pocket aperture, and the neck portion having an area less than that of the collar portion, and having a length greater than the thickness of the floor section of the pocket, thereby to accommodate lateral movement of the latter post and when it is arranged in the pocket portion of the socket; and

the terminal fitting part being thus proportioned with those of the pocket to prevent axial retraction of a post with its socket only when the axially aligned stacked parts are in vertical alignment with each other.

2. A socket element for lodging in the floor or decking of a freight car for receiving and holding the lower end of an elongated, releasable stake constituting a load brace, comprising:

a socket body having a marginal floor or decking engaging flange and a centrally depending pocket portion having a depth less than the thickness of the floor or decking of a freight car, said pocket portion having a floor section provided with an axially aligned aperture formed therein;

an elongated, releasable vertically disposed stake having a lower end and mounted in the pocket portion of said socket;

a terminal fitting carried by said lower end portion of said stake;

said terminal fitting having a constricted neck portion and an underlying collar portion, said neck portion and collar portion being aligned in stacked relation with said terminal fitting;

said terminal fitting having a cross-sectional area correlated with the pocket portion of said socket, being of greater area than the aperture in the floor section of the pocket, the collar portion having a cross-sectional area less than that of the pocket aperture, and the neck portion having an area less than that of the collar portion, and having a length greater than the thickness of the floor section of the pocket, thereby to accommodate lateral movement of the latter post and when it is arranged in the pocket portion of the socket; and

the terminal fitting part being thus proportioned with those of the pocket to prevent axial retraction of a post with its socket only when the axially aligned stacked parts are in vertical alignment with each other.

3. The organization of claim 1, modified in that the pocket portion of the socket being of greater cross-sectional area than the lower end of the post to permit lateral movement of the post end in the socket, limited rotation therein, and gyration of the lateral axis thereof.

4. The organization of claim 1, modified in that the cross-sectional areas of the post, the pocket, the aperture in the floor of the socket, the neck portion of the terminal fitting, and the collar, all being of rectangular shape.