

Nov. 20, 1951

F. FAHLAND  
CARGO-SUPPORTING CROSSBAR

2,575,550

Filed June 29, 1950

2 SHEETS—SHEET 1

Fig. 1

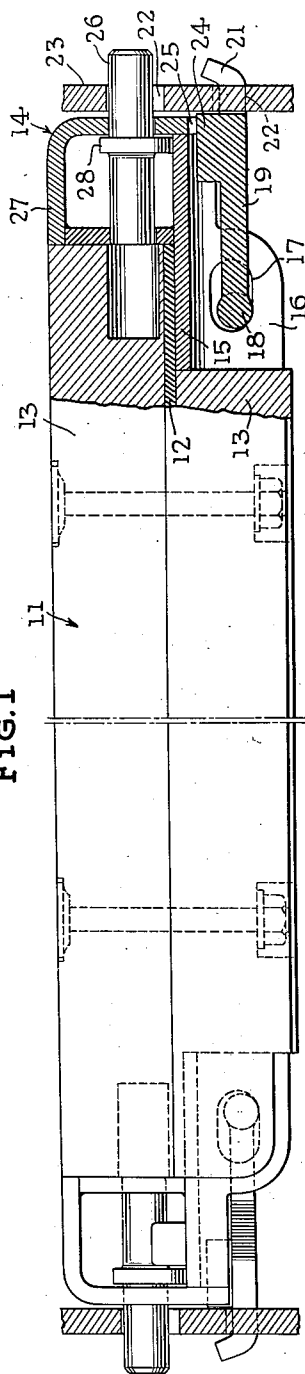


Fig. 2

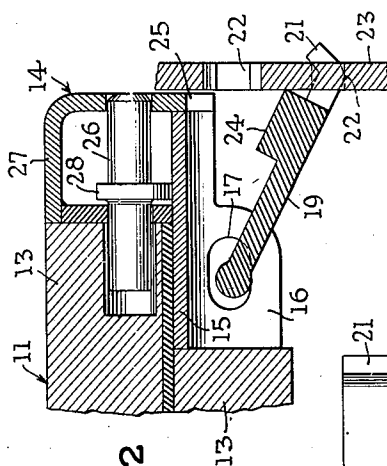


Fig. 3

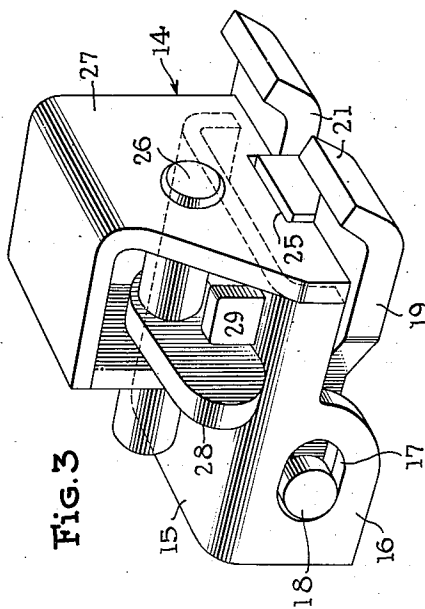


Fig. 4

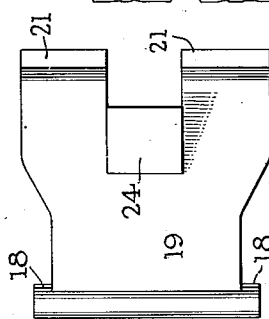
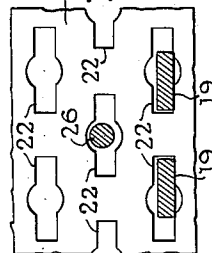


Fig. 5



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2 SHEETS—SHEET 2

Fig. 8

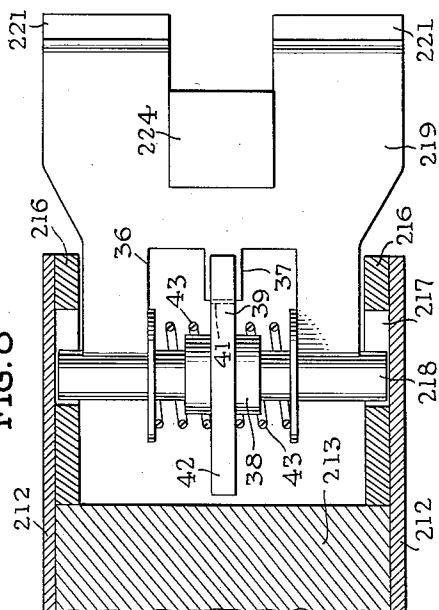


Fig. 9

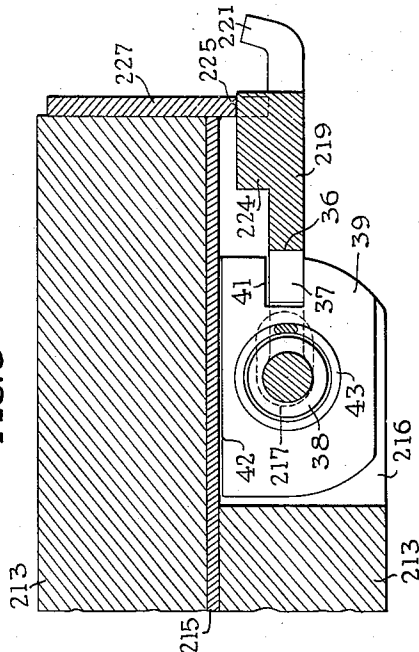
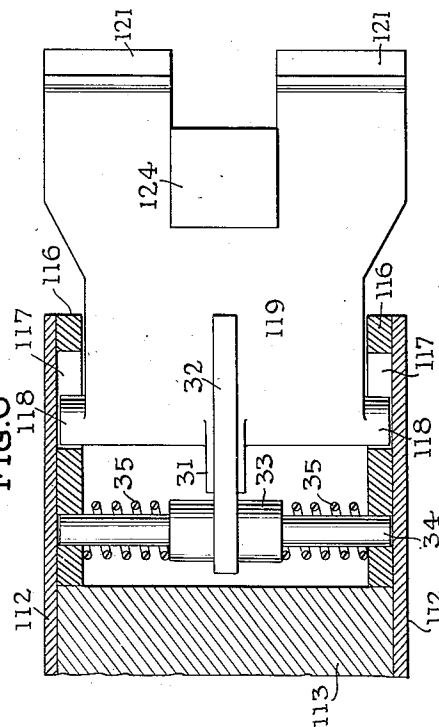


Fig. 6



## UNITED STATES PATENT OFFICE

2,575,550

## CARGO-SUPPORTING CROSSBAR

Frank Fahland, Omaha, Nebr.

Application June 29, 1950, Serial No. 171,059

8 Claims. (Cl. 105—369)

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This invention relates to load-supporting and load-bracing elements for use in transport vehicles such as freight cars, vans, ships and the like, and affords a simplified and improved construction for the attaching fittings for bars of the type shown in my Patents 2,440,437, April 27, 1948, and 2,476,362, July 19, 1949.

These prior patents disclose hook-ended members which are hinged to the lower side of the beam on transverse axes and can be swung upward into supporting engagement with the end of the beam. During such swinging motion hooked ends formed on said members enter selected apertures in an apertured, plate-like vertical support and engage the rear surface of the support so as to resist horizontal withdrawal. A novel feature of the present invention is the provision of means to extract the hooked ends forcibly as an incident to reverse swinging of the hook-ended members, such as occurs when the beam is dismounted.

In Patent 2,240,437 the hook-ended member swings on a pin-and-slot connection which accommodates variations in support-spacing and requires the use of secondary alining means. A second novel feature of the present invention is an arrangement such that the secondary alining means and the hook extracting means are combined in a single part.

Some sort of secondary locking means is desirable and even necessary. The embodiments shown in the Fahland patents make use of a bolt which is projected from the end of the beam and enters an aperture in the support. This is the simplest and strongest arrangement, and is preferred to those arrangements previously used in which the swinging member was pinned or latched to the bar so that it cannot swing away therefrom. Examples of spring latches for this purpose will be illustrated. These examples disclose distinct types of strong and simple construction which are readily manipulated. Also they serve to illustrate the general availability of the improved hook-ended connector.

In the drawings:

Fig. 1 is a side elevation of a complete bar with its opposite ends engaged in parallel vertical supports. The connecting device at the right-hand end is shown in axial section. The mid-portion of the bar is broken away to shorten the view and permit use of a large scale.

Fig. 2 is a section, similar to the right-hand end of Fig. 1, but showing how the hooked end is disengaged.

Fig. 3 is a perspective view of one of the con-

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necting devices. The swinging member is shown in the position it assumes when engaged. The bolt is shown retracted.

Fig. 4 is a plan view of the swinging hook-ended member.

Fig. 5 is a view on a reduced scale as compared with Figs. 1, 2 and 4, showing a fragment of the perforated wall plate with beam-supporting members inserted.

Figs. 6 and 7 are respectively horizontal and vertical sections of a first modification in which the swinging member is latched to the bar.

Figs. 8 and 9 are respectively horizontal and vertical sections of a second modification using a different type of latch.

Refer first to Figs. 1-5 inclusive.

The beam member is generally indicated by the numeral 11. As is the case with the beams in my two patents above identified, the beam is of a composite construction comprising a pressed steel shell 12 to which are bolted wooden filler pieces 13. So far as the present disclosure is concerned, the significant fact is that the metal housings for the end attaching means which are generally indicated by the numeral 14 are welded to the steel shell 12.

Each housing comprises a steel member 15 which is welded to the core 12 and which has down-turned flanges 16 formed with elongated apertures 17. The apertures 17 receive trunnions 18 on the end of the swinging member 19. Thus, the openings 17 and trunnions 18 afford a swinging-and-sliding connection of the pin-and-slot type. The mounting allows the member 19 to swing on a horizontal axis between a pendant disengaged position, and a horizontal position in which it engages portions of the housing 14. The swinging member 19 has a hook-shaped end. In the example illustrated there are two hooked portions 21 spaced apart so that the member 19 will engage two of the apertures 22 formed in the corresponding supporting plate 23 (see Fig. 5). It is probably unnecessary to state that plates such as 23 are used as linings for freight cars and the apertures are provided to offer opportunity for the attachment of horizontal load-sustaining beams such as the beam 11.

Formed on the upper face of the member 19 is a heavy boss 24. When the member 19 is in beam-supporting position, the boss 24 enters a notch 25 (see Fig. 3) which is formed in a part of the housing 14 to receive and laterally confine it. Thus, when the member 19 is in beam-supporting position (consider Figs. 1 and 3), the

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boss 24 engages the notch 25 and prevents transverse motion of the part 19 in the direction of the axis of the trunnions 18.

The boss 24 performs a second function which is clearly illustrated in Fig. 1. As there shown it is close to the inner face of the plate 23 and limits the entrance of the hooked ends 21. In conjunction with the hooked ends it prevents lateral cocking of the member 19 relatively to the corresponding plate 23.

The boss 24 also performs a third function which is clearly illustrated in Fig. 2. When the end of beam 11 is lifted for the purpose of disengaging the swinging member 19 from the plate 23, the corner of the boss 24 strikes the inner face of the plate 23 and causes withdrawal of the hooked ends from the plate. In one sense the member 24 acts as a sort of cam and in another sense it acts as a fulcrum. It might function as each at different times but whatever the function it has the effect of withdrawing the hooks positively and quickly by the simple operation of lifting the end of the beam.

It is important to prevent the end of the beam from rising accidentally and thus disengaging itself from the plate 23. For this purpose use is made of a bolt 26 which when projected as shown in Fig. 1 enters a third one of the apertures in plate 23.

To guide the bolt 26, the housing 14 includes an inverted U-shaped portion 27. The bolt 26 is guided in holes formed in the portion 27 and may be shifted to and from its engaging position by a finger piece 28. A lug 29 welded to the top of plate 15 serves as a stop to hold the bolt 26 selectively in its engaged and in its disengaged positions. The bolt is freed by lifting the finger piece 28 far enough to clear the lug 29, is shifted longitudinally and is then locked by swinging the finger piece downward so that it engages one or the other side of the lug 29.

Bolt 26 prevents rise of the end of the beam 11 and consequently makes it impossible for the swinging member 19 to move away from the lower face of the beam. As a consequence, the boss 24 is maintained in engagement with the notch 25, and the hook-shaped ends 21, by their engagement behind the plate 23, prevent the horizontal withdrawal of the member 19 from the plate. The pin-and-slot connection 17, 18 accommodates errors in the spacing of the lining plates 23 which may result from various causes.

The construction above described is the preferred one but the advantages of the invention can also be had in a type of construction in which the swinging member is latched to the beam so that it cannot move away from the end of the beam. In such a construction entire reliance is placed on the swinging member 19 and its two hooked ends 21.

In the first modification shown in Figs. 6 and 7 parts similar to parts in Fig. 1 are given the same reference numerals increased by 100. The member 119 is confined between the flanges 116 and has trunnions 118 engaging the elongated slots 117. Member 119 is formed with an extension 31 which extends beyond the trunnions 118 in a direction away from the hooked end 121. The member 119 is locked into engaging position shown in Figs. 6 and 7 by an L-shaped bar 32 which enters between the extension 31 and a portion of the housing 115 (see Fig. 7). The L-shaped member 32 is fixed on a sleeve 33 which is slidable on a cross pin 34 and is centered thereon by two coil compression springs 35. These

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are mounted under virtually no stress and normally merely center the member 32.

As will be apparent from an inspection of Fig. 6, the member 32 may be shifted laterally in either direction far enough to clear the lug 31. Thereupon the member 119 is free to swing downward and the member 31 will hold the member 32 displaced. Restoration of the member 119 to its upper position (see Fig. 7) will result in the restoration of the member 32 to its normal position.

The construction shown in Figs. 8 and 9 is quite similar to that shown in Figs. 6 and 7. In these views parts that are generally similar to those shown in Fig. 1 are given the same reference numerals increased by 200.

Member 219 is cut away in its mid-portion as indicated at 36 and is there provided with a lug 37 which projects into this space. The trunnion 218 is continuous and supports an axially shiftable sleeve 38. This sleeve carries a disk 39 having a notch 41 dimensioned to straddle the lug 37, and having one secant face 42 which is adjacent to the face of the shell 215, as best shown in Fig. 9. The member 39 is centered by two light springs 43 very much as the sleeve 33 of Fig. 6 is centered by the springs 35. It can be moved in either direction to clear the lug 37.

These arrangements have the advantage that the members 32 and 39 can be shifted in either direction to release the device and lie wholly within the dimensional limits of the beam. As a consequence, they interfere with nothing and are readily accessible for manipulation.

#### I claim:

1. Means for locking the end of a beam in abutting relation to an apertured plate-like support to which the beam is substantially perpendicular, comprising in combination with the beam; means carried by the beam and affording a hinge axis transverse to the beam and adjacent to but spaced from said end thereof; a connecting member hinged on said axis and having a hook-shaped end adapted to enter an aperture in the support, as said connecting member is swung about said axis toward a beam-supporting position in which said member is in lateral contact with the beam adjacent said end thereof; and a hook extracting lug carried by said connecting member and serving to engage and react against said support to cause withdrawal of said hook-shaped end as the connecting member swings away from said beam-supporting position.

2. Means for locking the end of a beam in abutting relation to an apertured plate-like support to which the beam is substantially perpendicular comprising, in combination with the beam; a connecting member having a hook-shaped end adapted to enter an aperture in said support as said connecting member is swung towards lateral contact with an end portion of the beam about an axis spaced from the end of and transverse to the beam; means affording a swinging and sliding connection between the other end of said connecting member and a part of the beam spaced from the end thereof, said connection affording the transverse axis aforesaid, and including slot means permitting motion of said connecting member in the direction of the length of the beam; an extracting lug carried by said connecting member in position to engage said support and forcibly withdraw the hook-shaped end from said aperture as an incident to reverse swinging motion of said member; and aligning means affording engagement

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between the connecting member and the beam, at least when said hook-shaped end is engaged in said support, said alining means comprising a lug and slot, one extending longitudinally of the beam and the other extending longitudinally of said member, the lug and slot being so formed as to have lateral inter-engagement and end clearance to resist lateral and permit longitudinal relative motion.

3. The combination defined in claim 2 in which the extracting lug serves also as said alining lug, the alining slot being formed in a lateral portion of the end part of the beam.

4. Means for locking the end of a beam in abutting relation to an apertured plate-like support to which the beam is substantially perpendicular comprising, in combination with the beam; a connecting member having a hook-shaped end adapted to enter an aperture in said support as said connecting member is swung toward lateral contact with an end portion of the beam about an axis spaced from the end of and transverse to the beam; means affording a swinging-and-sliding connection between the other end of said connecting member and a part of the beam spaced from the end thereof, said connection affording the transverse axis aforesaid, and including slots permitting motion of said connecting member in the direction of the length of the beam; an extracting lug carried by said connecting member in position to engage said support and forcibly withdraw the hook-shaped end from said aperture as an incident to reverse swinging motion of said connecting member; alining means affording engagement between the member and the beam, at least when said hook-shaped end is engaged in an aperture

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in said support, said alining means comprising a lug and slot, one extending longitudinally of the beam and the other extending longitudinally of said connecting member and so formed as to have lateral inter-engagement and end clearance to resist lateral and permit longitudinal relative motion; and secondary locking means shiftable to a position in which it prevents said reverse swinging motion of the connecting member, at least when said hook-shaped end is engaged in an aperture in the support.

5. The combination defined in claim 4 in which the extracting lug serves also as said alining lug, the alining slot being formed in a lateral portion of the end part of the beam.

6. The combination defined in claim 4 in which the extracting lug serves also as said alining lug, the alining slot being formed in a lateral portion of the end part of the beam, said lug being so located and dimensioned that it serves also to limit the entrance of the hook-shaped end of the member into openings in said support.

7. The combination defined in claim 4 in which said secondary locking means is guided on and supported by the beam and engages in an aperture in said support.

8. The combination defined in claim 4 in which the secondary locking means is a shiftable stop guided on and supported by the beam and adapted in one position to engage a side of said connecting member so as to resist swinging motion thereof away from the beam while permitting the longitudinal motion afforded by said swinging-and-sliding connection.

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No references cited.