

Sept. 15, 1953

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2,652,005

CARGO BRACE STRUCTURE

Original Filed July 23, 1951

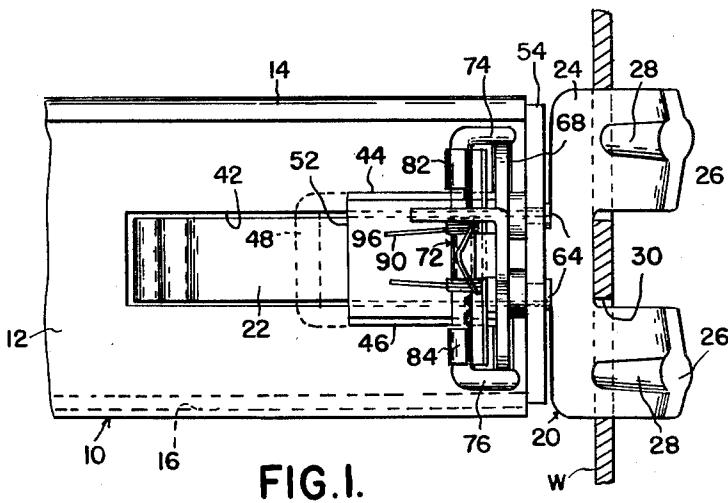


FIG. 1.

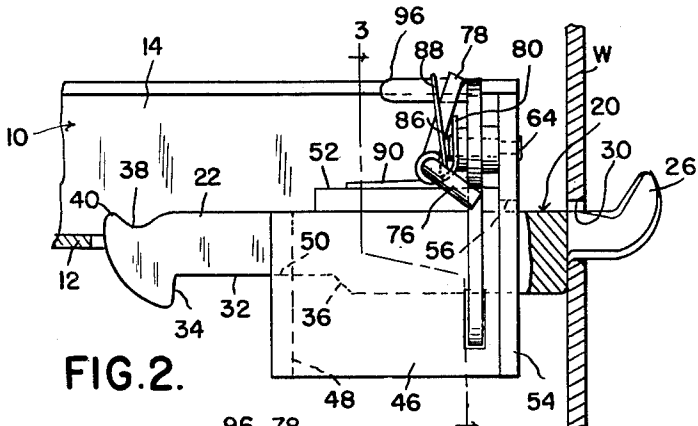


FIG. 2.

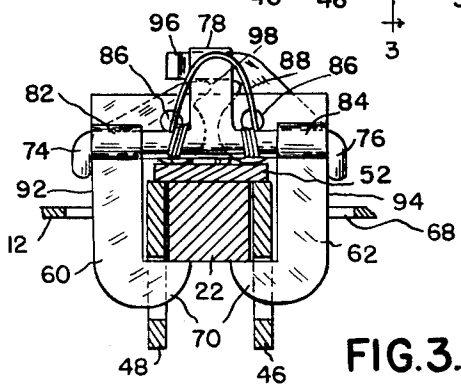


FIG. 3.

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2,652,005

CARGO BRACE STRUCTURE

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Original application July 23, 1951, Serial No.
238,099. Divided and this application July 28,
1952, Serial No. 301,359

18 Claims. (Cl. 105—369)

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The present invention relates to cargo brace structure comprising an elongated cross bar having at opposite ends thereof movable supporting heads adapted to fit into and interlock in openings provided in a pair of confronting spaced apart side walls. Cargo braces of this type are widely used in railroad cars, trucks, airplanes and the like, for bracing cargo against movement during transit.

The present invention is an improvement over the structure disclosed in my prior Patent No. 2,567,658, granted September 11, 1951. The present application is a division of my prior copending application Serial No. 238,099, filed July 23, 1951, and entitled "Cargo Brace Structure."

It is an object of the present invention to provide a cargo brace comprising an elongated bar, a supporting head carried at one end of the bar with provision for rocking movement about an axis transverse to the length of the bar, and preferably for movement longitudinally of the bar, in conjunction with latch means operable to retain the movable head in supporting position against rocking movement, and lock means preventing accidental release of the latch means.

More specifically, it is an object of the present invention to provide in apparatus of the character described, a pair of movable latch members mounted for rocking movement toward and away from the movable head, lock means preventing accidental release of said latch members, spring means biasing said lock means to locking position, and abutment means causing the lock means to bias the latch members toward latched position.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a plan view of a head supporting assembly carried at one end of a cross bar showing a portion of the supporting wall in section.

Figure 2 is a side elevation partly in section of the head supporting structure.

Figure 3 is a section on the line 3—3, Figure 2.

In the figures the cross bar is illustrated generally at 10 and as disclosed in my prior Patent No. 2,567,658, may comprise a transverse horizontal web 12 having an upstanding flange 14 at one side thereof and a depending flange 16 at the other side thereof. If desired, the cross bar may be completed by elongated wood bars respectively seated in the spaces between the central web 12 and the flange 14 and between the central web 12 and the flange 16. Cross bars of

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this type are well known and have the advantage of presenting wood exterior surfaces throughout their length for engagement with cargo.

At one end of the cross bar, and preferably at both ends thereof, there is mounted a supporting head 20 which as illustrated herein comprises an elongated shank 22 terminating at its outer end in a laterally extending portion 24 provided at opposite ends thereof with a pair of upwardly curved hooks 26. Each of the hooks 26 is provided with a central thickened rib 28 and the hooks are shaped to be received in openings 30 formed in the walls W. It will be observed that in operative position, as best seen in Figure 2, the ends of the hook portions 26 extend above the upper surfaces of the openings 30 and that accordingly, the hooks 26 cannot be withdrawn from the openings except in conjunction with a swinging movement of the heads 20 in clockwise relationship relative to the cross bars 10.

The shanks 22 of the heads 20 are provided with reduced portions 32 terminating adjacent the rear of the heads 20 in shoulders 34 and terminating forwardly of the heads in inclined shoulders 36. The inner or rear ends of the heads 20 are provided with transversely extending recesses 38 leaving abutment shoulders 40 for a purpose which will presently be described.

The transverse web 12 of the cross bar is provided with an elongated slot 42 in which the head 20 is movably received.

The movable head 20 is supported in a housing comprising a pair of side walls 44 and 46 interconnected by a rear wall 48. The side walls occupy lateral extensions in the slot 42 and extend both above and below the horizontal web 12 of the cross bar. However, the rear wall 48 is cut away and terminates in a shoulder 50, as best seen in Figure 2, on which the reduced portion 32 of the head is supported. A plate 52 is connected to the upper edges of the side walls 44 and 46 and overlies the intermediate portion of the shank 22 of the head 20. The housing structure is completed by an end plate 54 which may be welded or otherwise secured to the forward edges of the side walls 44 and 46 and the forward edge of the plate 52, as well as the adjacent end surfaces of the cross bar. The end plate 54 is provided with a vertical slot 56 in which the forward end of the shank portion 22 of the head is movable.

With the parts in the position illustrated in Figure 2, it will be observed that weight applied to the cross bar 10 is supported by the hook portions 26 of the head, thereby tending to rock the

head 20 in a counterclockwise direction about the pivot axis established by shoulder 50. Such counterclockwise rotation however is prevented by engagement of the shank 22 with the plate 52 which engages the upper surface of the shank of the head outwardly of the shoulder 50. It will further be observed that the shoulder 50 of the rear wall constitutes a fixed pivot support about which the head 20 may rock. Thus, in order to withdraw the head 20 from the openings 30 in the wall W the end of the cross bar structure is raised and the head 20 will thereupon rotate relative to the end of the cross bar in a clockwise direction, thus permitting withdrawal of the hooks 26 from the openings 30. When the head 20 is withdrawn from the opening 30 it is retained in assembly with the cross bar by engagement between the shoulder 34 and the rear wall 43 and also simultaneous engagement between the shoulder 40 and the inner end of the top plate 52.

It will also be observed that in the assembled relationship illustrated in Figure 2, the head is longitudinally movable with respect to the cross bar and will therefore accommodate relative approach and separation between a pair of opposed walls W.

In order to prevent inadvertent separation between the cross bars and the walls W, latch means are provided associated with the head which prevent movement of the head relative to the cross bar in the direction which is required to effect removal of the head from the openings in the wall. This means comprises a pair of latch members 60 and 62. The latch members are pivoted to pivot pins 64 carried by the front plate 54. The web 12 of the cross bar is provided with slots 68 through which the latch members extend providing for limited movement thereof, this movement however being sufficient to permit withdrawal of the hook portions 70 of the latch members from beneath the shank 22 of the head 20.

Means are provided which are effective to lock latch members 60 and 62 in the latching position shown in Figure 3. This means comprises a yoke member 72 having laterally extending arms 74 and 76 and provided intermediate the arms 74 and 76 with an actuating finger piece 78. The yoke 72 is carried on the plate 52 by a pivot support 80 having ears 82 and 84 constituting hinge or pivot supports for the intermediate portion of the yoke 72. The support 80 may conveniently be secured in place by the inner ends 86 of the pivot pins 64. It will be observed that the axis of the pivot support provided by the ears 82 and 84 is somewhat below the axes of the pivot pins 64, the arrangement being such that the arms 74 and 76 may be moved between positions above and below the horizontal plane containing the axes of the pivot pins 64.

Spring means 88 are provided including an upwardly looped portion engaging the rear surface of the finger piece 78 and an inwardly extending portion 90 resting upon the upper surface of the plate 52. The spring is designed so as to apply a clockwise torque to the yoke 72 tending to move its locking arms 74 and 76 downwardly to the locking position best illustrated in Figure 2.

The inner surfaces of the locking arms 74 and 76 engage the outer surfaces 92 and 94 of the latch members 60 and 62 respectively. Inasmuch as the arms 74 and 76 in locking position engage the surfaces 92 and 94 below the horizontal plane containing the axes of the pivot pins 64, it will be apparent that the arms in this po-

sition positively prevent relative outward movement of the latch members 60 and 62 to release position. However, it will be observed that when the finger piece 78 is moved counterclockwise as seen in Figure 2, arms 74 and 76 swing upwardly to be located above the horizontal plane containing the axes of the pivot pins 64 at which time outward movement of the latch members 60 and 62 is permitted. It will further be apparent that the spring which biases the arms 74 and 76 downwardly will be effective through the engagement between the arms 74 and 76 and the surfaces 92 and 94 respectively to establish forces resiliently biasing the latch members 60 and 62 inwardly toward latched position when they are in outwardly displaced release position. Thus, no independent spring means are required to provide forces biasing the latch members 60 and 62 toward latched position.

One of the latch members, and in the illustrated embodiment the latch member 62, is provided with an upwardly extending finger piece 96 which is located at the opposite side of the pivot pin 64 from the main part of the latch member 62. Obviously, downward pressure applied to the finger piece 96 tends to rock latch member 62 outwardly in a counterclockwise direction toward release position. The remaining latch member, and in the illustrated embodiment the latch member 60, is provided with an ear 98 best seen in Figure 2, which underlies a portion of the laterally extending finger piece 96 so that downward swinging movement of the finger piece 96 applies pressure to the ear 98 and results in clockwise rocking movement of the latch member 60 toward release position.

Thus, in order to disengage the cargo brace from the wall W, the operator first presses the finger piece 78 downwardly, swinging arms 74 and 76 upwardly to unlocked position, and thereafter applies pressure to the finger piece 96 thereby swinging latch members 60 and 62 outwardly.

With the cargo brace disengaged from the wall the head 20 may depend downwardly therefrom or if desired, it may be relatched. In order to relatch the head 20 it is necessary to press the finger piece 78 downwardly to unlock the latch members 60 and 62, after which the head may be swung upwardly and will cam the latch means outwardly as a result of engagement between the shank 22 of the head and the inclined surfaces at the bottoms of the hook portions 70 of the latch members.

The drawings and the foregoing specification constitute a description of the improved cargo brace structure in such full, clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. A cargo brace adapted to extend between a pair of spaced apart walls comprising a bar, an elongated supporting head connected to said bar adjacent but inwardly from an end thereof for pivoting movement about an axis transverse to the length of said brace and having a part adapted to extend beyond the end of said bar and engage in an opening in one of said walls, an abutment on said bar engageable with said head intermediate its pivot axis and the end of said bar, a latch member pivoted to said bar and including a latch portion adapted to engage said head at the side opposite said abutment and outwardly from the pivot axis of said head to support said head against swinging movement, and manu-

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ally releasable lock means cooperating with said latch member to prevent movement of said latch member.

2. A cargo brace adapted to extend between a pair of spaced apart walls comprising a bar, an elongated supporting head connected to an end of said bar for movement longitudinally of said bar and for pivoting movement about an axis transverse to the length of said bar and adapted to engage in an opening in one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a latch member pivoted to said bar and including a latch portion adapted to underlie said head outwardly from said pivot axis to support said head against downward swinging movement, and manually releasable lock means cooperating with said latch member to prevent movement of said latch member.

3. A cargo brace adapted to extend between a pair of spaced apart walls comprising a bar, an elongated supporting head connected to an end of said bar for pivoting movement about an axis fixed with respect to said bar and extending transversely thereof, said head being adapted to engage in an opening in one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a latch member pivoted to said bar and including a latch portion adapted to underlie said head outwardly from said pivot axis to support said head against downward swinging movement, and manually releasable lock means cooperating with said latch member to prevent movement of said latch member.

4. A cargo brace adapted to extend between a pair of spaced apart walls comprising a bar, a supporting head connected to an end of said bar for pivoting movement about an axis transverse to the length of said bar and adapted to engage in an opening in one of said walls, an abutment on said bar above said head and outwardly of the pivot axis of said head, a latch member pivoted to said bar and including a latch portion adapted to underlie said head outwardly from said pivot axis to support said head against downward swinging movement, and manually releasable lock means cooperating with said latch member to prevent movement of said latch member, said latch member and lock means including cooperating parts effective to move said latch portion from beneath said head, and resilient means on said lock means effective to apply a resilient force tending to restore said latch member to latch position.

5. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head pivotally supported adjacent one end of said bar and releasably engageable with means on one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws on said bar outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof.

6. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head mounted at one end of said bar for movement longitudinally thereof and for rocking movement about an axis transverse thereto and releasably engageable with means on one of said

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walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws on said bar outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof.

7. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head pivotally supported at one end of said bar and releasably engageable with means on one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws on said bar outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof, and abutment surfaces on said jaws engageable by said arms on movement of said yoke to locking position effective to swing said jaws to latching position upon movement of said lock in locking direction.

8. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head pivotally supported at one end of said bar and releasably engageable with means on one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws on said bar outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof, abutment surfaces on said jaws engageable by said arms on movement of said yoke to locking position effective to swing said jaws to latching position upon movement of said lock in locking direction, and resilient means urging said lock in locking direction.

9. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head mounted at one end of said bar for movement longitudinally thereof and for rocking movement about an axis transverse thereto and releasably engageable with means on one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws on said bar outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof, abutment surfaces on said jaws engageable by said arms on movement of said yoke to locking position effective to swing said jaws to latching position upon movement of said lock in locking direction, and resilient means urging said lock in locking direction.

10. A cargo brace adapted to extend between a pair of opposed walls comprising a bar, a supporting head pivotally supported at one end of said bar and releasably engageable with means

on one of said walls, an abutment on said bar above said head and located between the pivot support of said head and the outer end thereof, a pair of latch jaws mounted for swinging movement about a common axis on said bar and located outwardly of the pivot support of said head and disposed on opposite sides of said head to swing toward and away from said head to latch or release said head, a lock for said latch jaws comprising a yoke pivoted to said bar including arms straddling said jaws to prevent outward movement thereof.

11. A cargo brace adapted to extend between a pair of spaced apart walls having aligned openings therein, said brace comprising a bar having a supporting head at one end thereof, said head comprising a shank and upwardly extending hook means located beyond the end of said bar and movable into and out of a selected opening in a wall, a pivot member on said bar engaging said shank intermediate the ends thereof to support said head for swinging movement about an axis transverse to said bar, abutment means on said bar overlying said shank intermediate said pivot member and the end of said bar to limit upward movement of said head, pivot means on said bar located above said head and intermediate said pivot member and the end of said bar, a pair of latch members carried by said pivot means for swinging toward and away from said shank, abutments on said latch members movable into position beneath said shank to prevent downward swinging of said head, a latch lock device pivotally mounted on said bar including a pair of arms movable into and out of a position in which they engage the laterally outward sides of said latch members below said pivot means to prevent outward swinging of said latch members to head releasing position.

12. A cargo brace as defined in claim 11 in which said latch lock device comprises resilient means biasing said arms to locking position.

13. A cargo brace as defined in claim 12 in which said arms are movable vertically and the outer surfaces of said latch members are shaped to be engaged by said arms to urge said latch members inwardly toward latched position.

14. A cargo brace as defined in claim 11, one of said latch members having a rigid extension constituting an actuating finger piece for swinging said latch member outwardly to release position, and abutment means on said latch members effective to swing said other latch member outwardly upon outward swinging of said one latch member.

15. A cargo brace adapted to extend between a pair of spaced apart walls having aligned openings therein, said brace comprising a bar having a supporting head at one end thereof, said head comprising a shank and upwardly extending hook means located beyond the end of said bar and movable into and out of a selected opening in a wall, a pivot member on said bar engaging said shank intermediate the ends thereof to support said head for swinging movement about an axis transverse to said bar, abutment means on said bar overlying said shank intermediate said pivot member and the end of said bar to limit upward movement of said head, pivot means on said bar located above said head and intermediate said pivot member and the end of said bar, a pair of latch members carried by said pivot means for swinging toward and away from said shank, abutments on said latch members movable into position beneath said shank to prevent downward swinging of said head, a latch lock device comprising a yoke mounted on said bar above said head for rocking movement about an axis transverse to said bar, said yoke comprising rigid spaced arms engageable with the laterally outer surfaces of said latch members, said arms being movable upon rocking of said yoke from a locking position in which they engage the laterally outer surfaces of said latch means below the pivot axes thereof to a release position in which they permit outward swinging of said latch means to release position.

16. A cargo brace as defined in claim 15, and resilient means operatively connected to said yoke urging said arms to locking position and cooperating cam surfaces on said arms and latch members urging said latch members inwardly to latched position.

17. A cargo brace as defined in claim 16 in which said arms are movable to positions above the pivot axes of said latch members to unlock said latch members.

18. A cargo brace as defined in claim 17 comprising a rigid lever for swinging one of said latch members outwardly to release position, and means operable by outward swinging of said one latch member to swing said other latch member outwardly.

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No references cited.