Nov. 11, 1969 D. F. LEWIS 3,477,104

CARGO STRAP CLIP

Filed Nov. 22, 1967

Fig. 3

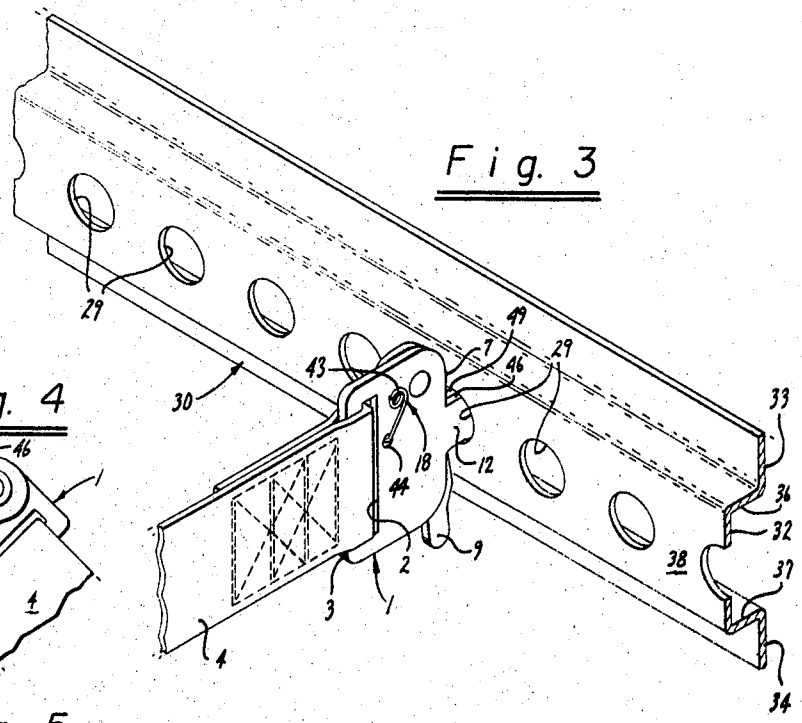


Fig. 4

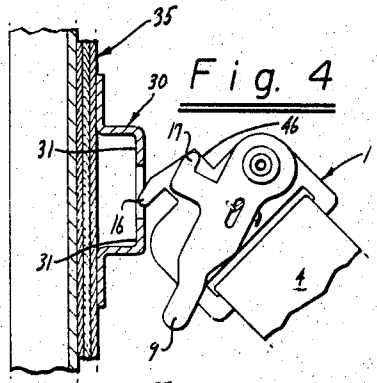


Fig. 5

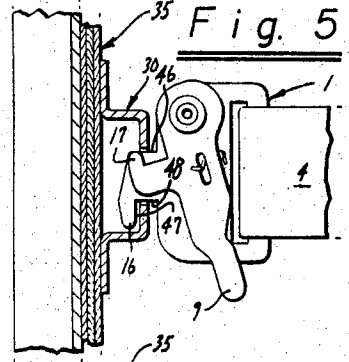
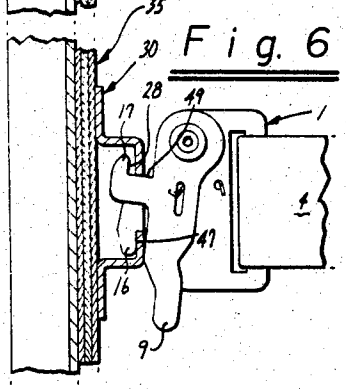


Fig. 6



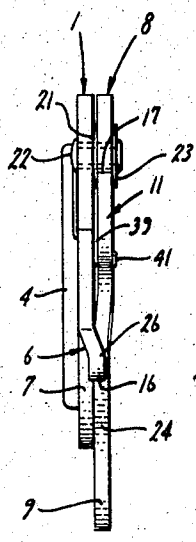
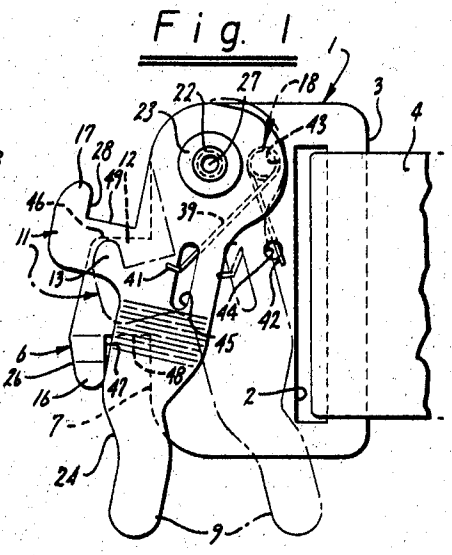


Fig. 2

Fig. 1



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CARGO STRAP CLIP

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U.S. Cl. 24—201 8 Claims

ABSTRACT OF THE DISCLOSURE

This specification discloses a cargo strap clip consisting of a strap plate secured to a load holding member, a trigger member pivotally connected to the strap member, the strap plate and trigger member having projections adapted for coupling with the side walls of an opening, and means biasing the projections to a locking position.

BACKGROUND OF THE INVENTION

Several systems for securing non-bulk cargo in airplanes, trucks and railroad cars have been devised. Some of these systems provide openings in the walls of the cargo carrier or an elongated rail having openings at spaced intervals is attached to the side walls. These openings are provided on opposite walls and straps or rigid members are placed across the load space to prevent the load from shifting. The straps are provided with belt shortening or cinching devices and devices at the ends of the belts for releasably anchoring the ends to the side walls. The present invention relates to the latter devices. Specifically this invention relates to apparatus in which all of the movable parts are located in the device attached to the belt and the only supportive apparatus on the wall is an opening in the wall or a rail such as the one shown in FIGURE 3.

The problem with the prior art devices is that they require several manipulative operations to attach or detach the end of the cargo strap to the side walls of the cargo vehicle. Applicant discovered a way of constructing a device that could be attached or detached to a cargo wall by simply pivoting one part and moving the device into an opening with a downward rotating motion and then releasing the device.

SUMMARY

The gist of the invention is the discovery of a particular shape of coupling member and a particular direction of entry and egress from an opening for releasably coupling a strap holding device to the side walls of a cargo vehicle.

Objects of the invention are:

To provide a cargo strap clip which is inexpensive, durable, easy to use and which may be quickly attached or detached to the side walls of a cargo vehicle;

To provide a device which may be coupled or detached even though the strap is under some tension;

To provide a device that can be operated by one hand actuated by one finger; and

To provide a device that is not easily damaged in use.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a side elevation of the device constructed in accordance with the present invention.

FIGURE 2 is a front end elevation of the device.

FIGURE 3 is a perspective view of the device connected to a side rail.

FIGURES 4, 5, and 6 are side views of the device on a reduced scale showing the device in varying positions in relation to a cargo rail attached to a side wall shown in cross section.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The cargo strap clip of the present invention consists briefly of a strap plate **1** having an opening **2** at one end **3** for receiving an elongated load holding member **4**, and formed with an L-shaped portion **6** projecting from the opposite end **7**; an elongated trigger member **8** pivotally connected to the strapplate having a finger engageable portion **9**, the member having a J-shaped portion **11** projecting therefrom and the stems **12** and **13** of the L and J-shaped portions extending generally in the same direction and being in side to side relation and the distal ends **16** and **17** extending in opposite directions; and means **18** shown as a spring biasing the distal portions in opposite directions.

The strap plate may be formed from metal or other rigid materials in various shapes. Preferably the plate has a sufficient height so that where nylon or other types of belting or straps are used it is unnecessary to bend or fold them. The manner also in which the strap is attached to the plate is unimportant, but one satisfactory method is to make a slot in the plate slightly longer and wider than the strap. The slot preferably should be parallel to the longest dimension of the plate and parallel to the wall surface to which the clip is to be attached.

The trigger member also is preferably made from metal and is pivotally attached to the strap plate by any means permitting free movement between the two parts. As here shown, a washer **21** separates the two parts which are joined by a rivet **22**. A washer **23** between the rivet end and the face of the trigger member improves ease of rotation.

The finger engageable portion is here shaped with a curved section **24** to permit a finger to be more easily inserted between the wall and the trigger member. The finger engageable portion extends beyond the strap plate.

In order to present the trigger member in a position easy for engagement, a stop means **26** is provided limiting the pivotal swing of the trigger member. A boss on the strap plate or a rivet could serve but a more economical solution is to offset the distal end of the L-shaped portion sufficiently to catch the trigger member.

One of the features of the present invention is the fact that the greater the load on the clip, the more firmly the clip holds to the anchoring wall or rail. This is accomplished by positioning the pivot **27** offset from the protruding portion of the trigger member in the direction of the distal portion. Specifically, as the load builds on edge **28** it tends to rotate the trigger member in a clockwise direction as shown in FIGURE 1. The distance between edge **28** and the pivot point **27** forms a moment arm which multiplies the force with which the trigger member attempts to stay in the anchored position.

As stated above, the clip may be attached to an opening in the walls, floors or ceiling of the cargo vehicle. As shown in FIGURE 3 the clip is attached to a rail **28** having openings **29** therein and catch faces **31** on opposite sides of the back portion **32** of the rail. The rail preferably has a shape having legs **33** and **34** for attachment to the wall **35**, offset legs **36** and **37** and a face **38** in which the openings are made. The stem of the L-shaped portion has a width substantially equal to but less than the greatest dimension of the opening.

The biasing means here consists of a spring member having an arm **39** distended between the strap plate and the trigger member and having an end **41** connecting the trigger member and an end **42** connecting the strap plate member. In the clip shown in the drawings, an opening **43** is provided in the clip plate to contain the coils of the spring and an opening **44** holds end **42** and slotted opening **45** holds end **41** so that it may slide as the trigger member is moved.

The operation of the strap clip is as follows: in attaching the clip to the shoring rail, the strap is grasped in one hand and the trigger member is rotated by a finger in a counterclockwise direction against the bias of the spring. The J-shaped member is also rotated so that the distal end is retracted to or below the upper side **46** of the stem of the L-shaped portion. The entire clip is then rotated in a counterclockwise direction from the position shown in FIGURE 1 to the position shown in FIGURE 4. The distal end of the L-shaped portion of the strap clip is inserted into the opening and as the L-shaped portion enters the opening, the entire device is rotated in a counterclockwise direction to the position shown in FIGURE 5. When the L-shaped portion is fully inserted, edge **47** is in contact with side **31** of the rail and edge **48** is in contact with the edge of the opening. The trigger member is then released and the J-shaped portion rotates clockwise to the position shown in FIGURE 6. In this position, edge **49** is in contact with the edge of the opening and edge **28** is in contact with the rear side of the rail. The clip will remain in engagement with the opening in the rail regardless of tension or lack of tension on the strap, but as set forth above, the clamping force of the clip in the opening increases with increased tension on the strap.

In the above construction, it should be noted that the spring acts to maintain the edges of the stems of the L and J-shaped portions in contact with the edge of the opening in the rail to prevent vibrations being set up between the clip and the rail due to loose fittings. Further, the relation of the J-shaped portion to the shoring rail permits the clip to be released from the rail even though there is tension on the strap. To release, the trigger is rotated in a counterclockwise direction as shown in FIGURE 5. Edge **28** sides along the rear edge of the rail. By bearing down on the strap, the clip may be rotated in a clockwise direction as shown in FIGURE 4 and the tension on the clip will cause the L-shaped portion to slip out of the opening in the rail.

I claim:

1. A strap clip for engaging a rail having a relatively small opening therethrough comprising:

(a) a strap plate having an opening at one end for receiving an elongated load holding member, and formed with a single first L-shaped portion projecting from the opposite end;

(b) an elongated trigger member extending transversely across said strap plate and pivotally connected to said strap plate, having a finger engageable portion for locking said strap plate in said opening by limiting rotational movement, said member having a second L-shaped portion projecting from one elongated edge and the stems of said L-shaped portions extending generally in the same direction and being in side to side relation and the distal ends extending in opposite directions; and

(c) means biasing said distal portions in opposite directions so as to bring said stems of said L-shaped portions into engagement with the sides of said rail opening thereby preventing vibration noise and initially preventing reverse rotation, the biasing means also urging said elongated edge toward the distal end of said first L-shaped portion, and the loading member being adapted to be secured to said strap plate only.

2. A strap as described in claim **1** including:

(a) stop means limiting the pivotal swing of said trigger member; and

(b) the stem of said first L-shaped portion having a width substantially equal to but less than the greatest lateral dimension of said rail opening for projecting through said opening.

3. A strap clip as described in claim **1** wherein said pivot is offset from said protruding portion of said trigger member in the direction of said distal portion to provide increased locking moment for increased load upon said strap plate and fail safe operation upon failure of said biasing means.

4. A strap clip as described in claim **2** wherein said stop means consists of offsetting said distal end of said first L-shaped portion sufficiently to catch said trigger member.

5. A strap clip as described in claim **1** comprising:

(a) a rail having an opening therein and catch faces on opposite sides of the back portion of said rail, and

(b) said opening in said strap plate having a width substantially greater than the greatest dimension of said opening in said rail.

6. A strap clip as described in claim **4** wherein:

(a) said trigger member is spaced from said strap plate;

(b) said biasing means consists of a spring member having an arm distended between said strap plate and said trigger member and having an end connecting said trigger member and an end connecting said strap plate member; and

(c) said finger engageable portion being offset towards said strap plate so as to engage the distal portion of said first L-shaped portion.

7. A strap clip as described in claim **1** wherein:

(a) the stems of said L-shaped portions have a length substantially greater than the thickness of said rail opening.

8. A strap clip as described in claim **1** wherein

(a) the combined width of said first stem and the length of the distal end of said first L-shaped portion exceeds the greatest lateral dimension of said rail opening.

References Cited

UNITED STATES PATENTS

3,323,186	6/1967	Rennert.
357,944	2/1887	Stout.
1,830,059	11/1931	Hoffman.

FOREIGN PATENTS

937,816	9/1963	Great Britain.
1,078,799	3/1960	Germany.

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