

[54] **CAP LOCKING DEVICE FOR PNEUMATIC HOPPER OUTLETS**

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[51] Int. Cl.B65d 45/00

[58] Field of Search220/55 R, 38

[56] **References Cited**

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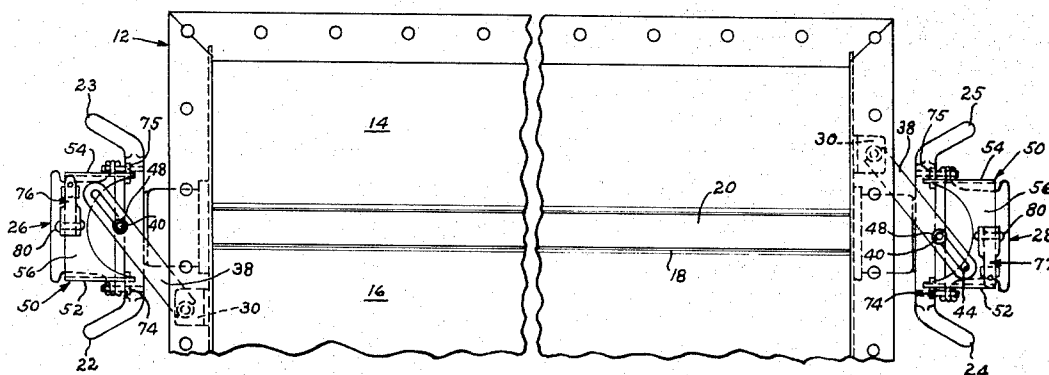
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[57] **ABSTRACT**

Mechanism for locking an end cap on each end of the rotary lading discharge tube of a pneumatic hopper outlet of a railway car includes a bail pivoted to the end cap on a transverse axis, and having arms extending inwardly from the pivots and provided with catches for engaging lugs fixed to the rotary tube. The outermost portion of the pivoted bail has a transversely extending lever mounted thereon provided with camming lugs adapted to bear against the top of the end cap. When the camming lever is turned down, the bail is held tightly against the end cap with the catches at the other end thereof forcefully pressed against the lugs on the rotary tube. Thus the end cap is securely latched to the rotary tube. Simply raising the camming lever permits the bail to be unlatched to ready the end cap for removal.

6 Claims, 7 Drawing Figures



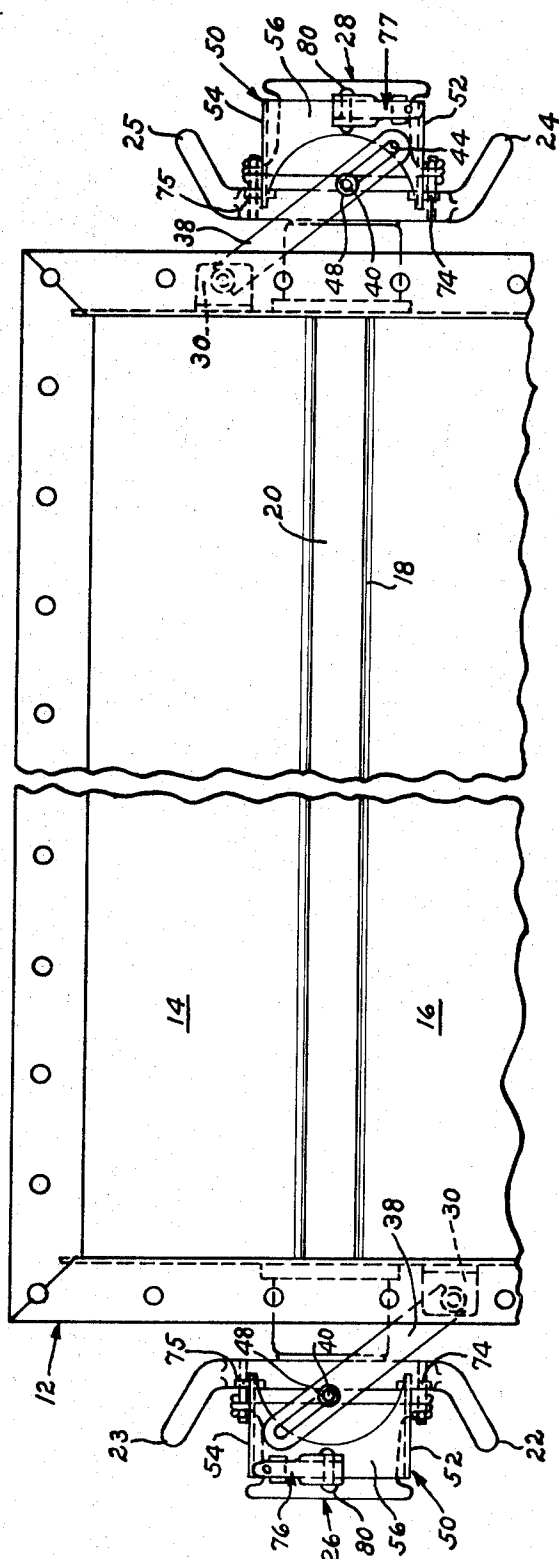


FIG. 1.

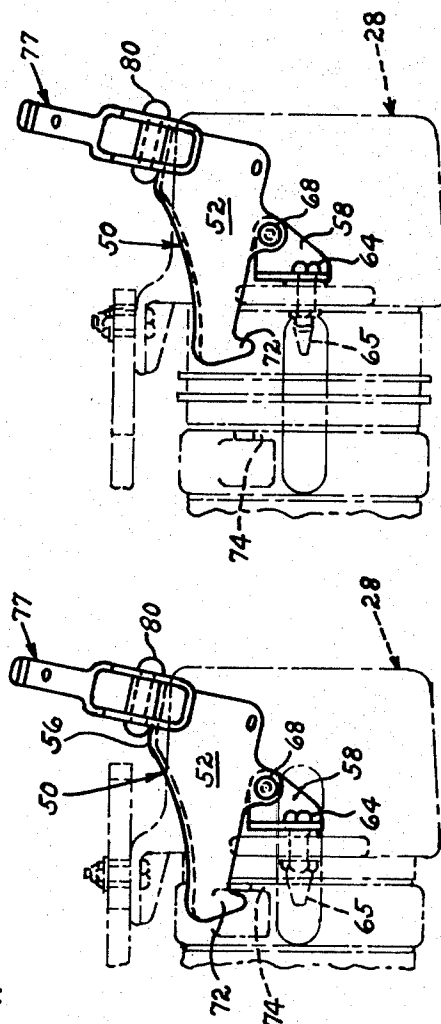


FIG. 6.

FIG. 7.

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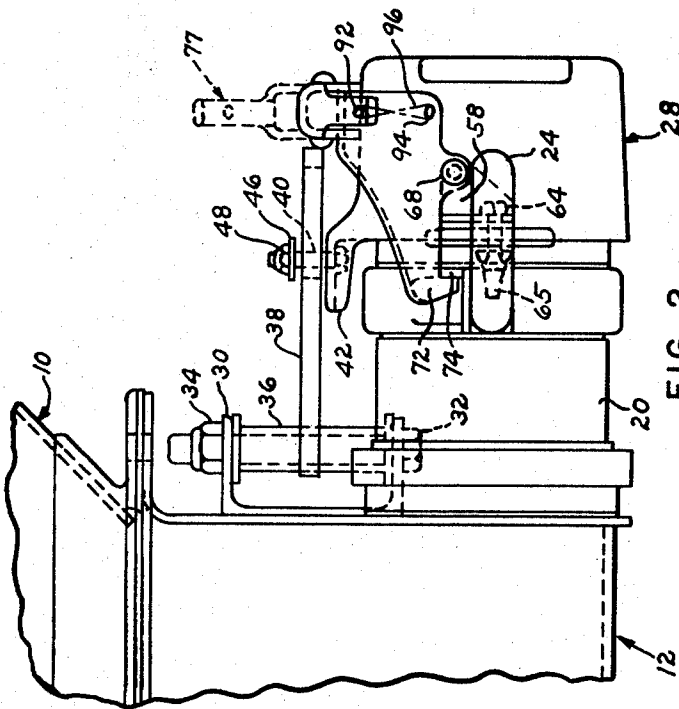


FIG. 2.

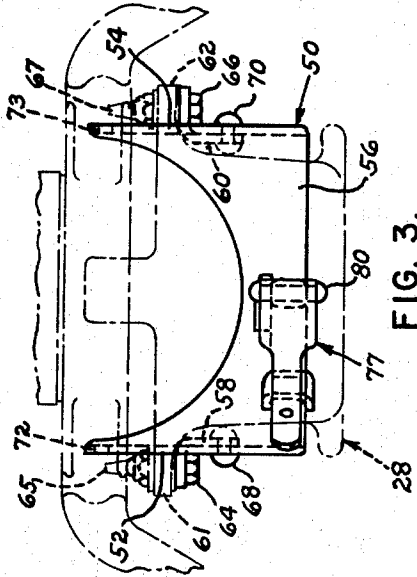


FIG. 3.

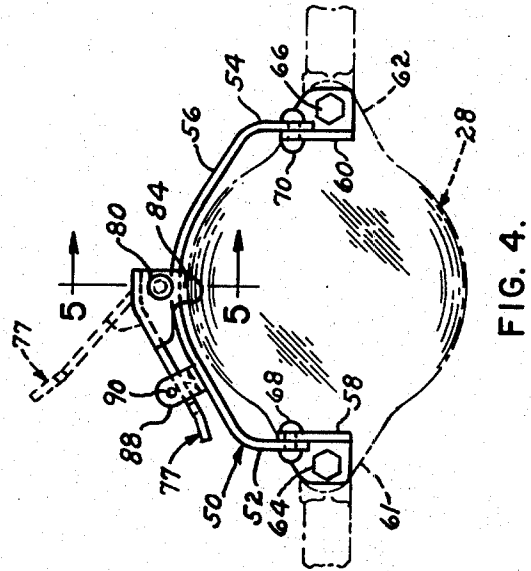


FIG. 4.

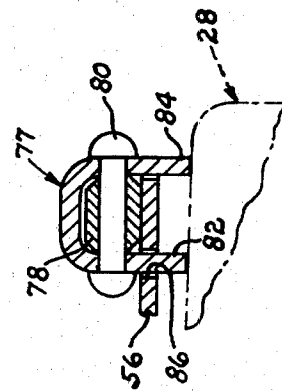


FIG. 5.

CAP LOCKING DEVICE FOR PNEUMATIC HOPPER OUTLETS

BACKGROUND OF THE INVENTION

End caps have been positioned over the ends of rotary discharge tubes in pneumatic outlets heretofore and various means have been provided to hold the end cap in closed position on the end of the tube. It is necessary that such securing means for the end caps be releasable so that the end cap may be removed from the end of the rotary tube when the unloading operation is commenced. For example, U.S. Pat. No. 3,572,844, issued Mar. 30, 1971, shows a bail carried by a fixed housing and has to be pivoted upwardly to a position remote from the end cap in order to allow the end cap to be removed. Such a bail remains on the housing during the unloading operation. In locked position, the bail fits about the outer end of the end cap and projects outwardly therefrom thereby requiring increased space beyond the outward projection of the end cap.

BRIEF DESCRIPTION OF THE INVENTION

The locking device for the end cap of a pneumatic outlet in the present invention comprises a bail which is mounted on and carried by the end cap. The bail fits over the upper surface of the end cap and a cam lock for securing the end cap engages the upper surface of the end cap with the bail being releasably secured to the handles for rotating the tube. Upon removal of the end cap from the end of the rotary tube the bail is removed also since the bail is carried by the end cap. As the bail does not fit over the end of the end cap, no additional space outwardly from the end of the end cap is required.

The invention accordingly comprises the constructions hereinafter described, the scope of the invention being indicated in the following claims.

In the accompanying drawings in which one of various possible embodiments of the invention is illustrated,

FIG. 1 is a top plan of a pneumatic outlet having a rotary tube employing the present invention thereon;

FIG. 2 is an enlarged side elevation of the end portion of the pneumatic outlet in FIG. 1 and showing the cap locking device comprising the present invention in a locked position;

FIG. 3 is an enlarged top plan of the cap locking device shown in FIG. 2 with the end cap and adjacent structure shown in broken lines;

FIG. 4 is an end elevation of the cap locking device shown in FIG. 3;

FIG. 5 is a section taken generally along line 5—5 of FIG. 4;

FIG. 6 is a side elevation of the cap locking device of FIGS. 3 and 4 with the device in an unlocked position; and

FIG. 7 is a side elevation similar to FIG. 6 but showing the cap with the locking device thereon moved outwardly from the end of the rotary tube.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, the invention relates to a hopper 10 having a pneumatic outlet generally in-

dicated 12, commonly used in railway covered hopper cars, and having a construction generally similar to pneumatic outlets disclosed in prior United States patents, such as U.S. Pat. No. 3,215,473. Outlet 12 has sloping sides 14, 16 which converge to an elongated opening 18. The bottom of the outlet is provided with a slotted rotatable tube 20, which forms a valve. When the tube is rotated so that its slot is upward, it receives lading from the hopper; but when the slot is downward, lading cannot enter tube 20. Tube 20 extends transversely across the car and has handles 22, 23 and 24, 25 at opposite ends for rotating the tube to its open and closed positions. Tube 20 is adapted to be closed at both ends by removable end caps 26 and 28, which are identical, and therefore only one of them is herein shown and described in detail.

A support for each end cap includes bracket 30 welded to a side of outlet 12. Bolt 32 and stop nut 34 hold sleeve 36 rotatably on bracket 30. Slotted bar 38 is welded to sleeve 36. Bolt 40 extends through projection 42 of end cap 28 and through slot 44, washer 46, and stop nut 48 for fastening end cap 28 to bar 38.

The structure described so far is prior art. The locking mechanism shown in heavy lines in FIGS. 3 to 7 constitutes the present invention. A member generally indicated 50 in the form of a bail or saddle has side arms 52 and 54 and a connecting portion 56. Brackets 58 and 60 are mounted on projections 61, 62 of end cap 28 by bolts 64, 66. Member 50 is pivoted to brackets 58 and 60 by rivets 68 and 70. The inner end of each arm 52, 54 has a catch 72, 73 adapted to engage a lug or ledge 74, 75 on handles 24 and 25, as shown in FIG. 2. Camming levers 76 and 77 are mounted on the upper outer parts of connecting portions 56. Lug 78 is welded to each portion 56 and pin 80 forms a pivot for the associated lever 77. Lever 77 has a pair of camming lugs 82, 84 adapted to press against the top of cap 28 and move portion 56 upward when lever 77 is moved downward to the position shown in FIG. 4. Lug 82 extends through slot 86 in portion 56. Bracket 88 has holes 90 for receiving a padlock to hold lever 77 in its locked position. Holes 92 and 94 may be provided in lever 77 and portion 56 for receiving a sealed wire 96 holding lever 77 in locked position as shown in FIG. 2.

Bolts 64 and 66 have tapered ends 65, 67 extending into bores in handles 24, 25. This insures that the handles are centered so that rotatable tube 20 is in its completely closed position.

The operation of the apparatus will now be described: In transit, tube 20 is adjusted to its closed position with handles 22 to 25 horizontal, and end caps 26 and 28 mounted on the ends of tube 20 and levers 76, 77 are down, as shown in FIGS. 1 to 5. When the car reaches its destination, where it is to be unloaded, it may be desired first to take a sample of the lading. This may be done by removal of a cap 28 from one side of the car. Then handles 22 and 23, or handles 24 and 25, can be turned a slight amount in a clockwise direction until bar 38 binds against washer 46 on the other side of the car thereby to rotate tube 20 slightly so that a small amount of lading falls through slot 18 into tube 20. The lading in tube 20 may be removed to provide a sample of the lading.

When hopper 10 is to be unloaded, sealed wire 96 is removed and lever 77 is raised to the dashed line position shown in FIG. 4. Camming lugs 82, 84 are thereby removed from the end caps and locking member 50 can be turned clockwise to the position shown in FIG. 6 to bring catch 72 out of engagement with lug 74. End cap 28 can then be slid off the end of rotatable tube 20, as indicated in FIG. 7, and can be swung to one side while remaining supported, but captive, on slotted bar 38. End cap 26 may be removed in the same manner. Handles 22, 23 or 24, 25 are then turned to bring the opening of tube 20 into registry with slot 18 of outlet 12. A vacuum hose is then attached to one end of tube 20 to remove the lading falling into it from hopper 10. The reverse series of steps required to mount and lock the end caps in place is obvious.

What is claimed is:

1. A closure for the rotatable tube of a pneumatic outlet of a railway car hopper; comprising an end cap adapted to fit on the end of said tube; a locking member spanning the cap, said locking member having a pair of arms extending along opposite sides of said cap and a portion interconnecting said arms, said arms being pivotally mounted intermediate their length on said opposite sides of the cap; a catch on the inner end of each arm adapted to engage a lug fixed on either side of said rotatable tube when said locking member is pivoted toward the rotatable tube; and camming means mounted at the outer end of the locking member on the connecting portion thereof for camming the locking member against the cap for securing said locking member in its locking position.

2. A closure according to claim 1, wherein said

camming means includes a lever pivoted on an axis parallel to the axis of the rotatable tube and having a cam portion adapted to engage the cap.

3. A closure according to claim 2, wherein a pair of diametrically opposed handles are affixed to said rotatable tube and the lugs are integral with said handles.

4. A closure according to claim 3, wherein each handle has a bore parallel to the axis of the rotatable tube and said cap has a pair of bolts positioned to enter the bores when the cap is in closed position, whereby the handles are locked to the cap against rotation.

5. A closure according to claim 4, including means for supporting said rotatable tube on the outlet, said supporting means being adjustable to permit limited rotation of the rotatable tube by said handles when said cap is locked to the rotatable tube.

6. An arrangement for closing a lading discharge tube of a pneumatic hopper outlet; comprising a generally cylindrical cap adapted to fit over and close one end of said discharge tube; a pair of lugs fixed to opposite sides of said discharge tube; a bail mounted on pivots on opposite sides of said cap, said bail having a portion extending outwardly of the pivots thereof; and a pair of arms extending inwardly from the pivots along opposite sides of said cap, said arms having catches on the ends thereof which are adapted to engage said lugs for holding said cap on the tube; and camming means on said bail outwardly of the pivots adapted to cam against said cap to hold said catches locked against said lugs.

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