July 6, 1948. W. F. ECKERT 2,444,432

TWO-WAY ROLLER GUIDE

Filed Jan. 15, 1945

Fig. 1

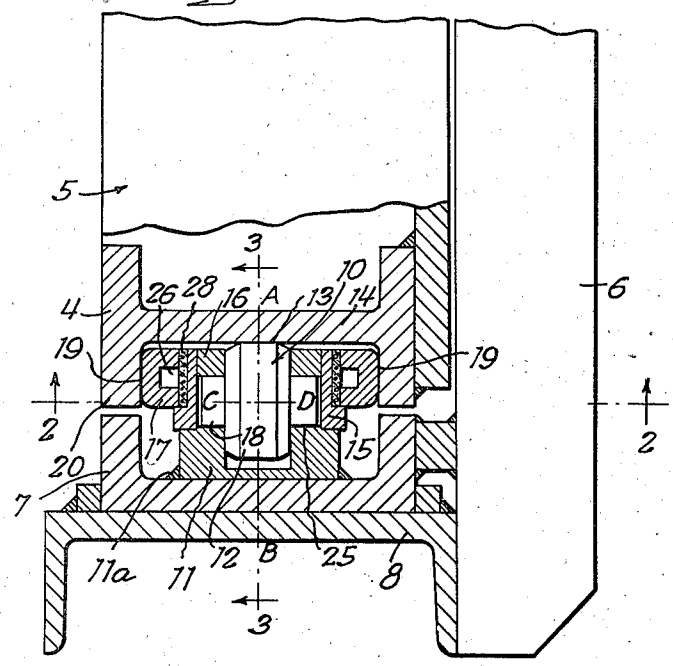


Fig. 2

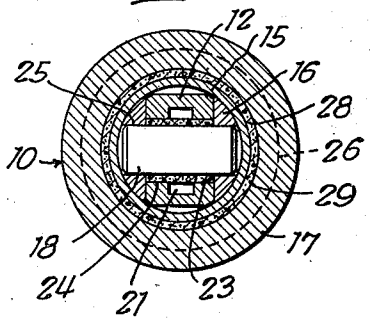
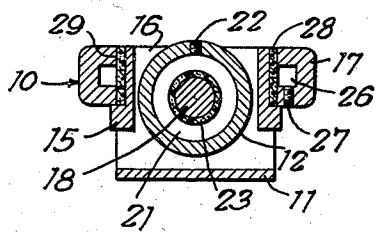


Fig. 3



Inventor
William F. Eckert
Andrew F. Winterrowd
atty.

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TWO-WAY ROLLER GUIDE

William F. Eckert, Rochelle, Ill.

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6 Claims. (Cl. 308—6)

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This invention relates to a new and improved two-way roller guide.

In many kinds of machines and devices the conditions of operation are such that an ordinary roller guide adapted to assume loads in only one direction are not satisfactory. That is true, for example, in hydraulic lift trucks such as have been used in the transportation of gasoline, ammunition and matériel generally in landing operations during the present war. In these trucks a lift is provided on the front end of heavy duty design requiring the best obtainable two-way anti-friction rolling action, because in addition to heavy thrusts in a fore and aft direction there are also frequently very heavy lateral thrusts. Heretofore, two-way rolling action in this type of vehicle was obtained with rollers mounted in close proximity and on axes at right angles to one another. It is the principal object of my invention to provide a more compact and more efficient two-way roller guide having one roller working inside the other.

The invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a horizontal sectional view through a portion of the lift structure of a hydraulic lift truck of the kind previously mentioned, illustrating a two-way roller guide made in accordance with my invention, and

Figs. 2 and 3 are sections in planes at right angles to one another on the lines 2—2 and 3—3 of Fig. 1, respectively.

The same reference numerals are applied to corresponding parts in these views.

The reference numeral 4 designates an I-beam guide member forming a part of the framework of the lift, indicated generally by the reference numeral 5, provided on the front end of a hydraulic lift truck, of which the cross member 6 forms a front end part. The channel beam 7 disposed alongside and parallel to the I-beam 4 and supported on the larger channel beam 8 on the front of the truck frame constitutes a cooperating stationary guide member. The two-way roller guide of my invention is indicated generally by the reference numeral 10 and comprises a forked support 11 for the inner roller 12 which is arranged to run on the track surface 13 afforded on the web 14 of the I-beam 4. The fork 11 is indicated at 11a as welded to the web of the channel beam 7, but it may, of course, be fastened in any other suitable manner. A collar 15 surrounds the reduced cylindrical portion 16 of the fork 11 and provides a bearing externally thereof for the outer roller 17 on an axis A—B at right

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angles to the axis C—D, defined by the pin 18, on which the inner roller 12 operates. In other words, the smaller inner roller 12 operates inside the larger outer roller 17 on an axis C—D at right angles to the axis A—B on which the outer roller 17 operates. The outer roller 17 runs on the opposed track surfaces 19 provided on the inner sides of the flanges 20 of the I-beam 4.

With this compact arrangement of the two rollers, one inside the other, the most efficient two-way rolling action is obtained. The major thrusts come in a fore and aft direction and are assumed by the larger outer roller 17. The smaller inner roller 12 assumes the lateral thrusts.

The inner roller 12 is cored out to provide an annular chamber 21 therein for lubricant which can be supplied upon removal of the screw threaded plug 22 threaded in a radial hole from the outer periphery of the roller 12. An oilite bearing bushing 23 has a press fit in the center hole 24 in the roller 12 and absorbs lubricant from the chamber 21 for easy running of the roller 12 on the pin 18. The pin 18 has a working fit in the bushing 23 and a press fit in the registering holes 25 provided in the fork 11 and is held against accidental endwise displacement by the collar 15. In that way, years of satisfactory operation with an initial lubrication are assured. In like manner, the outer roller 17 is cored out to provide an annular chamber 26 therein for lubricant, and the lubricant may be supplied to this chamber upon removal of a screw threaded plug 27 from a hole drilled into the side of the roller. An oilite bearing bushing 28 which has a press fit in the center hole 29 in the roller 17 absorbs lubricant from the chamber 26 and thereby assures the easy turning of the roller 17 on the collar 15 for a definite length of time on the initial lubrication. This feature is of particular importance in the present application of the invention and wherever the two-way roller guide may be used in difficult-to-get-at places, or where it may mean the necessity for disassembling a sizeable portion of the machine or device in order to effect lubrication of the two-way roller guide.

While I have shown the two-way roller guide assembly mounted on the stationary guide member for cooperation with the movable guide member, it should, of course, be understood that in certain cases this arrangement may be reversed and no limitation should, therefore, be regarded as placed upon the use of my invention by reason of this disclosure.

It is believed the foregoing description conveys

a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A device of the character described, comprising a forked support, a smaller inner roller rotatably mounted in said support on one axis extending in a predetermined direction with respect to said support, said inner roller projecting from said support and adapted to run on a guide track surface extending in a predetermined plane relative to said support, and a larger outer roller encircling said inner roller and rotatably mounted on said support to turn on an axis in transverse relation to the first mentioned axis and adapted to run on a guide track surface or surfaces in a plane or planes in transverse relation to the aforesaid plane.

2. A two-way roller guide for an elevator truck, comprising, in combination, two guide members which are movable longitudinally relative to one another, the one guide member having a channel therein providing roller track surfaces on the opposed parallel faces and on the transverse face, a forked support mounted on the other guide member, a smaller inner roller rotatably mounted in said support for rotation on an axis substantially parallel to the track surface on the transverse face of said channel and projecting from said support to run on said track surface for assumption of lateral thrusts, and a larger outer roller encircling the inner roller and rotatably mounted on said support on an axis substantially at right angles to the first axis and arranged to run on the opposed track surfaces in said channel for assumption of thrusts in a fore and aft direction.

3. A two-way roller guide, comprising, in combination, two guide members which are movable longitudinally relative to one another, the one guide member having a channel therein on the side thereof toward the other guide member providing roller track surfaces in planes substantially at right angles to one another, a forked support on said other guide member, a smaller inner roller mounted in said support to turn on an axis substantially parallel to the base of the channel and projecting from said support to run on the track surface on said base, and a larger outer roller encircling said inner roller and rotatably mounted on said support to turn on an axis substantially at right angles to the first axis and arranged to run on the opposed track surfaces on the sides of said channel.

4. A two-way roller guide assembly, comprising a forked support carrying a cross-pin, a smaller inner roller rotatably mounted in said support on said cross-pin to turn on an axis extending in a predetermined direction relative to said support, said roller projecting from said support for engagement with one of two or three track surfaces in planes at right angles to one another, and a larger outer roller encircling said inner roller and rotatably mounted on said support to turn on an axis in transverse relation to the first axis and adapted to run on the other track surface or surfaces, said cross-pin extending substantially in diametrical relation to and within said outer roller and retained at its ends against endwise displacement from said fork.

5. A two-way roller guide assembly comprising, in combination, a forked support, a cross pin in the fork thereof, a smaller inner roller rotatably mounted on said cross pin, said fork having an externally cylindrical portion, a bearing collar mounted thereon which retains said cross pin against endwise displacement from the fork, and a larger outer roller encircling the inner roller and rotatably mounted on said collar.

6. A two-way roller guide comprising, in combination, two guide members which are movable longitudinally relative to one another, one guide member having a channel therein providing roller track surfaces in transverse planes, a forked support on said other guide member, a smaller inner roller mounted in said support to turn on an axis substantially parallel to the base of the channel and projecting from said support to run on the track surface on said base, and a larger outer roller encircling said inner roller and disposed in the plane thereof and rotatably mounted on said support to turn on an axis in transverse relation to the first axis and arranged to run on the opposed track surfaces on the sides of said channel.

WILLIAM F. ECKERT.

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