United States Patent [19]

Dalton

[11] **3,923,164**

[45] **Dec. 2, 1975**

[54] **DRAWHEAD LEVELING DEVICE**

[76] Inventor: **Everett L. Dalton,** 2205 Jefferson St., Logansport, Ind. 46947

[22] Filed: **Feb. 3, 1975**

[21] Appl. No.: **546,682**

[52] **U.S. Cl.** ..... **213/75 R;** 213/153

[51] **Int. Cl.²** **B61G 3/00**

[58] **Field of Search** ..... 213/19, 20, 21, 75 R, 109, 213/153

[56] **References Cited**

UNITED STATES PATENTS

545,862	9/1895	Scurr et al	213/153 R
3,698,571	10/1972	Hawthorne	213/153

Primary Examiner—Stanley H. Tollberg
Assistant Examiner—Larry H. Martin

[57] **ABSTRACT**

Apparatus for maintaining horizontal alignment between coupled drawheads used in coupling rail cars. Each drawhead has an arcuate knuckle which is adapted to engage a complementary arcuate knuckle of a second drawhead, each drawhead being attached to a respective rail car. Upright bores are formed in each coupled knuckle. A U-shaped leveler member has a horizontal foot and two upstanding elongated posts of unequal length connected thereto. The posts are horizontally movable relative one another and are insertable in the lower ends of the upright bores. The longer post vertically extends above its respective knuckle and threadedly engages a fastening member which is tightened on the post with a wrench or similar tool to vertically adjust the drawheads until they are in horizontal alignment.

9 Claims, 6 Drawing Figures

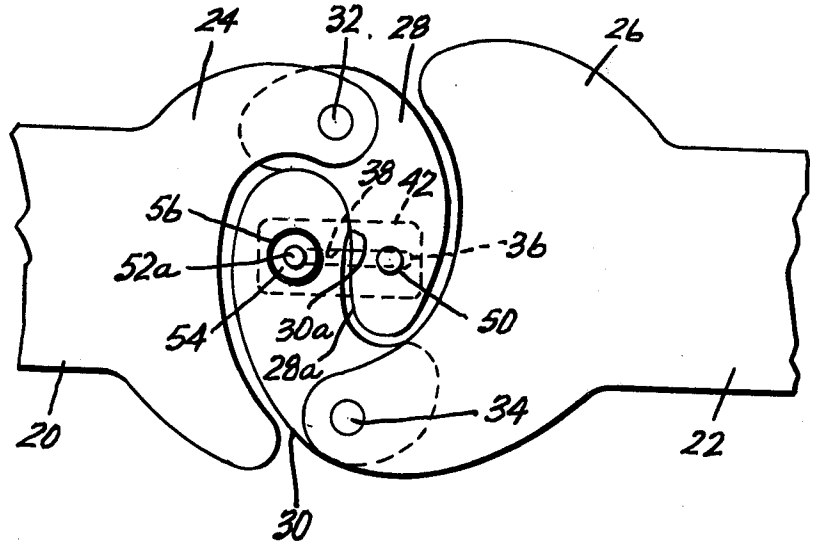


FIG.1

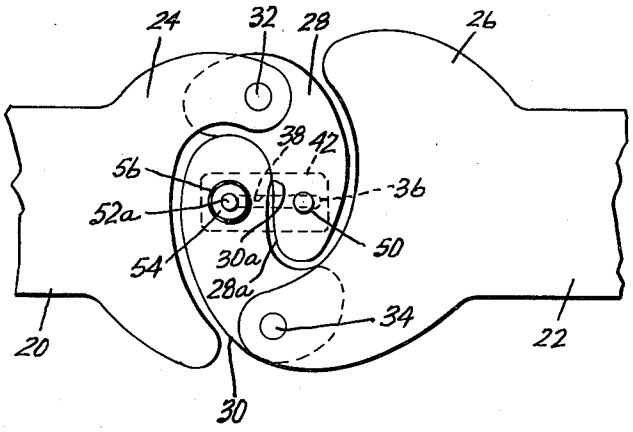


FIG.2

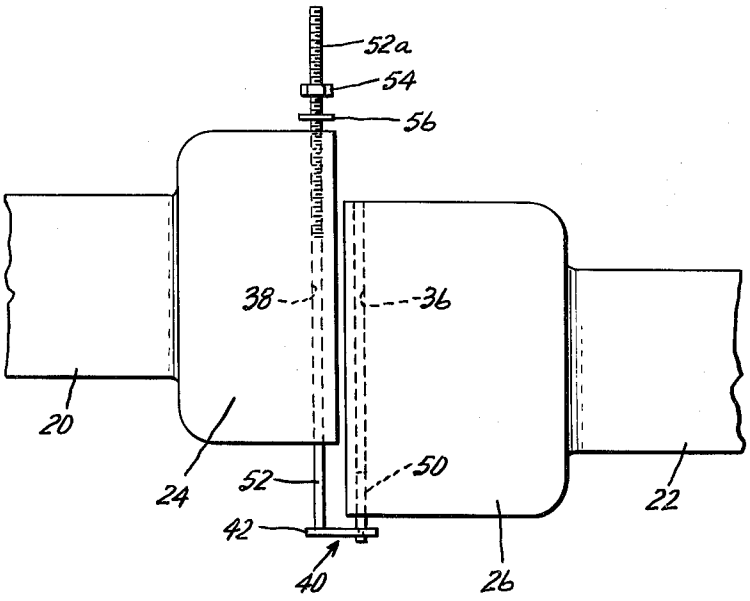


FIG.3

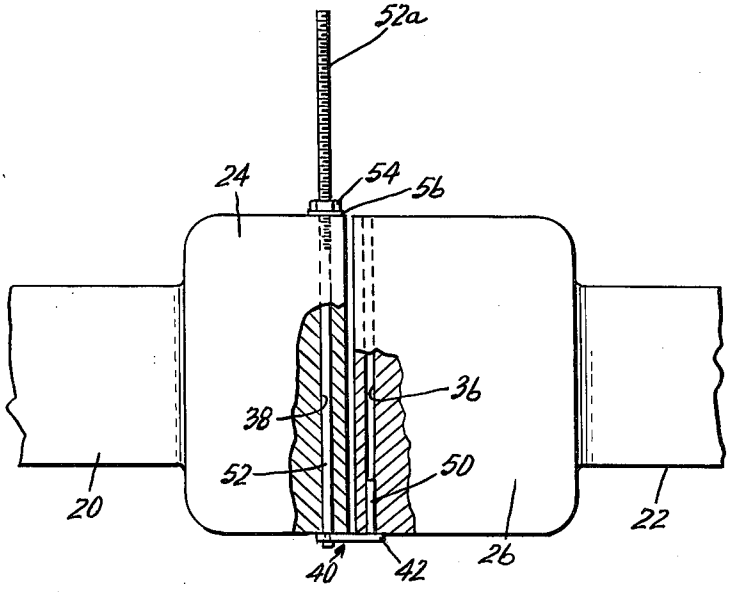


FIG. 4

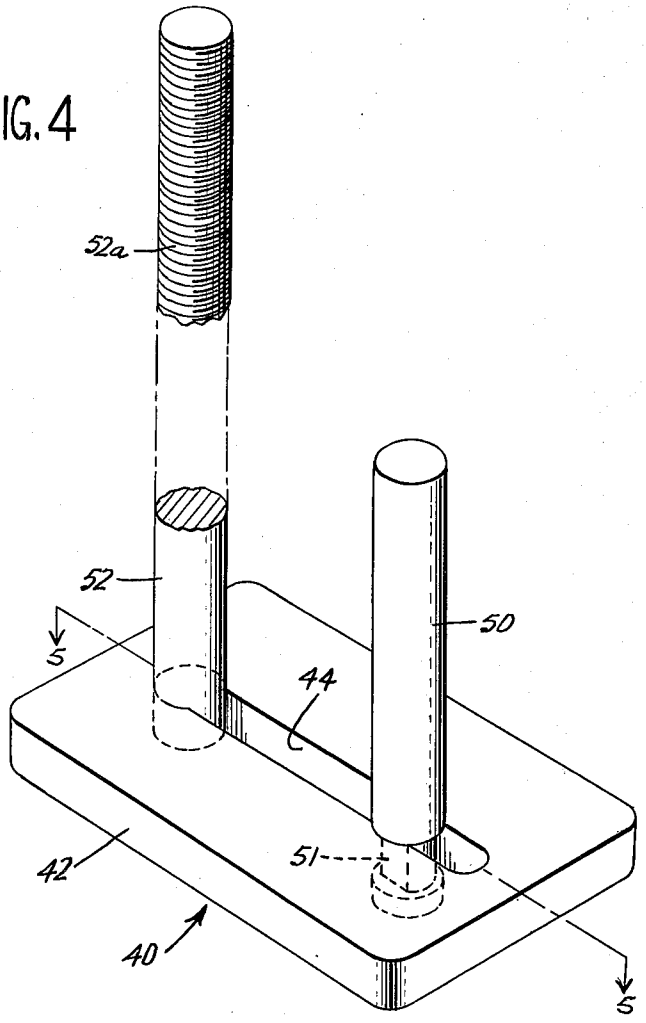


FIG. 6

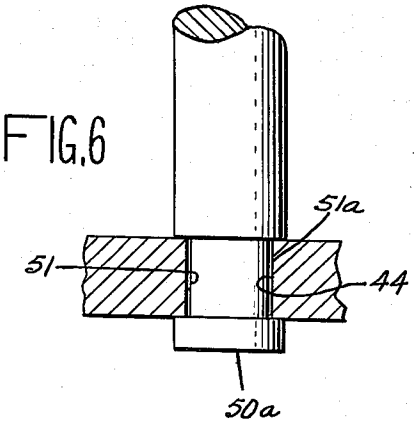
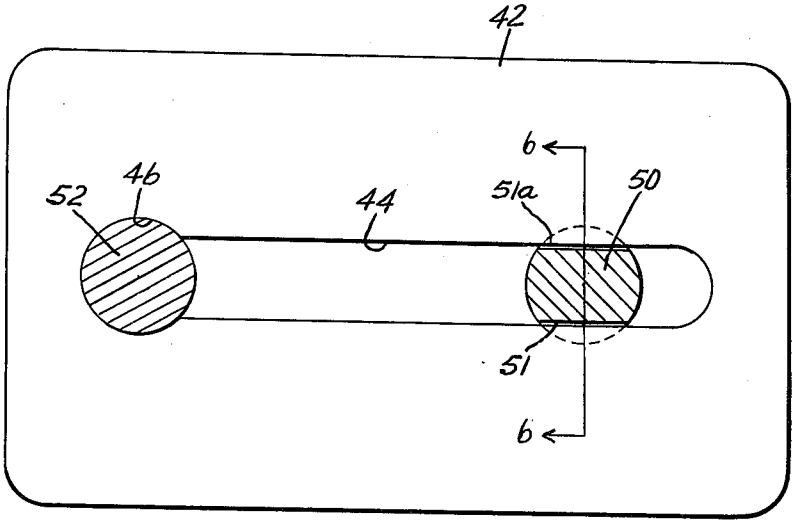


FIG. 5



DRAWHEAD LEVELING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention is in the field of drawheads used for coupling rail cars.

2. Description of the Prior Art

Railroad cars have coupling members which are connected to and extend from either end of a car and are adapted to mate with a similar coupling member of the rail cars immediately adjacent thereto. These coupling members generally comprise drawbars having drawheads formed at the distal ends thereof. Each drawhead has an arcuate knuckle for engagement and coupling with a knuckle from a complementary drawhead connected to an adjacent car. A large number of drawheads which are still in use today have no provision for restraining relative vertical movement between the coupled knuckles. Under ordinary circumstances, there is no need for such vertical restraint. However, over years of use, the drawheads and drawbars are subject to wear and damage and horizontal misalignment occurs. The resultant relative vertical movement between the drawheads increases the pressure on the contacting portions between the drawheads since, as misalignment occurs, smaller and smaller surface contacts between the drawheads are subjected to the same pulling force between the cars. This increase in pressure frequently causes the drawheads to become irreparably deformed or broken and substantial expense is incurred in replacing the drawheads and drawbars. Also derailment may occur if broken portions of drawbars and drawheads should fall on the track surface. Hence, there arises a need for horizontally aligning or "leveling" the drawheads.

Efforts to solve this problem have entailed relatively major modifications of one or both drawheads with corresponding major expense. This invention provides a relatively simple, inexpensive modification to drawhead construction, for both original equipment and existing equipment, to accomplish the required drawhead leveling.

SUMMARY OF THE INVENTION

This invention provides a relatively inexpensive and simple modification to drawhead construction to provide for leveling and maintaining horizontal alignment between drawheads of adjacent rail cars. Upright bores are formed in the knuckle portion of each drawhead, this being the only modification to the drawhead proper required. A U-shaped leveler member having a horizontal foot and two upstanding posts of unequal lengths connected thereto is positioned below the knuckles of the coupled drawheads so that the posts are aligned with the bores. The posts are inserted in the bores so that the longer post extends above the higher of the misaligned knuckles. A fastener threadedly engages the post so exposed and is threaded on the post to vertically adjust and hold the two knuckles. Tightening of the threaded member on the longer post will raise the foot which in turn raises the lower knuckle until the knuckles are in horizontal alignment. This alignment will be maintained until the leveler member is removed and the drawheads can be repaired.

The foot member has a horizontal slot in which the shorter post member travels to provide a relative horizontal adjustment between the posts. This is desirable and necessary since the knuckles undergo relative horizontal movement during acceleration and deceleration of the rolling stock. The elongated slot has a width dimension which is smaller than the diameter of the posts. The shorter post has two chordal flats formed on opposite sides of the post near the lower post end which provides for horizontal movement in the foot but prevents vertical movement relative thereto. The longer post is welded to the foot.

Once a coupling of misaligned drawheads is detected, the posts of a U-shaped member are inserted in their respective upright bores of the coupled knuckles with the longer post being in the knuckle of the higher drawhead. A tapped nut is placed on the exposed threaded post end, and is tightened thereon by a wrench or similar tool, until the drawheads are horizontally aligned or leveled. At the earliest available opportunity, the U-shaped member is removed and the drawbars are repaired before serious and permanent damage occurs.

It is therefore an object of this invention to provide a drawhead leveler device that is of simple design and requires a minimum of modification to the drawhead elements.

Another object of this invention is to provide a drawhead leveler of the foregoing object that can be applied to misaligned drawheads by an unskilled worker with a simple hand tool in a relatively short period of time to maintain alignment between the drawheads until they can be repaired.

The above-mentioned and other features and objects of this invention and the manner of attaining them will become more apparent and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of two drawheads in a locking relationship being connected with a leveler of this invention;

FIG. 2 is a side view of a pair of drawheads that are out of horizontal alignment and have a leveler of this invention inserted therein prior to tightening;

FIG. 3 is a side view of the two drawheads of FIG. 2 with the leveler device tightened and the drawheads horizontally aligned;

FIG. 4 is a view in perspective of the U-shaped leveler device of this invention;

FIG. 5 is a sectional view taken at section line 5—5 of FIG. 4; and

FIG. 6 is a partial sectional view taken at section line 6—6 of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 is shown drawbars 20 and 22 having enlarged crescent shaped drawheads 24 and 26 formed at their respective distal ends. The outer ends of the drawbars are attached to rail cars, not shown. Arcuate knuckles 28 and 30 are pivoted at pivots 32 and 34, respectively, to drawheads 24 and 26 and are shown in a coupled and locked postion by mechanism conventional to the art and not shown in the drawings. Each knuckle 28 and 30 has an inner substantially vertical surface 28a and 30a, respectively, facing its respective drawbar 20 and 22, respectively. Surfaces 28a and 30a provide the force transfer surfaces between the draw-

heads 24 and 26. Knuckles 28 and 30 have upright bores 36 and 38 formed therein, respectively.

A U-shaped leveler member 40 has an elongated plate or foot 42 formed with an elongated slot 44. An enlarged circular opening 46 is at one end of slot 44. A post 50, made of metallic rod stock, has a diameter slightly less than the diameter of opening 46 but greater than the width of slot 44. Formed a short distance from the bottom end 50*a* of post 50 are two opposite chordal flats 51 aand 51*a* which are spaced apart a distance slightly less than the width of slot 44. Post 50 is inserted in opening 46 with the chordal flats aligned with the sides of slot 44 and then the post is moved longitudinally in slot 44 to clear opening 46.

A post 52, which is substantially longer than post 50, is also made of metallic rod stock and has a diameter approximately equal to the diameter of opening 46. One end of post 52 is fitted in opening 46 and welded to foot 42. The other end 52*a* of post 52 is threaded to threadedly engage a tapped hex nut 54 as later described.

When the distal ends of two drawheads 24 and 26 have been detected out of horizontal alignment, as shown in FIG. 2, a leveler member 40 is placed below the drawheads 24 and 26 with posts 50 and 52 being aligned with upright bore openings 36 and 38, respectively. It is important that the longer post member 52 be inserted in the bore of the higher drawhead for reasons that will become apparent. The length of post 52 corresponds to twice the heighth of a drawhead 24 so that it is possible to have a threaded portion of post 52 extend above drawhead 14 even though the drawheads 24, 26 are almost totally out of horizontal alignment.

Referring to FIGS. 2 and 3, posts 50 and 52 are inserted in upright bores 36 and 38, respectively, until foot 42 engages the lower surface of drawhead 26. Then a washer 56 is fitted over the threaded top 52*a* of post 52 and a tapped hex nut 54 is threadedly engaged with post 52. Nut 54 is tightened, as with a wrench, or other similar tool, on post 52 and due to the force of foot 42 against the lower surface of drawhead 26, drawhead 26 is lifted relative drawhead 24 until it becomes horizontally aligned with drawhead 24. At this point the rail cars may be moved to a side track or other repair area where the leveler 40 is removed and the drawheads and drawarms are repaired to horizontally align drawheads 24 and 26.

In order to accomodate various horizontal clearances between upright bores 36 and 38 in the complementary knuckles 28 and 30, which occur during the acceleration and deceleration of the cars and occur due to variations in particular drawhead dimensions, it is necessary that post 50 be movable horizontally relative post 52 while being vertically fixed relative thereto. Since the distance between chordal flats 51 and 51are less than the width of slot 44, post 50 is able to move horizontally in slot 44 to provide for the necessary horizontal movement relative post 52. However, since the diameter of post 50 is greater than the width of slot 44, relative vertical movement between post 50 and post 52 is restricted.

Leveler 40 may be easily removed with a simple tool such as a wrench. Hex nut 54 is loosened on the threaded end 52*a* of post 52 until it is disengaged therefrom. Washer 56 is lifted off of post 52 and leveler 40 may be lowered until post 52 clears upright opening 38. Leveler 40 may then be reused as needed.

Existing drawhead assemblies may be readily adapted to the device of this invention by simply forming knuckles 28, 30 with upright bores 36, 38. New drawbars may be manufactured to receive the leveler device of this invention with practically no additional cost since the upright bores 36 and 38 may be readily machined or otherwise formed while in the manufacturing stage.

While there have been described above the principles of this invention in connection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of the invention.

What is claimed is:

1. Apparatus for maintaining horizontal alignment between complementary drawheads for coupling rail cars comprising

a first drawbar having a first drawhead formed at one end thereof and adapted for connection at the other end thereof to a first rail car,

a second drawbar having a second drawhead formed at one end thereof and adapted for connection at the other end thereof to a second rail car,

said first drawhead having a first arcuate member with a substantially vertical first surface facing the first drawbar, the end of said first arcuate member and the first drawhead defining a substantially vertical opening,

said second drawhead having a second arcuate member with a substantially vertical second surface facing said second drawbar and the end of said second arcuate member defining a substantially vertical opening for receiving said first arcuate member whereby said vertical first and second surfaces become engaged to form a coupling between the first and second drawheads,

said first and second arcuate members each having substantially vertical upright bores formed therein,

a U-shaped leveler member having a substantially horizontal foot and two elongated parallel upstanding posts orthogonally extending from said horizontal foot,

said upstanding posts insertable in the lower ends of the upright bores of said first and second arcuate members,

said upstanding posts being restricted from vertical movement relative said foot and at least one of said posts being horizontally movable relative to said foot, whereby on relative horizontal movement of said drawheads, said posts are horizontally movable relative each other,

and means to vertically adjust and retain at least one of said posts relative to said drawheads whereby said drawheads will be vertically adjustable and supportable relative to one another.

2. Apparatus according to claim 1 with said means comprising a threaded post portion extending vertically above one of said drawheads to threadedly engage a tapped retaining member.

3. Apparatus according to claim 1 with said foot having an opening to receive an end of one of said posts, an elongated slot having a width less than said one post diameter being formed in said foot and connected to said opening.

said one post having chordal flats formed on opposite sides thereof and closely spaced to said one post end, said chordal flats being spaced apart a dis-

tance less than the width of said slot to permit movement of said one post in said slot with relative freedom but to restrain said one post from vertical movement relative to said slot, and

the other of said posts being fixed to said foot in said opening.

4. Apparatus according to claim **2** with said threaded post being substantially longer than the other post.

5. Apparatus for maintaining horizontal alignment between complementary drawheads for coupling rail cars comprising

a U-shaped leveler member having a substantially horizontal foot and two elongated parallel upstanding posts orthogonally extending from said horizontal foot, said upstanding posts being insertable in openings formed in the complementary drawheads,

said upstanding posts being restricted from vertical movement relative said foot and at least one of said posts being horizontally movable relative said foot, whereby on relative movement of the drawheads, said posts are horizontally movable relative one another, and

means to vertically adjust and retain at least one of said posts relative the drawheads whereby the drawheads will be vertically adjustable and supportable relative to one another.

6. Apparatus according to claim **5** with said means comprising a threaded post portion extending vertically above one of said drawheads to threadedly engage a tapped retaining member.

7. Apparatus according to claim **5** with said foot having an enlarged opening to receive an end of one of said posts, an elongated slot having a width less than said one post diameter being formed in said foot and connected to said enlarged opening,

said one post having an area of reduced transverse dimension near said one end, said reduced dimension being less than the width of said slot to permit movement of said one post in said slot with relative freedom but to restrain said one post from vertical movement relative to said slot.

8. Apparatus according to claim **7** with said area of reduced dimension comprising chordal flats formed on opposite sides of said one post, said chordal flats being spaced apart a distance less than the width of said slot.

9. Apparatus according to claim **7** with the other of said posts being fixed to said foot in said enlarged opening.

* * * * *