Jan. 14, 1964 C. R. RADEY ETAL 3,117,677

RAILWAY CAR UNCOUPLING DEVICE

Filed April 17, 1961 2 Sheets-Sheet 1

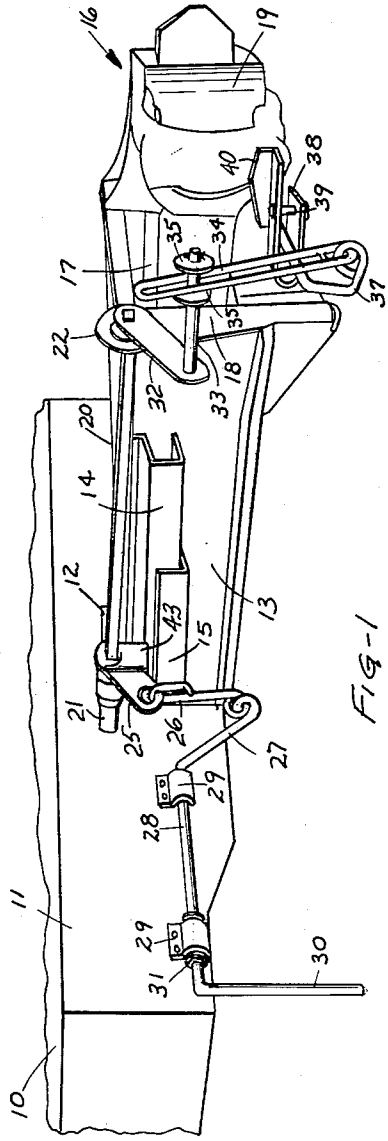


FIG-1

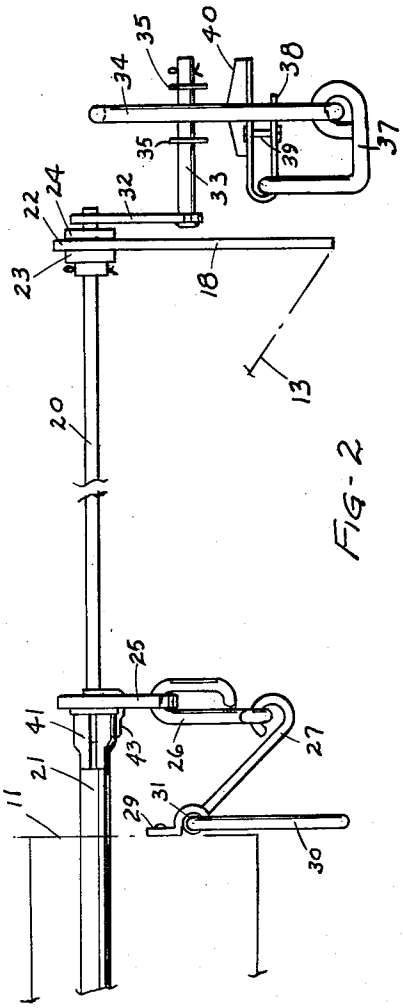


FIG-2

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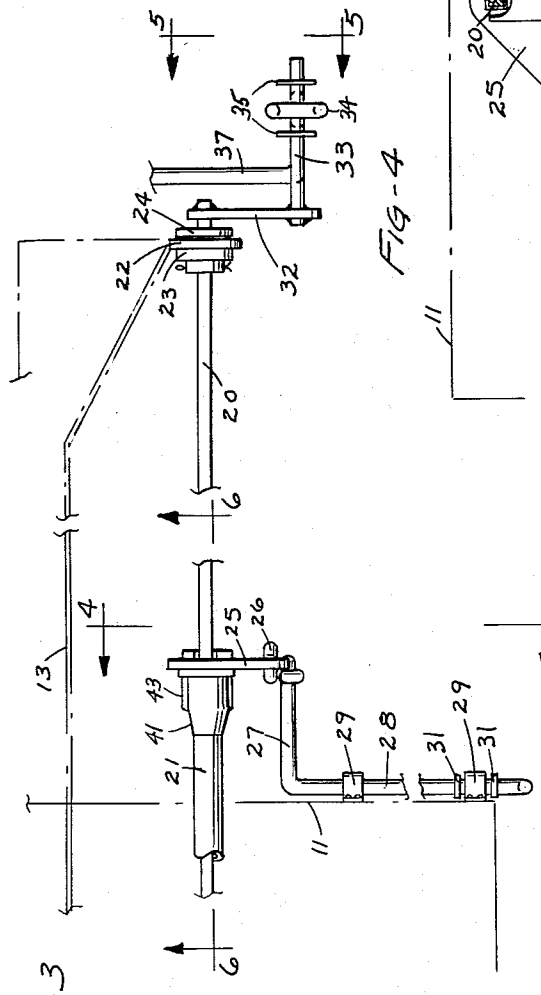


FIG-3

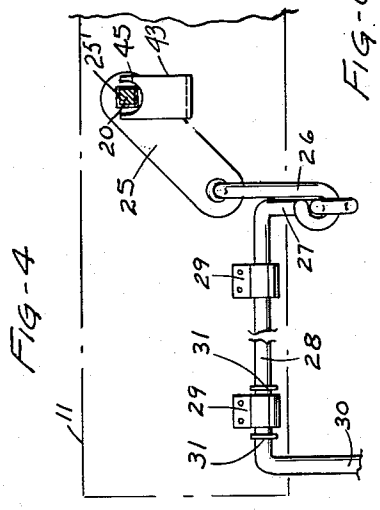


FIG-4

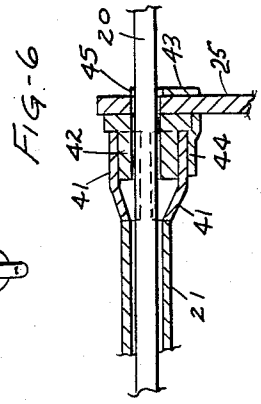


FIG-6

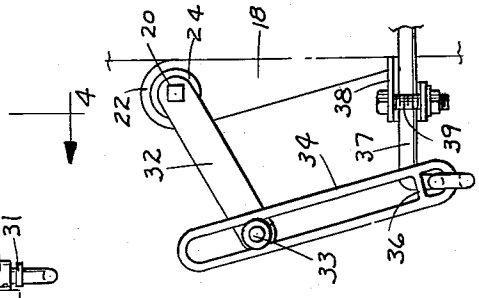


FIG-5

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RAILWAY CAR UNCOUPLING DEVICE

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12 Claims. (Cl. 213—219)

The invention is directed to an uncoupling device for use in a railway car which is provided with a long travel cushioning arrangement of a type disclosed in U.S. Patent 3,003,436. More specifically the invention deals with a special uncoupling device having operating parts designed for maintaining operational engagement with a conventional locking mechanism forming a part of a coupler and controlling actuation of the standard coupling knuckle, the device being designed to accommodate long travel of a cushioned sliding sill relative to the car body, the projecting end of this sill carrying the pivotally mounted coupler therein.

As fully disclosed in the forementioned patent, center sill cushioning is now being used in various types of railway cars, such as flat cars and box cars, to absorb buff and draft forces exerted through the car couplers mounted at the opposite ends of the car. The cushioned sill design basically includes a hollow, longitudinally extending center sill receiving therein a telescopic sliding sill unit which in turn pivotally mounts couplers at its projecting ends. The sills are interconnected through a suitable cushioning device, hydraulically or otherwise appropriately operated, which functions to absorb operational coupler shocks in buff and draft which result in retraction of the sliding sill into the car at one end thereof and extension of the sliding sill at the other end of the car. Thus the couplers and sliding sill mounting means therefor actually move relative to the car longiturinally thereof and the freight carried by the car is protected from destructive operational shocks by such relative movement. The cushioning arrangement provides for automatic return of the coupler mounting sliding sill and the car body itself remains generally unaffected during operational shock absorption.

It is an object of the present invention to provide a new and improved uncoupling device for use with a railway car having a long travel cushioning arrangement of the type described, the uncoupling device being adapted to accommodate telescopic movement of a sliding sill relative to the car body, the various elements of the uncoupling device retaining proper operative association during such telescopic movement and being adapted at all times for uncoupling operation.

Another object is to provide a new and improved uncoupling device particularly adapted for use in a railway car having a long travel cushioning arrangement, the device being adapted for mounting along a sliding sill structure of the long travel cushioning arrangement with parts thereof being movable longitudinally with the sliding sill structure relative to the associated end sill of the car, the device further including operating portions thereof mounted on the end sill and capable of maintaining operative association with the portions mounted on the sliding sill for efficient unlocking of a coupler carried by the sliding sill at all times.

Still another object taken in conjunction with the foregoing objects is to provide a new and improved uncoupling device of the type described which includes therein lost motion means preventing inadvertent unlocking of the coupler to which the device is operatively connected even though unintended operation of the device occurs to a predetermined extent.

Other objects not specifically set forth will become apparent from the following detailed description of the invention made in conjunction with the accompanying drawings wherein:

FIG. 1 is a fragmentary perspective of an end of a railway car provided with the long travel cushioning arrangement described, this view illustrating operative mounting of the various elements of the uncoupling device of the present invention in such an arrangement;

FIG. 2 is a fragmentary side elevation of the uncoupling device;

FIG. 3 is a fragmentary plan view of the uncoupling device;

FIG. 4 is a partly sectioned, fragmentary view of the operating portion of the device taken generally along line 4—4 of FIG. 3;

FIG. 5 is a fragmentary end elevation of the device as viewed along line 5—5 in FIG. 3; and

FIG. 6 is an enlarged fragmentary section of a portion of the device taken generally along line 6—6 in FIG. 3.

FIG. 1 illustrates the flat deck or bed 10 of a flat car or the like which is provided with a long travel cushioning arrangement with which the uncoupling device of the present invention is particularly adapted for use. The deck 10 is of any suitable construction including an end sill 11 and a center sill structure 12 of box-like shape extending longitudinally of the car. A sliding sill 13 is telescopically received in the center sill 12 for sliding movement through the end sill 11. The sliding sill 13 is of box-like shape and may include on opposite sides thereof a channel-shaped guide member 14 which is received in an L-shaped guide track 15 fixedly carried in the center sill 12. As fully disclosed in the aforementioned patent, the sliding sill along the car is suitably engaged with a cushioning device in the form of a series of rubber cushions or a hydraulic cylinder. The sliding sill 13 projects substantially outwardly beyond the face of the adjacent end sill 11 at each end of the car and in response to operational shock, in the form of buff forces or the like, will move telescopically within the center sill 12 to compress the cushioning unit for absorption of such forces without damaging effect on the freight or lading carried on the car body. The cushioning unit will then provide for return of the sliding sill following absorption of such forces. By way of example only, force absorption travel of the type described may be utilized to an extent of from about 20 to 40 inches in either direction.

Each open projecting end of the sliding sill 13 has mounted therein a coupler 16 provided with a relatively long shank portion 17 which is suitably pivotally mounted in the interior of the sliding sill 13. The coupler 16 is free to pivot to an extent limited by the radially directed striker plate portion 18 carried by the end of the sliding sill. The coupler includes the conventional pivotally mounted knuckle 19 which is actuated by a knuckle thrower (not shown) which in turn is controlled by a locking mechanism (not shown). In all respects the coupler 16 includes conventional parts which operate in a well-known manner.

The uncoupling device of the present invention includes basic elements which are mounted along the sliding sill 13 and are movable longitudinally therewith during telescopic operation of the sill 13 relative to the end sill 11. The uncoupling device is supported along the sliding sill 13 for independent operation about a longitudinal axis thereof and is provided with manually operating means projecting outwardly therefrom along the end sill 11. The device additionally includes a coupler lock operating means which is connected to the coupler 16 to unlock the same.

Specifically, the uncoupling device includes a flat sided shaft 20 which, as illustrated, is a square shaft and is mounted along the side of the sliding sill 13. This shaft,

as best shown in FIGS. 2 and 3, is supported at its innermost end in a pipe 21 which extends thorugh the end sill 11 and is suitably fixed thereto. The outer end of the shaft 20 extends through an aperture in an upper end ear portion 22 of the side striker plate portion 18, the aperture (not shown) being of sufficient size to permit rotation of the square shaft 20 therein. The outer end of the shaft 20 is fixed against longitudinal movement relaitve to the striker plate portion 18 by a bearing collar or sleeve 23 suitably fixed to the shaft by fastening means such as a cotter pin. The end of the shaft 20 projecting beyond the striker plate portion 18 carries a fixed collar 24 thereon which cooperatively with the collar 23 fixes the shaft to the striker plate portion 18 but permits rotation of the shaft during operation of the uncoupling device as will be described. The innermost end of the shaft 20 is free to rotate within the pipe 21 and slide longitudinally therein during telescopic movement of the sliding sill 13. Thus the shaft 20 is mounted to operate with the sliding sill 13 during movement thereof relative to the end sill 11 and additionally is mounted for independent rotation about its longitudinal axis.

A crank-type lever 25 is mounted on the shaft 20 and is fixed by a shaft bearing assembly formed on the outermost end of the pipe 21 against longitudinal movement with the shaft 20 during telescopic operation of the sliding sill 13. However, the lever 25 is designed to engage the shaft 20 to rotate the same about its longitudinal axis regardless of the position of the sliding sill 13. The outermost end of the lever 25 has suitably attached thereto a link 26. This link hanges downwardly from the outer end of the lever 25 as best illustrated in FIGS. 1, 2 and 4 and at its lowermost end is suitably attached to an outwardly and downwardly projecting end portion 27 of a lifter member 28 which is in the form of a bell crank. The lifter member 28 extends radially outwardly from the sliding sill 13 along the outer face surface of the end sill 11. The central straight rod portion of the lifter member 28 is suitably journaled in brackets 29 which are attached to the end sill 11 by rivets or the like. The brackets 29 are designed to permit pivoting of the lifter member 28 and a depending straight rod-type operating handle portion 30 is formed on the outer end of the lifter member for operation thereof. As best illustrated in FIG. 2, the innermost depending portion 27 of the lifter member projects outwardly and downwardly in circumferentially offset relation to the handle portion 30 to be positioned directly below the crank lever 25. Referring particularly to FIGS. 3 and 4, the straight center portion of the lifter member 28 may be provided with a pair of stop collars 31 located on opposite sides of a bracket 29 to control positioning of the lifter member.

The outermost end of the shaft 20 projects beyond the striker plate portion 18 and the bearing collar 24 previously described. This end has fixedly secured thereto a crank-type lever 32 which extends outwardly and is inclined downwardly and carries at the outermost end thereof a radially offset, axially extending rod member 33. This rod member projects outwardly from the striker plate portion 18 to one side of the coupler 16 to prevent contact therewith during pivotal movement of the coupler. The outermost end of the rod member 33 is received through a lost motion link 34 which is held on the rod member between stop collars 35. The link 34, as best shown in FIG. 5, is of oblong shape including parallel rod portions closed at opposite ends. The bottom end of the link 34 is provided with a cross piece 36 which cooperates with the bottom end to enclose an end of an uncoupling rod 37 suitably connected therewith. The uncoupling rod 37 extends inwardly through a support bracket 38 which is fixed to the coupler 16. This bracket is of generally U-shape and is provided with a vertical bolt 39 extending therethrough and holding the uncoupling rod 37 captive therein. A side margin of the bracket 38 includes an upstanding integrally formed plate portion 40 which is suitably attached to the coupler 16 such as by welding or the like. The inner end of the uncoupling rod 37 is attached to the locking mechanism (not shown) of the coupler 16 in the known manner.

Referring particularly to FIGS. 1, 2 and 6, the end of the pipe 21 has suitably attached thereto a pair of enlarged and flared split sleeve members 41 which form a part of a bearing assembly. The split sleeve members receive therein a bearing member 42 which is formed with an enlarged end shoulder portion abutting the adjacent outer end surfaces of the split sleeve members. The bearing 42 is centrally apertured with this aperture being flat sided to conform to the configuration of the shaft 20 received therethrough. The upper end of the lever 25 is also formed with a square or flat sided aperture 25' (see FIG. 4) through which the shaft 20 is received. The upper end of the lever 25 abuts the end face of the bearing 42 and lifting of the lever 25 results in rotation of the shaft 20 and bearing 42. The lever and bearing are held against axial displacement by a retainer 43 which includes an axially extending bottom portion 44 received over the outer bottom surface of the bearing 42 and the adjacent split sleeve 41 and suitably fixed to the sleeve 41. This bottom portion also functions as an abutment surface for the lever 25 to control the extent to which the same can be moved downwardly as best shown in FIGS. 1 and 4. The upward projecting portion of the retainer 43 is formed with a clevis-type end 45 which straddles the shaft 20 and permits rotation of the shaft therethrough. Thus the lever 25 and bearing 42 are retained in longitudinally fixed positions.

The uncoupling device as illustrated in the various views of the drawings is in its inoperative position wherein the coupler 16 is locked. Lifting of the handle portion 30 results in pivoting of the lifter 28 and upward movement of the innermost end portion 27 thereof. This lifts the lever 25 through means of the link 26 and the shaft 20 rotates in a clockwise direction as viewed in FIG. 4. Rotation of the shaft 20 results in the raising of the lever 32 and a lifting of the rod member 33. Preferably, the lost motion link 34 is of sufficient overall length to permit a predetermined extent of operation of the uncoupling device without actual coupler unlocking occurring. Thus during the first extent of rotation of the shaft 20, the rod member 33 is lifted toward the upper closed end of the link 34 and until the rod member abuts the upper closed end, coupler unlocking does not occur. This arrangement prevents inadvertent coupler unlocking which might be caused by accidental lifting of the operating handle portion 30 or swinging thereof during operation of the railway car. The operating handle portion might hit an object in the road bed during car operation but sufficient lost motion of the type described is preferably built into the device to permit movement of the operating handle to a degree to clear any obstacle without coupler unlocking operation occurring.

Once the rod member 33 engages the upper closed end of the link 34, the link is then raised and pivots the uncoupling rod 33 as held down by the bracket 38. Pivoting or rotation of the uncoupling rod 33 results in operation of the locking mechanism in the coupler to an extent that the coupler is unlocked and the knuckle 19 rotates outwardly therefrom. Dropping the handle portion 30 will result in automatic return of all of the various elements to their initial positions of rest. Counterclockwise rotation of the shaft 20 is limited by abutment of the lever 25 with the retainer 43. The coupler 16 is still unlocked but upon coupling operation of the railway car, the same becomes automatically locked and the uncoupling rod 37 rotates to its original position lowering the link 34 to the position illustrated in the drawings. Telescopic movement of the sliding sill 13 does not displace any of the operating elements of the uncoupling device as only the shaft 20 slides through the lever 25 and bearing assembly carried at the outer end of the pipe 21.

Obviously certain modifications and variations of the invention as hereinbefore set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. In a railway car having a cushioning arrangement in which a coupler is mounted in a cushioned sliding sill structure projecting outwardly from an end sill of the car and movable relative to said end sill in telescopic relation in response to buff and draft forces, the provision of an uncoupling device mounted along said end and sliding sills and connected to said coupler to unlock the same, said device comprising a shaft extending along said sliding sill and through said end sill for telescopic movement with said sliding sill, means mounting said shaft on said sliding sill for pivoting thereof relative to said sliding sill, first lever means connected to said shaft adjacent said end sill, said shaft being slidable through said first lever means during telescopic movement of said sliding sill but being pivoted by said lever means upon movement thereof, operating means carried by said end sill and connected with said first lever means, second lever means connected to said shaft for pivoting therewith adjacent said coupler and movable with said shaft relative to said end sill, and coupler lock operating means extending between said second lever means and said coupler to unlock the same upon pivoting of said shaft.

2. In a railway car having a cushioning arrangement in which a coupler is mounted in a cushioned sliding sill structure projecting outwardly from an end sill of the car and movable relative to said end sill in telescopic relation in response to buff and draft forces, the provision of an uncoupling device mounted along said end and sliding sills and connected to said coupler to unlock the same, said device comprising a shaft extending along said sliding sill and through said end sill for telescopic movement with said sliding sill, means mounting said shaft on said sliding sill for pivoting thereof relative to said sliding sill, first lever means connected to said shaft adjacent said end sill, said shaft being slidable through said first lever means during telescopic movement of said sliding sill but being pivoted by said lever means upon movement thereof, operating means carried by said end sill and connected with said first lever means, second lever means connected to said shaft for pivoting therewith adjacent said coupler and movable with said shaft relative to said end sill, and coupler lock operating means extending between said second lever means and said coupler to unlock the same upon pivoting of said shaft, said coupler lock operating means including lost motion connecting means to prevent inadvertent unlocking of said coupler during operation of said device to a predetermined extent.

3. In a railway car having a cushioning arrangement in which a coupler is mounted in a cushioned sliding sill structure projecting outwardly from an end sill of the car and movable relative to said end sill in telescopic relation in response to buff and draft forces, the provision of an uncoupling device mounted along said end and sliding sills and connected to said coupler to unlock the same, said device comprising a flat sided shaft extending along said sliding sill and through said end sill for telescopic movement with said sliding sill, means mounting said shaft on said sliding sill for pivoting thereof relative to said sliding sill and about the longitudinal axis of said shaft, first lever means connected to said shaft adjacent said end sill, said shaft being slidable through said first lever means during telescopic movement of said sliding sill but being pivoted by said first lever means upon movement thereof, operating means carried by said end sill and connected with said first lever means, said operating means including a lifter rod means having an operating handle located adjacent an outer end of said end sill and hanging downwardly therefrom in its inoperative position, second lever means connected to said shaft for pivoting therewith adjacent said coupler and movable with said shaft relative to said end sill, and coupler lock operating means extending between said second lever means and said coupler to unlock the same upon pivoting of said shaft.

4. The uncoupling device of claim 3 wherein the end portion of said shaft extending through said end sill is received in a pipe fixedly mounted in said end sill and is longitudinally slidable and pivotable therein, a bearing assembly at the outer end of said pipe and receiving said shaft therethrough, said bearing assembly including bearing means pivotable with said shaft by being provided with a flat sided opening therethrough through which said shaft is received for longitudinal sliding movement relative to said bearing means.

5. The uncoupling device of claim 3 wherein the end portion of said shaft extending through said end sill is received in a pipe fixedly mounted in said end sill and is longitudinally slidable and pivotable therein, a bearing assembly at the outer end of said pipe and receiving said shaft therethrough, said bearing assembly including bearing means pivotable with said shaft by being provided with a flat sided opening therethrough through which said shaft is received for longitudinal sliding movement relative to said bearing means, and retainer means adjacent said bearing assembly and overlapping said first lever means to control the position thereof for pivoting of said shaft by said operating means.

6. In a railway car having a cushioning arrangement in which a coupler is mounted in a cushioned sliding sill structure projecting outwardly from an end sill of the car and movable relative to said end sill in telescopic relation in response to buff and draft forces, the provision of an uncoupling device mounted along said end and sliding sills and connected to said coupler to unlock the same, said device comprising a flat sided shaft extending along said sliding sill and through said end sill or telescopic movement with said sliding sill, means mounting said shaft on said sliding sill for pivoting thereof relative to said sliding sill and about the longtiudinal axis of said shaft, first lever means connected to said shaft adjacent said end sill, said shaft being slidable through said first lever means during telescopic movement of said sliding sill but being pivoted by said first lever means upon movement thereof, operating means carried by said end sill and connected with said first lever means, said operating means including a lifter rod means having an operating handle located adjacent an outer end of said end sill and hanging downwardly therefrom in its inoperative position, second lever means connected to said shaft for pivoting therewith adjacent said coupler and movable with said shaft relative to said end sill, and a coupler lock operating means extending between said second lever means and said coupler to unlock the same upon pivoting of said shaft, said coupler lock operating means including lost motion connecting means to prevent inadvertent unlocking of said coupler during operation of said device to a predetermined extent.

7. The uncoupling device of claim 6 wherein the portion of said shaft extending through said end sill is received in a pipe fixedly mounted in said end sill and is longitudinally slidable and pivotable therein, a bearing assembly at the outer end of said pipe and receiving said shaft therethrough, said bearing assembly including bearing means pivotable with said shaft by being provided with a flat sided opening therethrough through which said shaft is receievd for longitudinal sliding movement relative to said bearing means.

8. The uncoupling device of claim 6 wherein the portion of said shaft extending through said end sill is received in a pipe fixedly mounted in said end sill and is longitudinally slidable and pivotable therein, a bearing assembly at the outer end of said pipe and receiving said shaft therethrough, said bearing assembly including bearing means pivotable with said shaft by being provided

with a flat sided opening therethrough through which said shaft is received for longitudinal sliding movement relative to said bearing means, and retainer means adjacent said bearing assembly and overlapping said first lever means to control the position thereof for pivoting of said shaft by said operating means.

9. In a railway car having coupler means mounted on a longitudinal sill which projects outwardly from an end of the car and which is movable relative to said end longitudinally of said car in response to buff or draft forces, the provision of an uncoupling device mounted on said car and comprising an elongate uncoupling shaft means extending longitudinally of said sill, support means engaging said shaft means and mounting the same for movement longitudinally with said sill, further means forming a part of said support means providing for movement of said shaft means independently from the movement thereof with said sill, first operating means extending transversely of said car from at least adjacent a side area thereof in a direction toward said shaft means at least approaching a right angular relationship therewith, engaging means forming a part of said first operating means and being positioned relative to said shaft means for engagement thereof in said angular relationship to move the same without interfering with the movement of said shaft means with said sill, and coupler lock operating means extending between said shaft means and said coupler means for lock operation of said coupler means during said independent movement of said shaft means.

10. The railway car of claim 9 wherein said shaft means is mounted relative to said sill for said independent movement about an axis longitudinal of said shaft means.

11. In a railway car having coupler means mounted on a longitudinal sliding sill structure which projects outwardly from an end sill of the car and which is movable relative to said end sill longitudinally of said car in response to buff or draft forces, the provision of an uncoupling device mounted along said end sill and sliding sill structure and comprising an uncoupling shaft means movable longitudinally with said sliding sill during movement thereof relative to said end sill, means supporting said shaft means along said sliding sill for longitudinal movement with said sliding sill and independent rotation of said shaft means about an axis longitudinal thereto, first operating means forming a part of said device and projecting outwardly from said sliding sill along said end sill and adapted to independently rotate said shaft means, and coupler lock operating means forming a part of said device and connected between said shaft means and said coupler means to unlock the same during independent rotation of said shaft means.

12. In a railway car having coupler means mounted on a longitudinal sliding sill structure which projects outwardly from an end sill of the car and which is movable relative to said end sill longitudinally of said car in response to buff or draft forces, the provision of an uncoupling device mounted along said end sill and sliding sill structure and comprising an uncoupling shaft means movable longitudinally with said sliding sill during movement thereof relative to said end sill, means supporting said shaft means along said sliding sill for longitudinal movement with said sliding sill and independent rotation of said shaft means about an axis longitudinal thereto, first operating means forming a part of said device and projecting outwardly from said sliding sill along said end sill and adapted to independently rotate said shaft means, and coupler lock operating means forming a part of said device and connected between said shaft means and said coupler means to unlock the same during independent rotation of said shaft means, said coupler lock operating means comprising lost motion connecting means to prevent inadvertent unlocking of said coupler means during rotation of said shaft means to a predetermined extent.

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