Feb. 20, 1968 H. D. BREEN ETAL 3,369,502

LADING SEPARATOR

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FIG. 1

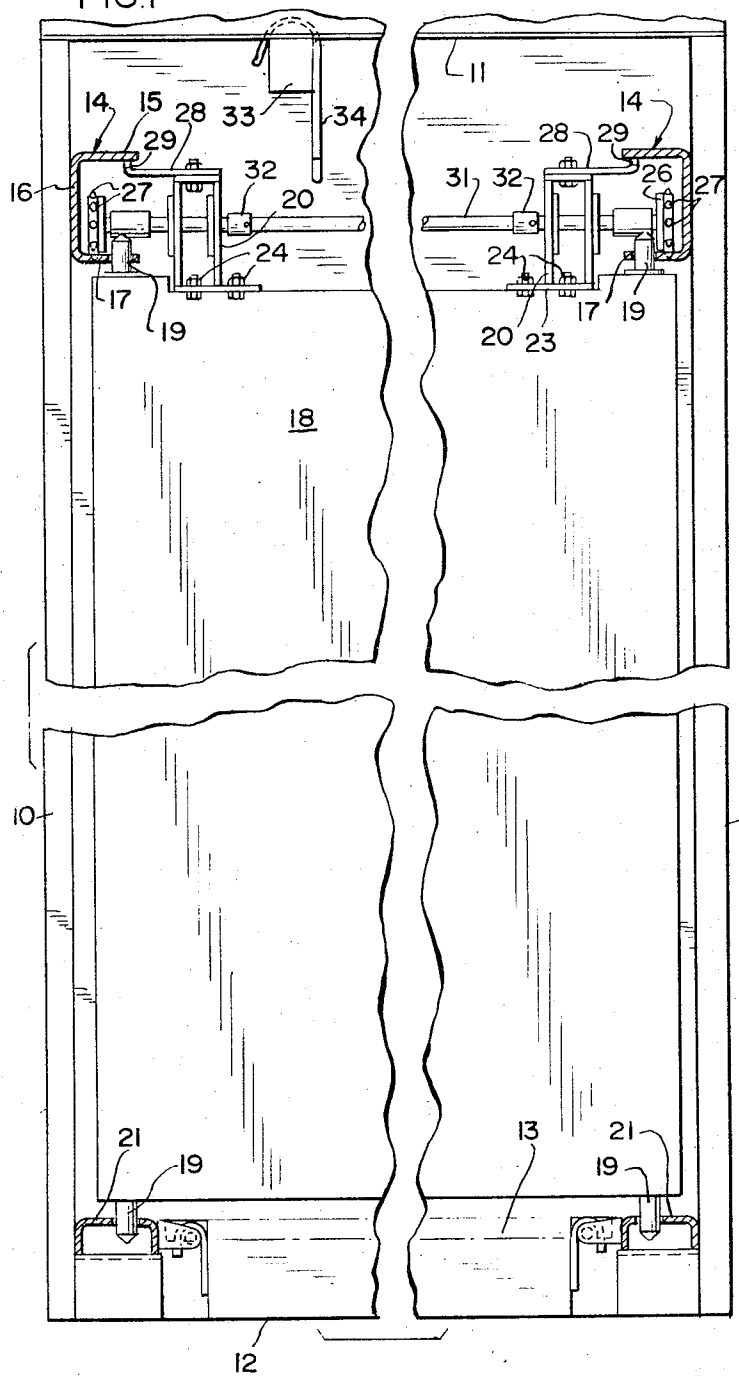
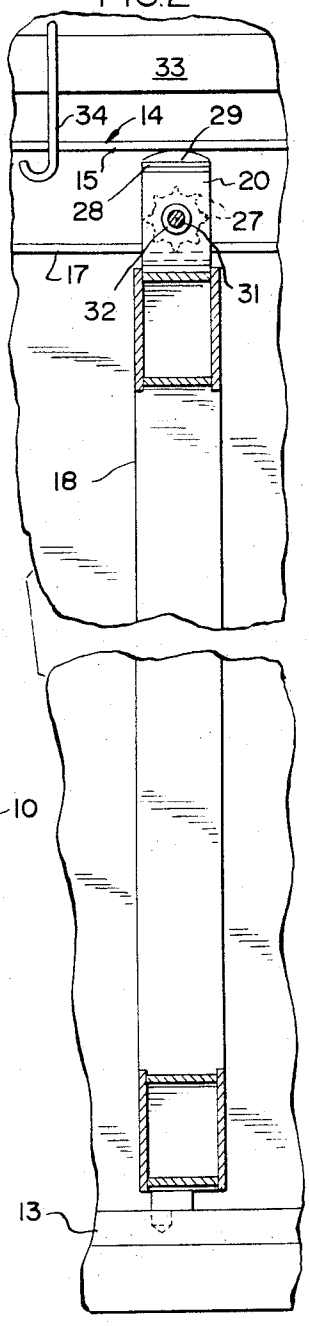


FIG. 2



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FIG. 5

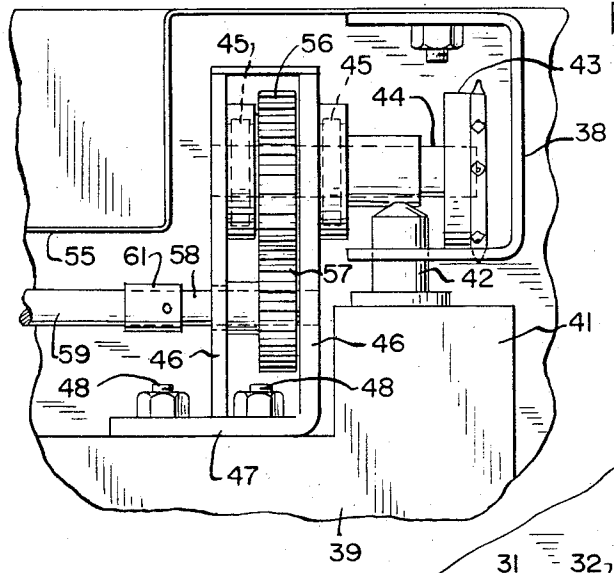


FIG. 3

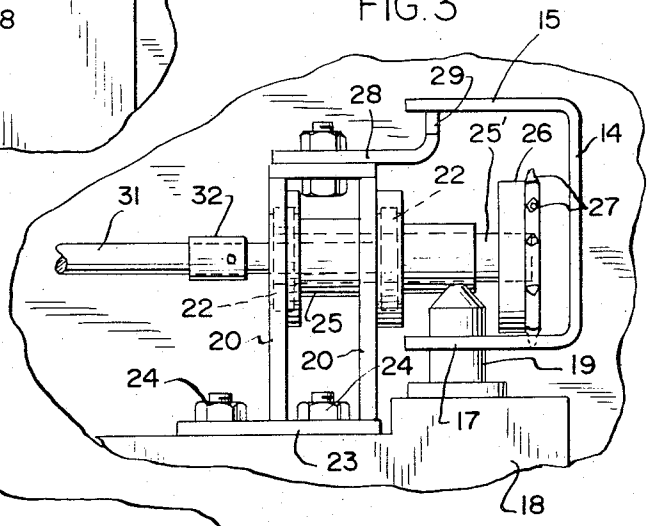
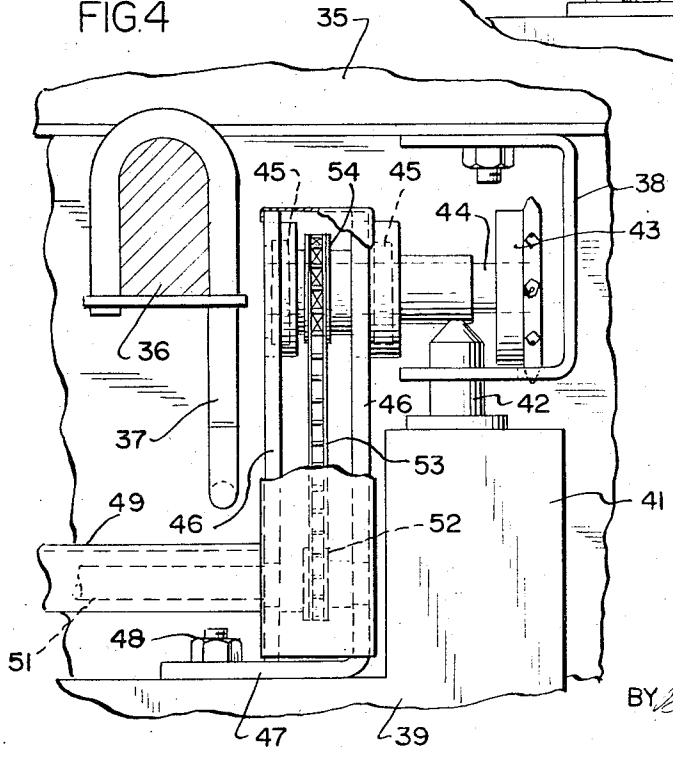


FIG. 4



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LADING SEPARATOR

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7 Claims. (Cl. 105—376)

ABSTRACT OF THE DISCLOSURE

In lading separators of the type that include spaced parallel tracks, support means on the tracks and a bulkhead supported from the tracks, an improvement is provided in having the bulkhead located below the tracks and having hanger supports on the bulkhead extending upwardly inwardly of the tracks and having bearing structures that carry stub shafts on which are mounted the roller members and anti-cocking elements for cooperation with the tracks. In order to insure that the stub shafts rotate in unison, a non-load-bearing cross shaft is provided having connections between the cross shaft and the stub shafts that is capable of accommodating angular misalignment. Such an arrangement is less expensive than previous constructions where the support means must be accurately constructed to obtain proper alignment. The connection means which is capable of accommodating the misalignment may be in the form of flexible couplings or by offset drive means between the cross shaft and stub shafts carried by the hanger supports. The track means are desirably defined by channel shaped members and simple hold-down means cooperate with one leg of the channel to prevent dislocation of the roller means from the tracks.

This invention relates to a lading separator and more particularly to mounting arrangements for a lading separating bulkhead or door in a railroad car.

It has become common practice in recent years to suspend a lading separating bulkhead or door in a railroad car for movement along tracks at the sides of the car and for latching in selected positions in the car to separate the lading therein. Usually a cross shaft extends across the car and is supported on rollers or sprockets which ride on the tracks with the bulkhead or door suspended from the shaft. In addition to supporting the bulkhead or door, the shaft causes the rollers or sprockets to turn together to prevent the bulkhead or door from cocking in the car and to maintain it square in the car at all times.

These constructions require a heavy shaft to carry the weight of the bulkhead or door and accurately aligned bearings in which the shaft is journaled. This usually requires that the bearings be connected by a beam or housing which holds the bearings in alignment and from which the bulkhead or door is suspended.

It is accordingly an object of the present invention to provide a lading separator in which the rollers are connected for simultaneous rotation by a relatively light cross shaft which is not required to carry any part of the weight of the bulkhead or door.

According to a feature of the invention, the rollers are carried by stub shafts journaled in elongated or spaced bearings mounted on top of the bulkhead with the stub shafts being connected for simultaneous rotation by a light cross shaft. Preferably, the cross shaft is connected to the stub shafts through flexible couplings to accommodate slight misalignment.

Another problem encountered with prior construction is the provision of clearance for ceiling obstructions in cars, such as load carrying hooks or brackets, plenum

chambers or the like, which are normally suspended from the ceiling of the car centrally of its width. The usable space in a car is normally calculated to be the space from the floor of the car to the bottoms of the tracks. Therefore, if the tracks must be lowered to clear obstructions at the top part of the car, the usable space is correspondingly reduced.

It is therefore a further object of the present invention to provide a lading separator in which substantially any desired degree of clearance can be provided between the car ceiling and the upper edge of the bulkhead or door.

According to a feature of the invention, the rollers are mounted on stub shafts journaled in bearings at the sides of the bulkhead or door and which are connected for simultaneous rotation by a cross shaft off-set below the stub shafts and connected thereto through vertically extending driving means such as gear trains or sprockets and chains.

The above and other objects and features of the invention will be more readily apparent from the following description when read in connection with the accompanying drawings in which:

FIGURE 1 is a transverse, partially schematic sectional view through a typical railroad car with a lading separator embodying the invention;

FIGURE 2 is a section at right angles to FIGURE 1;

FIGURE 3 is a partial enlarged view similar to FIGURE 1;

FIGURE 4 is a view similar to FIGURE 3 of an alternative construction; and

FIGURE 5 is a view similar to FIGURES 3 and 4 of still another alternative construction.

The lading separator of the present invention is adapted to be installed in substantially any desired type of railroad car, such as a box car or refrigerator car. Cars of this type, as partially illustrated in FIGURE 1, have side walls **10**, a roof or ceiling defined by transversely extending beams **11** over which a roof covering may be supported, and a floor or subfloor **12** above which a lading supporting floor or, in the case of a refrigerator car, a rack **13** is supported. The side walls are generally provided with doors centrally of the car length through which lading may be loaded into and removed from the car.

For supporting the lading separator of the present invention in the car, elongated tracks as shown generally at **14** are mounted in the car adjacent to the juncture of the side walls and the ceiling. As shown, each track **14** is generally C-shaped with an upper horizontal flange **15**, a vertical web **16** lying against and secured to a side wall of the car, and a lower horizontal flange **17**. The lower horizontal flange **17** of each track is formed adjacent to its free edge with a series of relatively large latching openings to receive latching pins as described hereinafter. Between the flange of the track and the latching openings, the horizontal flange **17** is additionally formed with a relatively closely spaced series of small openings to receive the teeth on sprocket wheels as described more fully hereinafter.

The lading separator comprises a bulkhead or door indicated at **18** which may be of any desired construction and which is preferably of a size substantially to span the width of the car and of a height to extend from a point closely adjacent to the floor of the car to a level just below the horizontal flanges of the tracks as shown. The door **18** may have solid faceplates as illustrated in FIGURE 1 to engage the lading or could be, if desired, an open framework type of construction, depending upon the type of lading to be carried in the car. The door carries at its four corners vertically extending latch pins **19** which are vertically movable to move from retracted positions within the door to extended latching positions as shown.

When extended, the upper latch pins **19** will extend through the latching openings in the lower flanges **17** of the tracks and the lower latch pins will extend through similar openings in latching strips **21** mounted in the floor of the car. With the latch pins so extended and in latching engagement in the latching openings, the bulkhead or door will separate the car longitudinally into lading receiving compartments.

To support the bulkhead for movement longitudinally of the car, it is connected at its top and adjacent to its side edges to a pair of upwardly extending brackets or plates **20** which carry bearings **22** as shown in FIGURE 3. As shown, the plates **20** are connected to a horizontal baseplate **23** which may be secured by bolts **24** to the upper edge of the bulkhead **18**. A tubular stub shaft **25** is journaled in the bearings **22** and projects outwardly therefrom toward a combined roller and sprocket **26**. As shown, the combined roller and sprocket includes a smooth cylindrical portion which rides on the bottom flange **17** of the track and a sprocket portion having teeth **27** thereon which fit into the sprocket openings in the lower flange **17** of the adjacent track to prevent any slippage between the rollers and the tracks. A short shaft **25'** telescopes into the tubular stub shaft **25** and is keyed or splined thereto for rotation together but for lengthwise sliding to accommodate variations in spacing between the tracks. The combined roller and sprocket **26** is secured to the shaft **25'**. Preferably, a plate **28** is fastened across the upper ends of the plates **20** and has an upwardly turned, rounded end as shown at **29** in FIGURE 2 extending into the adjacent track and spaced slightly from the upper flange **15** thereof to prevent the rollers and sprockets from disengaging the track flange **17**. The rounded end **29** will permit tilting of the bulkhead without binding against the track.

The stub shafts and sprockets and rollers at opposite sides of the bulkhead are connected for simultaneous rotation by a cross shaft **31**. The cross shaft, as shown, is generally aligned with the stub shafts, but is preferably connected thereto at its ends through flexible couplings **32** which will accommodate a slight degree of angular misalignment. It will be noted that the cross shaft **31** extends along and is spaced slightly above the upper edge of the bulkhead and is connected thereto only through the stub shafts and the bearing construction. The cross shaft therefore does not carry any of the weight of the bulkhead and can be made quite light since it is required only to transmit whatever torque may be involved in causing the rollers at opposite ends of the bulkhead to turn together.

As will be noted from FIGURES 1 and 2 particularly, when the roof structure of the car carries any type of load supporting means or similar obstructions, it becomes necessary to lower the tracks below the roof. For example, as illustrated in FIGURE 1 and FIGURE 2, the car is provided with longitudinally extending beams **33** secured to and projecting below the ceiling beams **11** and which support hooks **34** for carrying meat carcasses or similar ladings. When obstructions of this type are present in the car, it becomes necessary to lower the tracks **14** to a position such that the obstruction will not engage the cross shaft **31** or any of the other lading separator parts.

In order to provide clearance for devices such as the hooks **34** without lowering the tracks in the car, a construction as shown in FIGURE 4 may be employed. In this construction, as illustrated, the ceiling beams **35** of the car carry longitudinally extending beams **36** on which downwardly projecting hooks **37** are carried. The tracks as shown at **38** which may be identical to the tracks **14** of FIGURES 1–3 are secured to the ceiling beams and may also be secured to the side walls of the car so that they lie closely at the juncture of the ceiling beams and the side wall. The bulkhead as shown generally at **39** is provided with upwardly extending side posts **41** which terminate closely beneath the lower horizontal flanges of the tracks and from which the latching pins **42** may project.

In this construction the bulkhead is supported on combined rollers and sprockets **43** which may be identical to the combined rollers and sprockets **26** of FIGURES 1–3 and which engage the tracks in the same manner. The rollers and sprockets **43** are mounted on stub shafts **44** which are journaled in spaced or elongated bearings **45** carried by spaced, vertically extending plates **46**. As shown, one of the plates **46** is formed with a horizontally extending flange **47** to which the lower edge of the other plate is secured as by welding and which is connected to the upper edge of the bulkhead by fastening means such as bolts **48**.

A channel section housing **49** extends between and is secured to the inner plate **46** at opposite sides of the bulkhead. A relatively light cross shaft **51** extends through the housing **49** and is journaled in light bearings in the plates **46**. At its opposite ends, the cross shaft carries sprockets **52** over which a sprocket chain **53** is trained. The sprocket chain **53** is also trained over a sprocket **54** connected to each of the stub shafts **44**.

With this construction, it will be noted that the cross shaft lies at a level substantially below the level of the stub shafts and is connected thereto through vertically extending driving means comprised by the sprockets **52** and **54** and the chain **53**. Thus, the cross shaft may be located at any desired level below the level of the tracks so that the bulkhead or door may be moved freely in the car along the tracks without creating interference with any load supporting or other mechanisms extending down from the ceiling of the car. Also, with this construction exact alignment between the bearings **45** and the cross shaft bearings is not required since the sprocket and chain drive mechanisms will accommodate slight angular misalignments between the cross shaft and the stub shafts.

FIGURE 5 illustrates an alternative construction generally similar to FIGURE 4 and in which parts corresponding to like parts in FIGURE 4 are indicated by the same reference numerals. In this construction, as shown, the ceiling of the car carries a plenum chamber **55** through which cooling or ventilating air may be circulated in and through the car as is common in refrigerator cars. The stub shafts **44** carry relatively large gears **56** which mesh with gears **57** carried by shafts **58** journaled in the plates **46** generally parallel to and below the stub shafts. The shafts **58** at opposite ends of the bulkhead are connected by a light cross shaft **59** extending across the top of the bulkhead and which is connected to the shafts **58** by flexible couplings **61** to accommodate slight misalignments between the cross shaft and the shafts **58**.

With this construction, as with that of FIGURE 4, the cross shaft and the top of the bulkhead may be positioned at substantially any desired height in the car without requiring lowering of the tracks. It will be seen that by varying the size of the gears **56** and **57** or perhaps by including more than two gears in the driving connection substantially any desired vertical spacing can be obtained between the stub shafts **44** and the shafts **58** and cross shaft **59**. At the same time the weight of the bulkhead or door is carried by the stub shafts and their bearings without imposing any load on the cross shaft.

While several embodiments of the invention have been shown and described in detail, it will be understood that these are for the purpose of illustration only and are not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. In a lading separator of the type that includes a pair of spaced parallel tracks having elongated support surfaces, support means for engaging the tracks and including roller members arranged to roll on the support surfaces of said spaced tracks, and a bulkhead suspended from such support means, the improvement comprising, in combina-

tion, the bulkhead being located below the tracks and having thereon spaced hanger supports located inwardly of the tracks and extending upwardly from the bulkhead to a level above the support surfaces of the tracks, the support means including bearing structure carried on each said hanger support and telescopically carrying stub shafts on which are mounted said roller members and anti-cocking elements for cooperation with said track means and so as to fully support the bulkhead from said track means, and cross shaft means operatively associated through connection means with said stub shafts to cause them to rotate in unison, the connection means being capable of accommodating angular misalignment between the cross shaft and the stub shafts.

2. A device as in claim **1** wherein the cross shaft means includes a cross shaft generally aligned with the stub shafts and connected thereto through flexible couplings.

3. A device as in claim **1** wherein the cross shaft means includes a cross shaft whose axis is offset radially from the axes of the stub shafts, and drive means interconnecting said stub shafts and cross shaft to cause said shafts to rotate in unison.

4. A device as in claim **3** wherein the drive means between the stub shafts and cross shaft is carried by said hanger supports.

5. In a lading separator of the type that includes a pair of spaced parallel track means having elongated support surfaces, support means for engagement with the track means and including roller members and sprocket means arranged to roll on the support surfaces of said spaced track means, and a bulkhead carried by said support means, the improvement comprising, in combination, an elongated member parallel to the supporting surface of each track means and spaced above the track means a distance sufficient to permit free axial movement of the roller members and sprocket means into position onto the

track means, and hold-down means carried by and movable with said bulkhead and spaced axially from the sprocket means, said hold-down means extending into closely spaced relation with the side of said elongated member that faces the track means and cooperating with said elongated member to prevent the roller member and sprocket means from disengaging with the track means.

6. A device as in claim **5** wherein the bulkhead is supported to pivot about the axis of said roller means, and wherein the hold-down means provides that a surface thereof which faces the elongated member is rounded to permit pivoting of the bulkhead about the axis of the roller means without binding.

7. A device as in claim **5** wherein the track means and the elongated member spaced above the track means are part of a channel-shaped member, with the lower flange of the channel-shaped member serving as the track means and having a series of openings therein to receive the teeth of the sprocket means.

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