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(54) Stowable bulkhead for vehicle body

(57) A movable barrier/bulkhead mounting and securing system, especially suited for use in a truck body (10), comprises tracks (14) extending the length of the body and positioned on the ceiling (15); the bulkhead (13) being hingedly mounted on a trolley (16) that can run along these tracks, the bulkhead's gas-strut counterweights (17) being positioned in the depth of the trolley (that is, in the space between the top of the trolley, adjacent the ceiling, and the bottom, up against which the bulkhead hinges when stowed). The bulkhead when stowed adjacent the ceiling activates a friction brake that in use bears against the ceiling (or the trolley track) and so prevents the trolley carrying the thus-stowed bulkhead from moving along the track (Figure 3).

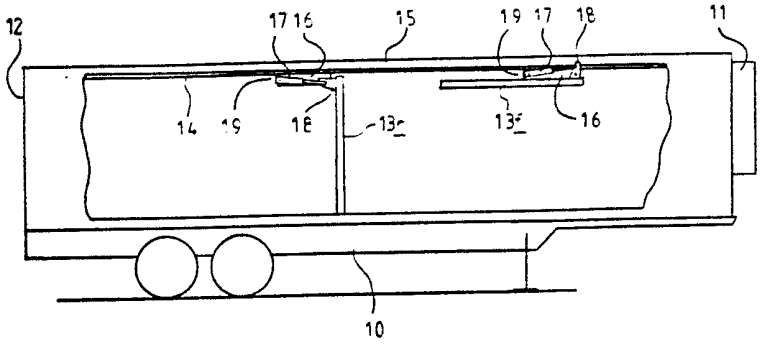

FIG.1

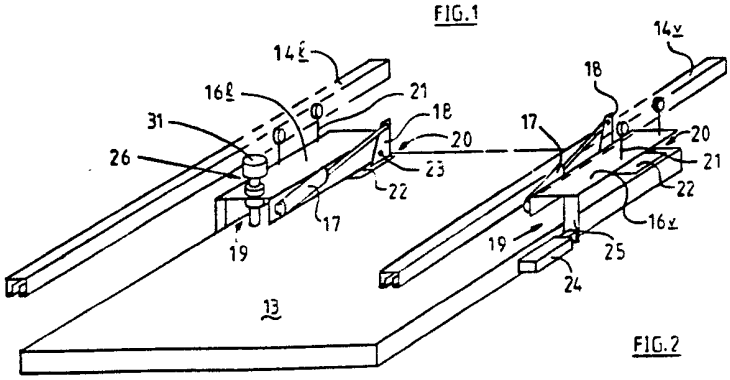

FIG.2

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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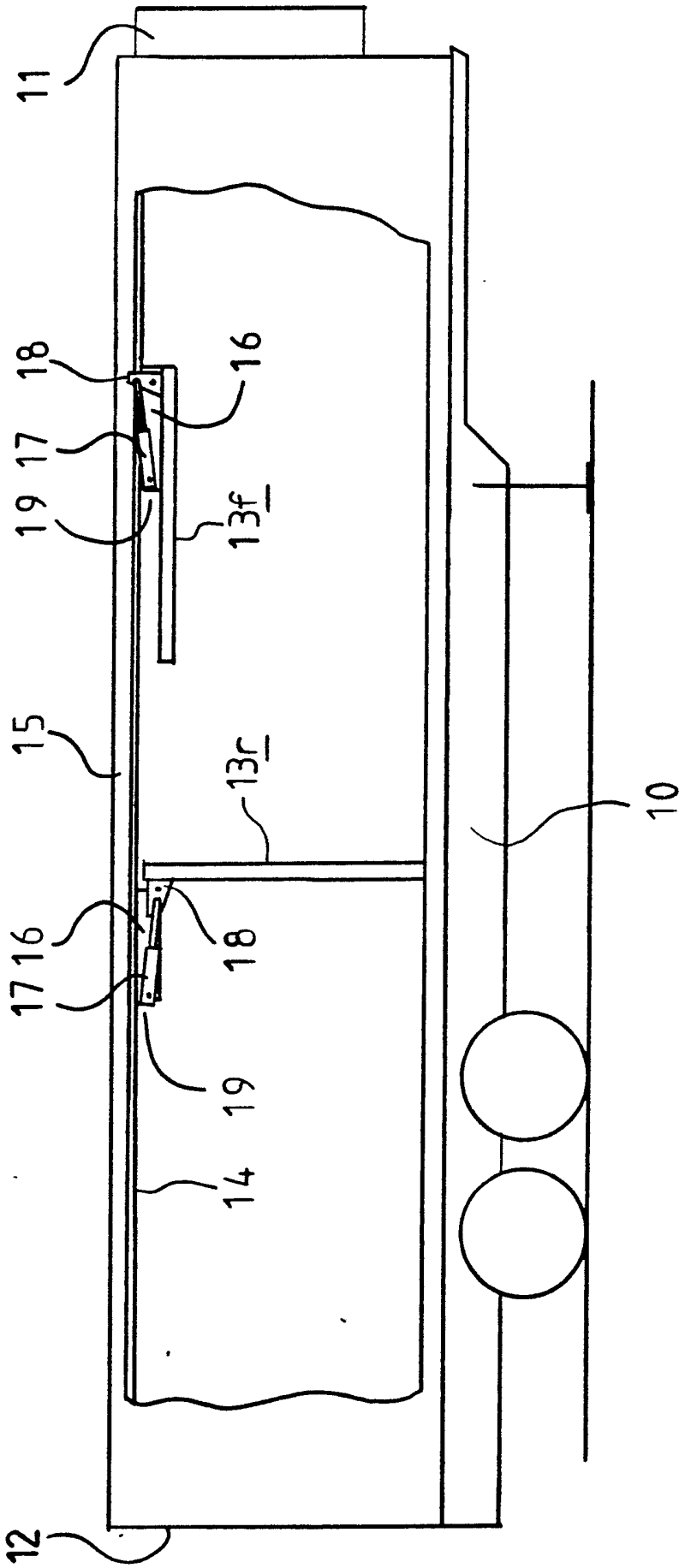

FIG.1

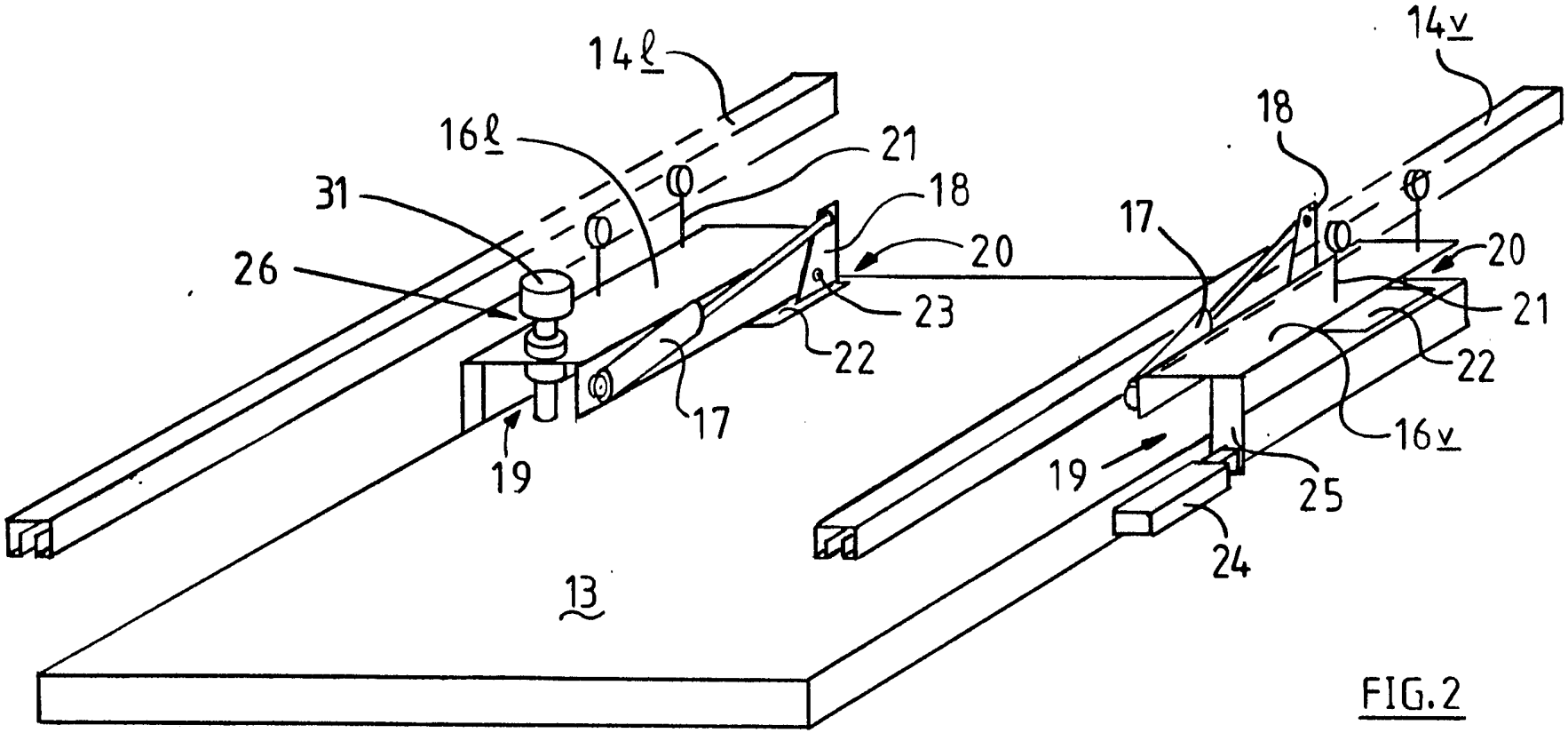

FIG.2

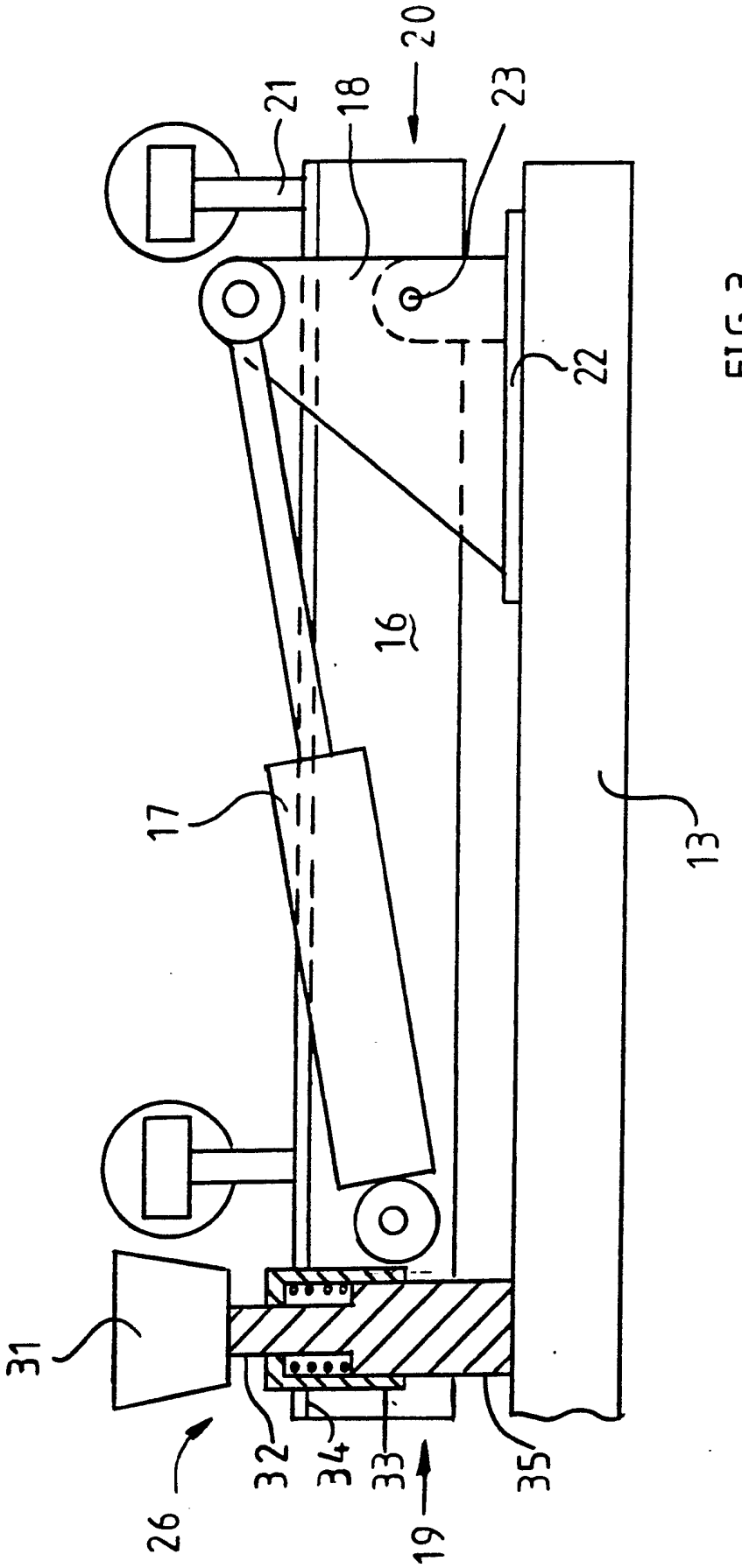

FIG.3

Movable Barriers

This invention relates to movable barriers, and concerns in particular bulkheads that are situated within large containers (such as lorry and truck bodies) and that can be moved from one position therein to another.

It is common for the available volume within a large container to be divided up into two or more smaller portions by some sort of barrier in the nature of a partition or bulkhead. Moreover, it is often the case that the or each barrier is movable, from one position to another, so that the size of each portion of the whole space may be altered to suit the purpose of the moment. In addition it may be desirable to be able to remove each barrier entirely - or, and preferably, to fold it out of the way, flush with a wall, the floor or the ceiling, perhaps. An example of the division of a container in this way is the present-day refrigerated truck (lorry) body, where it is sometimes required to split the available space into three - a very cold area at the front (adjacent the refrigeration unit), a merely cool area at the rear (adjacent the back doors), and a cold area intermediate the two - but where not only must the volume of these three areas be adjustable depending upon the circumstances (how much of, say, meat, dairy products or vegetables the truck is to transport) but in addition it may be required to have only two partitions (very cold, and cold), or even only one (very cold), depending on how much of what Goods is to be carried.

Various schemes for movable barriers - "bulkheads" in the truck field - have been proposed and, indeed, executed, especially for "up-and-over" ones that hinge up out of the way adjacent the body's roof, though none seem to have been wholly satisfactory. Some have required the rails, tracks or channels along which the bulkhead can be moved to be affixed to the internal surface of the truck body side walls, but these have been difficult to mount firmly (the side walls of truck bodies are often very flimsy) and have made "sealing" the bulkhead against the wall surface rather a problem. Furthermore, because the bulkheads employed are heavy, even when made from the lightest available materials (rigid foamed polystyrene panels sealed within some suitable front and back skin are generally used in refrigerated trucks), they usually need some sort of counterweight mechanism - commonly of the gas-strut variety - to balance the load, and render them easier to stow (to swing up into the out-of-the-way storage position) and to deploy (to swing down into their use position). Additionally, the means most often employed to secure the bulkhead against movement along the body when in its stowed position has been one or more simple bolt sliding into the relevant one of a series of corresponding sockets disposed in another rail running the length of the truck body side wall, and not only is this rail, too, difficult to mount and seal against but the (usually metal) bolts themselves, secured as they are into the bulkhead material, serve as pathways for heat transfer, which in a refrigerated truck could be most undesirable.

The present invention suggests a rather different arrangement of barrier/bulkhead mounting and securing system, especially suited for use in a truck body, in which tracks extending the length of the body are

positioned on the ceiling, and the bulkhead is hingedly mounted on a trolley that can run along these tracks, the bulkhead's gas-strut counterweights being positioned in the depth of the trolley (that is, in the space between the top of the trolley, adjacent the ceiling, and the bottom, up against which the bulkhead hinges when stowed). Further, the invention suggests that the bulkhead when stowed adjacent the ceiling should activate a simple friction brake that in use bears against the ceiling (or the trolley track) and so prevents the trolley carrying the thus-stowed bulkhead from moving along the track.

In one aspect, therefore, the invention provides a barrier mounting arrangement useable to adjustably and reversibly partition a volume within a hollow body such as that of a lorry or truck into two smaller volumes spaced along the body, which arrangement comprises:

a track mountable along the ceiling of the body;

a trolley movable in the track, and bearing hinged barrier attachment means to which may be attached the barrier for in-use pivotal movement between a stowed position adjacent and parallel to the ceiling and a deployed position depending from the ceiling and dividing the volume into two; and

gas-strut counter-weight means acting between the trolley and the barrier attachment means and positioned within the depth of the trolley.

In a second aspect, the invention provides braking apparatus for employment with a barrier mounting arrangement useable to adjustably and reversibly partition a volume within a hollow body such as that of a lorry or truck into two smaller volumes spaced along

the body, which arrangement includes a track mountable along the ceiling of the body, and a trolley movable in the track and bearing hinged barrier attachment means to which may be attached the barrier for in-use pivotal movement between a stowed position adjacent and parallel to the ceiling and a deployed position depending from the ceiling and dividing the volume into two, which braking apparatus comprises:

a friction brake mounted on the trolley and operatively engageable with the ceiling or track but biassed out of engagement therewith, which brake is drivable by the barrier into engagement against the bias when the barrier is raised into its stowed position.

In its first aspect the invention provides a mounting arrangement for a space-dividing barrier. That sort of barrier with which the invention is typically concerned is a bulkhead for use within a lorry or truck body, particularly a refrigerated body, and for the most part the invention is discussed in such terms hereinafter. Thus, the invention is primarily concerned with the way in which, in a refrigerated truck body, a bulkhead may be disposed within the body so as to partition the available space (into a front part and a rear part), and the way in which it is so disposed allows it not only to be moved along the body, to vary the point at which the body is so partitioned, but also to be swung (up to the ceiling) completely out of the way, so as to leave the body unpartitioned.

Naturally, any one truck body may contain one, two, or even more bulkheads according to the invention (and, perhaps, some that are not). Generally, however, two bulkheads are sufficient, so that a refrigerated body

can be divided into three portions - cool, cold and very cold.

the barrier/bulkhead itself may be of any suitable size and shape (usually to fit the body) and material (for a refrigerated truck this is very preferably a good insulator, such as a sandwich of expanded polystyrene or foamed polyurethane with an impermeable coating on either face). Moreover, it may - especially for use in a refrigerated body - be a "sealing" fit to the inside surface of the body's walls, floor and ceiling; this can conveniently be achieved by fitting a brush-type sealing strip all round the bulkhead's perimeter.

The invention requires a track mounted on the body's ceiling, with a trolley carrying the barrier/bulkhead borne in the track so as to be movable therealong. The track may be of any convenient variety; one such shown in the accompanying Drawings, is a rectangular section tube with a lengthwise slot, intended to be used with a trolley that is mounted thereon via wheels running within the tube and supporting the trolley by a pylon-like leg extending out through the slot.

Though it would be possible to have a single track, it is more convenient to have two (this may alternatively be regarded as one track with two rails) spaced apart across the width of the body and bearing the trolley between them. Moreover, it is generally preferable to have not a single trolley spanning the two tracks but rather two separate trolleys, one for each track.

The (or each) trolley bears hinged barrier attachment means - in general the barrier/bulkhead is simply hinged onto the trolley in any suitable way. Conveniently, though, the attachment means comprises a

plate member bent (out of its plane) into an L shape and hinged to the trolley by an axle pin positioned along the length of the L's upright. This provides a flat surface (the L's base) to which the bulkhead is actually attached and a lever arm (the projecting part of the L's upright) to which the gas-strut counterweight means can be secured (see below). Such an arrangement is shown in the accompanying Drawings.

The hinged attachment means, which is preferably hinged to the trolley near one end thereof, carries the barrier/bulkhead, and allows it to be swung between a stowed position adjacent and parallel to the ceiling and a deployed position hanging down to partition the body. Even when made of the lightest suitable materials a large bulkhead - as in a refrigerated truck body, for instance - may be quite heavy, requiring a considerable effort to swing it unaided between its stowed and deployed positions. Accordingly, there is very preferably employed counterweight means - specifically, a gas strut (which is a quite conventional means for reducing the apparent load of an up-and-down swinging barrier) which acts between the trolley and the hinged attachment means (conveniently at the "free" end of the projecting L upright, as mentioned above). Most preferably there is one gas strut <u>per</u> trolley (so in the preferred case there are two struts for each barrier/bulkhead) positioned within the depth of the trolley - that is, positioned in the space between the ceiling and where the bulkhead comes, just below the trolley, when stowed.

When the barrier/bulkhead is in its deployed position, depending from the trolley, its inertia can be relied on to keep it in place - that is, so deployed. However, when in its stowed position inertia will be

acting to unstow it, and therefore it is advantageous to provide lock means whereby, when stowed, the bulkhead may be securely but releasably locked to the trolley. While some sort of bolt and eye mechanism might be used, a preferred lock means is a conventional slamlock, as in a door catch, with a spring-loaded chamfered latch member on the bulkhead co-operating with a keep on the trolley (or vice versa). There may be a single lock means to each bulkhead, but it is safer, and more robust, to have one per trolley.

Although when in its deployed position a barrier/bulkhead will stay more or less in the correct place, this is not so when it is in its stowed position, when it may well move with its trolley up or down the track. To prevent this it is desirable to have some sort of trolley securing means - and a particularly advantageous such means is a friction brake mounted on the trolley and operatively engageable with the ceiling or track but biassed out of engagement therewith, which brake is drivable by the barrier into engagement against the bias when the barrier is raised into its stowed position (this idea is novel and inventive in itself, and so forms a second aspect of the invention).

A friction brake is a brake that operates by motion-retarding friction between a brake surface (a brake pad) and some other surface movable relative thereto. In the present case it is intended that the brake surface should be mounted on the trolley, the other surface (against which the brake surface is frictionally to bear) being either the track along which the trolley runs or, and preferably, the ceiling on which the track is mounted.

The friction brake is biassed out of engagement with the surface against which it is to act, so that unless driven thereagainst it does not engage that surface, and so does not cause any braking effect. The required bias is conveniently achieved by some form of spring loading, and such an arrangement, shown in the accompanying Drawings, has a brake pad mounted on the end of a rod that is movable lengthwise in a sleeve but is biassed, by a spring mounted between the rod and sleeve, to that end of its travel that brings the pad nearest the sleeve.

The friction brake is so disposed on the trolley that, when the barrier/bulkhead is raised into the stowed position, the bulkhead physically contacts the brake and pushes it, against the bias, into engagement with the relevant surface. In the preferred spring-loaded rod-and-sleeve embodiment discussed above, the rod's free end - the end not carrying the brake pad - projects down from the trolley into contact with the bulkhead (when stowed), and is thus pushed up against the spring to bring the pad into frictional contact with the ceiling (or track).

The friction brake apparatus of this invention is most preferably employed with a barrier set-up that makes use of the barrier mounting arrangement of the invention, though it does not have to be (and other barrier mounting arrangements could be used).

The invention extends, of course, to a body, such as a lorry or truck body, that is partitioned using a barrier mounting arrangement, and/or a friction brake apparatus, as described and claimed herein.

An embodiment of the invention is now described, though by way of illustration only, with reference to the accompanying Drawings in which:

Figure 1 shows a see-through side view of a refrigerated truck body employing a bulkhead mounting arrangement of the invention;

Figure 2 shows a perspective view of a bulkhead mounting arrangement as used in the truck body shown in Figure 1; and

Figure 3 shows a part see-through part sectional side view of a bulkhead mounting arrangement as shown in Figure 2.

Figure 1 shows a refrigerated truck body (10: the tractor unit is not shown). The body has a refrigeration unit (11) at the front, doors (12: not shown separately) at the rear, and two front and rear partitioning bulkheads (13f, 13r) suspended from two tracks (14: only one is shown in Figure 1, but both are shown in Figure 2) mounted, by means not shown, along the ceiling (15) of the body. The front (right, as viewed) bulkhead 13f is in its stowed position, while the rear (left, as viewed) one 13r) is in its deployed position.

As is best seen in Figures 2 and 3, each bulkhead is in fact itself hingedly attached to a trolley (as 16), and has a gas-strut counterweight (as 17) secured between a lever arm (as 18, fixed relative to the bulkhead's hinged end) and the distant end (19) of the trolley.

As can best be seen from Figure 2, there are two spaced-apart parallel tracks (14l, 14r), each in the form of a rectangular-section tube with a lengthwise slot through which passes the wheeled pylons (as 21) carrying the relevant trolley (16l, 16r). Each trolley has hinged at one end thereof (in this case, the front end, 20) the upper edge area of a bulkhead 13 - there is a mounting plate (as 22), to which the bulkhead is affixed, forming the horizontal part of an L, and the upright 18 of the L is pivoted via a stub axle (as 23) to the trolley 16, to form the required lever arm. Mounted between each trolley's rear end 19 and the free end of the lever arm 18 is a gas-strut counterweight 17 to help relieve the load when the bulkhead is swung between the stowed position (as shown in Figure 2, and in the right part of Figure 1) and the deployed position (as shown in the left part of Figure 1).

When in its stowed position, each bulkhead is "locked" into place therein by a conventional slamlock (24) mounted on the bulkhead edge and co-operating with a keep (at 25, but not separately shown) on the trolley.

In its deployed state each bulkhead 13 can be run up and down the tracks 14 to whatever position is desired, so partitioning the truck body into larger or smaller parts. However, in its stowed state it is preferred that each bulkhead be prevented from further movement along the tracks. Accordingly, there is provided on one of the trolleys (the left one, 16l) a friction brake (generally 26: best seen in Figure 3). This brake comprises a ceiling-engaging friction pad (31) on the end of a rod (32) slidably mounted in a sleeve (33) secured to the trolley and spring-loaded (in

this case by a compression spring 34) away from ceiling engagement. However, when the bulkhead 13 is raised into its stowed position it physically abuts the lower end (35) of the rod 32, and drives the rod up against the spring 34 so that the pad 31 moves into frictional engagement with the ceiling 15 (not shown in Figure 3). In this way the trolley/bulkhead combination is prevented from moving along the tracks when in its stowed state.

CLAIMS

1. A barrier mounting arrangement useable to adjustably and reversibly partition a volume within a hollow body such as that of a lorry or truck into two smaller volumes spaced along the body, which arrangement comprises:

a track mountable along the ceiling of the body;

a trolley movable in the track, and bearing hinged barrier attachment means to which may be attached the barrier for in-use pivotal movement between a stowed position adjacent and parallel to the ceiling and a deployed position depending from the ceiling and dividing the volume into two; and

gas-strut counter-weight means acting between the trolley and the barrier attachment means and positioned within the depth of the trolley.

2. A mounting arrangement as claimed in Claim 1, wherein the barrier is a bulkhead for use within a lorry or truck body.

3. A mounting arrangement as claimed in Claim 2, wherein the body is a refrigerated truck body, and the bulkhead is disposed within the body so as to partition the available space (into a front part and a rear part), the way in which it is so disposed allowing it not only to be moved along the body, to vary the point at which the body is so partitioned, but also to be swung (up to the ceiling) completely out of the way, so as to leave the body unpartitioned.

4. A mounting arrangement as claimed in any of the preceding Claims, for use with a barrier which is of a size and shape to fit the body, and of a material that

is a sandwich of expanded polystyrene or foamed polyurethane with an impermeable coating on each face.

5. A mounting arrangement as claimed in any of the preceding Claims, for use with a barrier that is a "sealing" fit to the inside surface of the body's walls, floor and ceiling, this fit being achieved by attaching a brush-type sealing strip all round the barrier's perimeter.

6. A mounting arrangement as claimed in any of the preceding Claims, wherein the track is a rectangular section tube with a lengthwise slot, and is intended to be used with a trolley that is mounted thereon via wheels running within the tube and supporting the trolley by a pylon-like leg extending out through the slot.

7. A mounting arrangement as claimed in any of the preceding Claims, wherein there are two tracks, and two separate trolleys, one for each track.

8. A mounting arrangement as claimed in any of the preceding Claims, wherein the attachment means hingedly borne by the (or each) trolley comprises a plate member bent (out of its plane) into an L shape and hinged to the trolley by an axle pin positioned along the length of the L's upright, so providing a flat surface (the L's base) to which the bulkhead is actually attached and a lever arm (the projecting part of the L's upright) to which the gas-strut counterweight means can be secured.

9. A mounting arrangement as claimed in any of the preceding Claims, wherein there is one gas strut per trolley, which strut is positioned within the depth of the trolley.

10. A mounting arrangement as claimed in any of the preceding Claims, wherein there is provided lock means

whereby, when stowed, the bulkhead may be securely but releasably locked to the trolley.

11. A mounting arrangement as claimed in Claim 10, wherein the lock means is a slamlock.

12. A mounting arrangement as claimed in either of Claims 10 and 11, wherein there is a lock means per trolley.

13. A mounting arrangement as claimed in any of the preceding Claims, which includes trolley securing means in the form of a friction brake mounted on the trolley and operatively engageable with the ceiling or track but biassed out of engagement therewith, which brake is drivable by the barrier into engagement against the bias when the barrier is raised into its stowed position.

14. A mounting arrangement as claimed in Claim 13, wherein the friction brake incorporates a brake pad mounted on the end of a rod that is movable lengthwise in a sleeve but is biassed, by a spring mounted between the rod and sleeve, to that end of its travel that brings the pad nearest the sleeve, and the rod's free end - the end not carrying the brake pad - projects down from the trolley into contact with the bulkhead (when stowed), and is thus pushed up against the spring to bring the pad into frictional contact with the ceiling (or track).

15. A mounting arrangement as claimed in any of the preceding Claims and substantially as described hereinbefore.

16. A lorry or truck body that is partitioned using one or more barrier mounting arrangement, and/or a friction

brake apparatus, as claimed in any of the preceding Claims.

17. Friction brake apparatus as defined in any of Claims 13 to 15.

18. Friction brake apparatus as claimed in Claim 17 and substantially as described hereinbefore.

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