This invention relates to railway cars and particularly to an improved lading barrier or bulkhead structure for freight cars and similar lading carrying vehicles. While the device is shown and described as particularly suitable for cars used in shipping or transporting granular or powdered lading such as china clay, cement, grain and the like, it is also adapted for use with other types of lading or as a partition dividing the car into compartments.

Certain objections to various types of lading retaining bulkheads now in use include lack of means for positively maintaining the bulkhead in lading retaining position, especially in transit, complicated or laborious operation, complicated structure or mechanism, etc. In the shipment of lading such as china clay and the like, a temporary bulkhead is sometimes erected which has to be torn down before unloading the car, involving possible damage to the car in addition to cost of labor and materials.

It is an object of the present invention to provide a lading barrier or bulkhead structure of relatively simple construction and easy and quick to operate.

A further object is to provide such a structure having a plurality of vertically slideable sections and means for operating the same, which means shall not include counterweights or other balance means.

Another object of the invention is the provision of a multi-section structure of the type described in which the individual bulkhead sections are positively held down in operative position to insure the lading being properly retained in transit.

Still another object of the invention is to provide a structure as above described in which raising of the lowermost bulkhead section by shiftable hoist or similar means raises all sections together in a single operation to a side-by-side elevated inoperative position. As the sections of the bulkhead of the invention are arranged in stepped relation to one another in the down or operable position, the raising of the sections will be accomplished with less friction between the lading and the lading retaining surfaces of the individual bulkhead sections than would occur with the raising of a single section bulkhead, and access to the lading at various heights above the floor, corresponding to the raised heights of each section, will be available.

A further object of the invention is to provide a structure as above described in which the lading retaining surfaces of the bulkhead sections are sloped downwardly and outwardly to reduce friction of the lading therefore against being raised, thus easing operation of the bulkhead.

These and other objects of the invention will be apparent to those skilled in the art from a study of the following description taken with the accompanying drawings in which:

Fig. 1 is a partial longitudinal vertical sectional view through a railway freight car showing the lading barrier or bulkhead structure as used at opposite sides of the side doorway, the structure on the left being shown in the down position and that on the right in partially raised position;

Fig. 2 is a fragmentary transverse sectional view through the car showing the structure in the down position across the car with a small portion thereof broken away to better disclose the same;

Fig. 3 is a cross sectional view taken on the line 3-3 of Fig. 2;

Fig. 4 is a cross sectional view taken on the line 4-4 of Fig. 3;

Fig. 5 is a side elevation view showing in the down position a modified form of the structure with in which the lading retaining surfaces of the bulkhead section are downwardly and outwardly for the purpose hereinbefore mentioned;

Fig. 6 is a schematic view showing the modified structure in partially raised position, and

Fig. 7 is a view similar to Fig. 2 showing the modified structure in the fully raised position.

Referring now more in detail to the drawings, the lading barrier or bulkhead structure generally designated A is shown in Fig. 1 as installed in a box or similar freight car B having a roof C and floor D. The bulkhead structure extends transversely of the car and is as located at opposite sides of side doorways E, only one of which is shown, although but one structure may be used and in any other desired location in the car. The side door posts F of the car, as more clearly shown in Figs. 3, 4, are channels each having a web 8 and inwardly-directed flanges 10. Angles 12, 13 secured by rivets 14 or other suitable means to the channel web 8 divide the channels into a plurality of vertical guideways 16, 18, 20. Guideway 16 is defined by the channel web 8, one flange 10 and leg 22 of angle 12, while guideway 18 is defined by angle legs 22 and 23 as well as by the channel web and the attaching flange of angle 12. In a like manner, guideway 20 is defined by angle leg 23 and channel flange 10 as well as by the channel web and the attaching flange of angle 13.

A multi-section bulkhead made up of lower, middle and upper bulkhead sections 24, 26, 28, respectively, extends between and is slidable arranged, respectively, in pairs of opposite guideways 16, 18, 20. The bulkhead may comprise any desired number of sections with a corresponding number of guideways, each section being formed in the instance shown by spaced sheet metal panels 30 connected together by top and bottom channel members 32 and end channel members 34 positioned in the respective guideway. The bulkhead sections are reinforced by intermediate Z bars 36 and provided with pairs of top and bottom anti-friction rollers 38 extending from the ends and with their axes extending transversely of the section and also provided with similar rollers 40 extending from the sides of the sections with their axes at right angles to the rollers 38. The rollers 38 extending from the ends are carried between spacers 42 by pins 44 journaled in the flanges of side channel members 34 and secured by cotter pins 46. The rollers 40 extending from the sides are carried between a spacer 48 and plate 50 welded to the channel member flanges by pins 52 journaled in the plate 50 and web of the channel members 34 and secured by cotter pins 54. As will be understood, the rollers 38 project beyond the ends while rollers 40 project beyond the sides of the bulkhead sections for riding in their respective guideways during raising and lowering of the bulkhead sections, with the lower section 24 thereof in guideways 16, the middle section 26 in guideways 18 and the upper section 28 in guideways 20.

The bulkhead sections are supported in stepped relation to each other when in the down position with the lowermost section 24 supported on floor D of car B and with the middle and upper sections 26 and 28 respectively supported by angles 56 welded to angles 12 and 13 respectively, angles 56 thus being immovably positioned in and projecting into
guideways 18, 20. It may be noted here that the guideway angles 12 extend the full length of channel posts F since they form part of the guideway for the lower bulkhead section, while angles 13 extend approximately only three-fourths of the length to form part of the guideway for both middle and upper bulkhead sections. Welded to the top of each bulkhead section adjacent the ends are one or more laterally extending members in the form of inverted T bars 58 located in staggered relation. The projections on the middle and upper sections have laterally outwardly projecting portions overlying or extending in overlapping relation to the adjacent lower section and are engageable by the top of the next lower section during raising of the sections. For example when the lowermost section 24 is raised its top will engage the outwardly projecting, overlying portion of the bar 58 on the middle section 26 and the two sections then move together until the top of 26 engages the bar 58 of section 28 after which all three sections move in unison to a position adjacent the car roof C. The bars 58 of all sections except the topmost have laterally inwardly projecting portions overlapping horizontally the angle bars 60 to be described. Abutment means in the form of angle bars 60 are welded to the lower edge portion of the middle and upper bulkhead sections 26, 28. These angle bar abutments extend laterally outwardly from their respective sections and are engaged by the adjacent projection 58 of the overlapping top edges of the lowermost and middle bulkhead sections respectively, whereby the middle and the upper section are positively held down against their respective supports 56 by the next lower section when the bulkhead is in the down position. The lowermost bulkhead section 24 is releasably locked in down position by a key pin 62 extending through key slots in guideway channel flanges 10, spaced section panels 30 and leg 22 of guideway angle 12 thereby locking all sections. The bulkhead sections are thus firmly secured in lading retaining position, which is important especially when the car is in transit and the sections subjected to jolting and jarring forces tending to separate them with consequent undesirable leakage of lading.

Extending between and secured to the upper ends of channel posts F are transverse support beams 64 connected intermediate their ends by a longitudinally extending rail member 66. A shiftable hoist 68 carried by rollerson 70 riding on the rail member 66 is movable above the side doorways E between opposite bulkheads. The hoist 68 is provided with a lift chain 72 having a hook 74 for connection to bail or other suitable means 76 welded centrally to the top of the lowermost bulkhead section 24 and is operated by pull cables 78. The hoist may thus be selectively connected to the lowermost section of either bulkhead to raise the same, the top of the sections successively engaging the projections on top of the next upper section whereby all sections are finally raised together in a single operation and releasably locked in side-by-side elevated position by insertion of key pin 62 in an upper key slot 80 similar to the lower key slot previously described.

The modified form of the invention shown in Figs. 5, 6, 7 is the same as previously described for the sloping lading retaining surfaces of the bulkhead sections indicated at 82. It will be seen that these surfaces have been sloped downwardly and outwardly in a direction toward the car floor, thus reducing friction of the lading L thereon against while being raised and easing operation of the bulkhead.

The invention may be modified in various respects as will occur to those skilled in the art and the exclusive use of all modifications that come within the scope of the appended claims is contemplated.

What is claimed is:

1. In a lading barrier structure for a railway car having a floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of guideways being adjacent and longitudinally spaced in opposing walls of the car, an extensible bulkhead comprising a plurality of sections, each of said sections having an outer surface and an inner lading retaining surface, the ends of each one of said sections being slidably arranged in one said set of said oppositely arranged vertical guideways, immovable means projecting into said vertical guideways, said immovable means in any one set of vertical guideways being longitudinally and vertically spaced from said immovable means in any other set of vertical guideways to support said bulkhead sections by their lower edges in stepped relation to each other with the upper edge of each lower section overlapping in a vertical direction the lower edge of each adjacent section on the car floor surface thereof when said bulkhead is in the down position with the lowermost section supported on the car floor, and means on said upper bulkhead sections projecting laterally outwardly therefrom in the direction of and in overlapping relation to the next lower section and engageable by the top of the next lower section when the lowermost bulkhead section is raised to first successively and then together raise said bulkhead sections to a side-by-side elevated position.

2. In the lading barrier structure of claim 1 wherein said inner lading retaining surfaces slope downwardly and outwardly toward the car floor for reducing friction between said lading retaining surfaces and lading when said bulkhead is raised.

3. In a lading barrier structure for a railway car having a floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of vertical guideways being adjacent and longitudinally spaced in opposing walls of the car, an extensible bulkhead comprising a plurality of sections, each of said sections having; ends, upper and lower edges, an outward surface and an inner lading retaining surface, the ends of each one of said sections being slidably arranged in one said set of said oppositely arranged vertical guideways, support means in said vertical guideways, said support means in any one set of vertical guideways being longitudinally and vertically spaced from said support means in any other set of vertical guideways to support said bulkhead sections by their lower edges in stepped relation to each other with the upper edge of each lower section overlapping in a vertical direction, the lower edge of each adjacent upper section on the outward surface thereof when said bulkhead is in the down position with said lowermost section supported on the car floor, means for releasably locking said lowermost bulkhead section in said down position, and interengaging means on adjacent overlapped upper and lower edges of said bulkhead sections for holding said upper sections against their respective support means when said bulkhead is in the down position.

4. In the lading barrier structure of claim 3 wherein said inner lading retaining surfaces slope downwardly and outwardly toward the car floor for reducing friction between said lading retaining surfaces and lading when said bulkhead is raised.

5. In a lading barrier structure for a railway car having floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of vertical guideways being adjacent and longitudinally spaced in opposing walls of the car, an extensible bulkhead comprising a plurality of sections, each of said sections having; ends, upper and lower edges, an outward surface and an inner lading retaining surface, the ends of each one of said sections entering and slidably arranged in one set of said oppositely arranged vertical guideways, support means in said vertical guideways, said support means in any one set of vertical guideways being longitudinally and vertically spaced from said support means in any other set of vertical guideways to support said bulkhead sections by their lower edges in stepped re-
lation to each other with the upper edge of each lower section overlapping in a vertical direction the lower edge of the next lower adjacent section when the lowermost section thereof when said bulkhead is in the down position with the lowermost section on the car floor, means fixed on the upper edge of each of said sections, means on the upper edges of the upper sections projecting laterally outward therefrom so as to overlap horizontally the next lower section and being engageable by the upper edge of the next lower adjacent section when the lowermost section is raised to first successively and then together raise said sections to a side-by-side elevation position, further means fixed on the upper edge of each of said sections except the topmost section, said further means projecting laterally in the direction of the adjacent higher section, and abutment means on the lower edges of said upper sections underly ing and engageable by said further means whereby to hold down said upper sections against said support means when said bulkhead is in the down position.

6. A lading barrier structure for a railway car having a floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of guideways being arranged in side-by-side relationship in opposite walls of the car, an extensible multisection bulkhead comprising a plurality of bulkhead sections each of said sections having ends, upper and lower edges, an outward surface and a lading retaining surface, the ends of each one of said sections being slidably arranged in one set of said side-by-side oppositely arranged vertical guideways, support means in said guideways, said support means in means in any one set of oppositely arranged vertical guideways being longitudinally and vertically spaced from said support means in any other set of oppositely arranged vertical guideways to support the bulkhead sections by their lower edges in stepped relation to each other with the edge of each lower bulkhead section overlapping in a vertical direction the lower edge of each adjacent upper bulkhead section when said bulkhead is in the down position with the lowermost section thereof supported on the car floor, bar means fixed on the top of said bulkhead sections and having portions certain of which project laterally outwardly from the respective sections in the direction of the next lower section and overlie the same and are engageable by the top of the next lower section when the lowermost bulkhead section is raised to first successively and then together rise said bulkhead sections to a side-by-side elevated position, certain other portions of said bar means projecting laterally from the respective sections in the direction of the next higher section, and abutment means on the upper bulkhead sections underlying said other portions and engageable by the same to hold down said upper sections against their respective support means when said bulkhead is in the down position.

7. In a lading barrier structure for a railway car having a floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of guideways being arranged in side-by-side relationship in opposite walls of the car, an extensible bulkhead comprising a plurality of sections having; ends, upper and lower edges, an outward surface and an inner lading retaining surface, the ends of each one of said sections being slidably arranged in a set of said guideways, a plurality of means arranged in said guideways in stepped relation to one another for extending under and supporting said bulkhead sections in stepped relation with the upper edge of each lower section overlapping in a vertical direction the lower edge of the next higher section, and in position to be engaged by the top of the next lower section when said bulkhead is in the down position with the lowermost section thereof supported on the car floor, means projecting outwardly from each of said sections except the lowermost section and in position to be engaged by the top of the next lower section when said bulkhead is in the down position with the lowermost section and in position to be engaged by the top of the next lower section when said bulkhead is raised to first successively and then together rise said sections to a side-by-side elevated position, and means associated with said guideways and said lowermost section for releasably supporting said bulkhead in said elevated position.

8. In a lading barrier structure for a railway car having a floor supporting opposing walls and door posts defining opposite side doorways in said opposing walls, said door posts formed to provide opposing guideways, a pair of extensible bulkheads, one of said extensible bulkheads on either side of the doorways, said extensible bulkheads comprising a plurality of sections extending between and slidably arranged in opposing guideways on either side of said doorways, each said section having; upper and lower edges, an outward surface and an inner lading retaining surface, a plurality of support means arranged in the guideways on either side of the doorways in stepped relation to one another for extending under and supporting said bulkhead sections of each said bulkhead in stepped relation with the upper edges of lower sections overlapping in a vertical direction the lower edges of adjacent upper sections when said bulkheads are in the down position with the lowermost section supported on the car floor, support members extending crosswise of the car connecting the upper portions of opposite door posts, a longitudinally extending rail member connecting the intermediate portions of said support members, means on the sections of each bulkhead except the lowermost section projecting laterally outwardly from the respective section in the direction of the next lower section and overlapping the same and engageable by the top of the next lower section when the lowermost bulkhead section is raised to first successively and then together rise said sections of each bulkhead to a side-by-side elevated position, and shiftable hoist means supported on said rail member adapted to be selectively connected to the lowermost section of either of said bulkheads for raising and lowering the latter to and from said elevated position, said means on said sections of each bulkhead except the topmost further projecting laterally inwardly toward the next adjacent higher section and means on the lower edges of each higher section underlying and engageable with said laterally inwardly projecting means for holding down said sections against said plurality of support means.

9. A lading barrier structure for a railway car having a floor supporting opposing walls, a plurality of sets of oppositely arranged vertical guideways, said sets of guideways being oppositely arranged and longitudinally spaced on opposite walls of the car, an extensible bulkhead comprising a plurality of sections, each of said sections having; ends, upper and lower edges, an outward surface and an inner lading retaining surface, said ends of each one of said sections being slidably arranged in one set of said oppositely arranged vertical guideways and an extensible bulkhead.
having a plurality of sections, said bulkhead having a down position in which the lowermost section rests on a floor and the sections are in stepped relation to each other with the upper edge of each lower section overlapping in a vertical direction the lower edges of each upper section, said bulkhead further having an elevated position in which each section is elevated above the position it occupied in the down position of the bulkhead and in which the sections are side by side and substantially in vertical coincidence, the improvement comprising the combination with the above of means extending under and abuttingly supporting each section except the lowermost in the down position of the bulkhead, each section further having immovably affixed to its top edge a laterally extending bar, the bars of all sections except the topmost having a portion projecting laterally inwardly beyond the section and toward the next higher section, the bars of all sections except the lowermost having a portion projecting laterally outwardly therefrom and in horizontally overlapping relation to the next lower section, and all sections except the lowermost having abutment means adjacent the bottom edge of the section and extending laterally outwardly toward the next lower section beneath the respective inwardly projecting portion of the bar of the adjacent lower section, whereby raising of the lowermost section raises the next higher section by engagement of the top of the lowermost section under the overlapping outwardly projecting portion of the bar of the adjacent section, said last mentioned section similarly raising the next adjacent section, the entire bulkhead thus being raised through raising of the lowermost section, and the upper sections in the down position of the bulkhead being held down against their respective support means by engagement of said inwardly projecting bar portions against said abutment means of the respective next higher section.

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