Nov. 10, 1942. R. A. SHIELDS 2,301,465

FLOOR RACK HINGE MEANS

Filed June 18, 1942

Fig. 1.

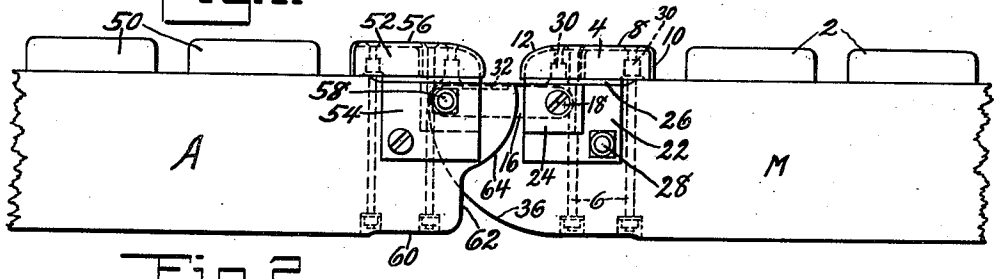


Fig. 2.

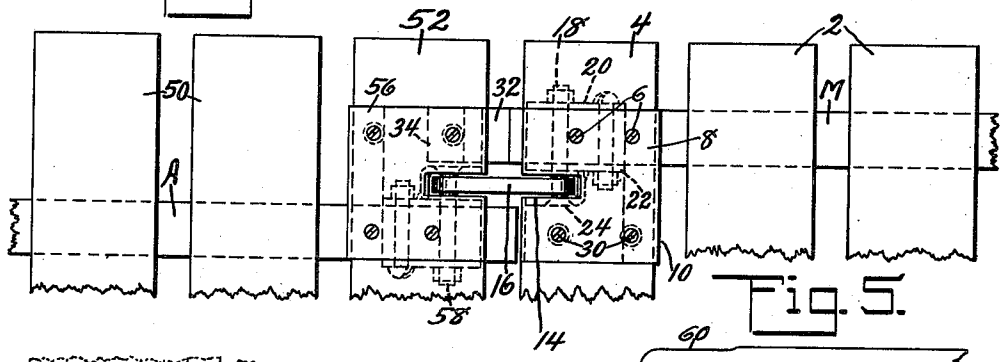


Fig. 5.

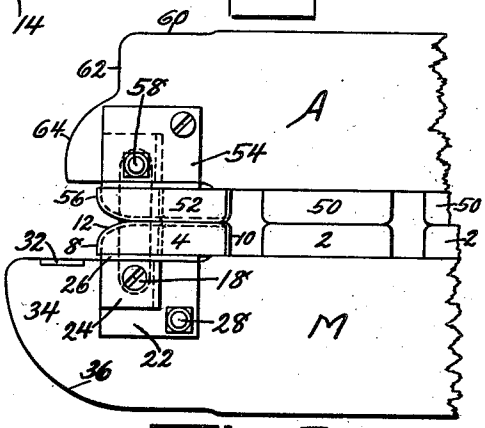


Fig. 4.

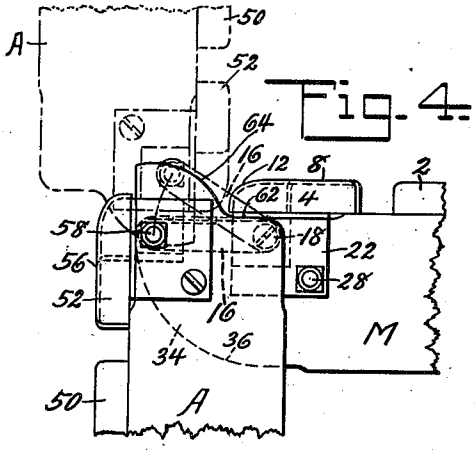


Fig. 3.

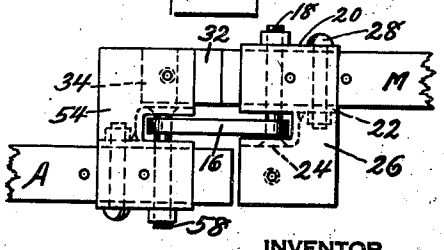
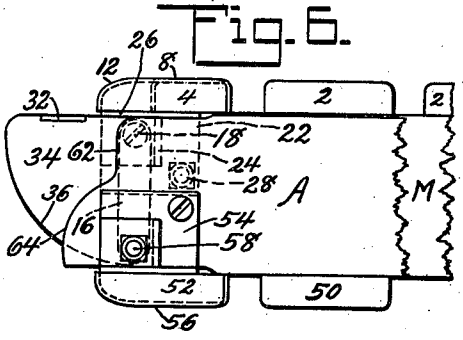


Fig. 6.



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FLOOR RACK HINGE MEANS

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Application June 18, 1942, Serial No. 447,549

8 Claims. (Cl. 105—375)

This invention relates to hinges in general and in particular to hinges for use in connection with floor racks or other means which must preferably swing through an angle of approximately 360 degrees.

In certain railway car constructions, particularly refrigerator cars, a delicate membrane is applied over the car flooring in order to prevent leakage from the car and the contents coming in contact with the supporting floor of the car. The delicate membrane is protected from load contact by means of floor racks which are normally hinged to the car side and swung upwardly against the car side wall to permit cleaning of the delicate membrane floor covering. In order to gain access to the car when the floor racks are folded against the side wall, it is necessary for short or auxiliary sections adjacent the door openings to be capable of swinging back upon the main rack sections. Under certain loading conditions where it is necessary to truck material from a platform through one or more cars, it is necessary that the short or auxiliary rack sections be capable of folding back upon the top of the floor racks when in position on the floor. In other words, the auxiliary racks must be capable of swinging through approximately 360 degrees. Several hinging arrangements for such racks have been proposed but in all cases either the stringers of the auxiliary rack or the hinge element itself would injure the delicate membrane of the floor during swinging of the auxiliary rack back upon the main rack when in floor contacting position. It is an object, therefore, of the present invention to provide a floor rack hinging means in which the auxiliary rack cannot injure the floor surface upon which it is normally supported.

A further object of the invention is the provision of an auxiliary floor rack hinging means so constructed and arranged that the auxiliary rack has a rocking or rolling pivotal contact with the main floor rack.

A still further object of the invention is the provision of hinge means for floor racks in which the auxiliary floor rack pivots or rolls about a point of support on the main floor rack, which point is always outward of the end of the auxiliary floor rack stringers in contact with the floor.

A yet further object of the invention is the provision of floor rack hinging means in which the stringers of the main floor rack are extended to support and control the movements of the auxiliary floor rack.

These and other objects of the invention will be apparent to persons skilled in the art from a study of the following description and accompanying drawing, in which:

Figure 1 is an elevational view of the hinged portion of the floor rack;

Fig. 2 is a plan view of the hinge connection;

Fig. 3 is a detail plan view showing the hinge brackets and connecting means;

Fig. 4 is an elevational view showing the auxiliary floor rack in two partially folded positions, one by full lines and the other by line and dash outline;

Fig. 5 is an elevational view showing the auxiliary rack folded back upon the top of the main rack, and

Fig. 6 is a similar elevational view but showing the auxiliary rack folded back or nested within the main floor rack.

Referring now to the drawing in detail, it will be seen that the main floor rack is formed with stringers M to which are attached load supporting slats 2. It is, of course, understood that the floor rack is made up of a plurality of stringers connected by the transversely extending load supporting slats to form the complete floor rack but since all stringers are identical only one has been shown for purposes of simplicity. As clearly shown in the figures, the main stringers M are extended beyond the end load supporting slat 4. This slat is attached to the main stringer by bolts or other means 6 which extend through the stringer and slat and through a cap like member 8. This cap like member has one edge flanged downwardly as at 10 and the other edge curved as at 12 to conform with the curved outer upper corner of the end load supporting slat. The cap like member has the curved edge thereof slotted as at 14 (Fig. 2) in order that the straight bar hinge element 16 may swing upwardly to a substantially vertical position as shown in Fig. 5. The bar hinge or connecting element 16 is pivotally connected to the main floor rack stringer M upon a pivot pin or bolt 18 extending through the slat and through spaced arms 20, 22 and 24. These spaced arms are connected together by a top plate 26 which underlies, supports and braces the end slat 4 and the arms 20 and 22 are closely engaged and attached to the stringer M by bolt or other means 28, while the inner portion of plate 26 is secured to the slat and cap 8 by means of bolts 30. The peculiarly shaped hinge butt element just described is necessary where a straight connecting pivot bar such as 16 is used. Since the use of such a bar requires hinging of the slat and cap and the slat must be reinforced to compensate for the cut out material, it will,

of course, be obvious that if an offset hinge element is utilized the slat 4 need not be notched and can be fastened to the main stringer exactly as were the other slats. As clearly shown in Figures 1, 5 and 6, the top surface at the end of stringer M is cut away slightly an amount equal to the thickness of slat supporting plate 26 forming a part of the hinge butt element. Also this upper cut away portion is notched to receive a small bearing plate 32 having its top surface substantially flush with the top surface of the cut away portion and for a purpose later to be described. In normal floor rack construction the main stringers would be cut off even with the edge of the end slat, but as clearly shown in the present instance they are extended a considerable distance beyond the end slat 4 to provide the extended portion 34 carrying the above mentioned bearing plate 32 and having the end and lower portion curved as at 36 substantially concentric with pivot 18.

The auxiliary floor rack is like the main floor rack formed with a plurality of spaced stringers A, one of which is shown, however, and these spaced stringers are connected by load supporting slat 50, the end one of which is designated at 52. This end slat 52 is substantially identical to end slat 4 of the main floor rack and is supported and connected to the stringers A by the same type of hinge butt 54 and cap 56 as was described in connection with the main floor rack, therefore, detailed description will not be given. The auxiliary floor rack is connected to the main floor rack through its hinge butt and through pivot 58 extending through the hinge butt and through the end of hinge bar element 16. The hinged end of the auxiliary stringers A have the bottom portion relieved slightly as at 60, with this relieved portion merging into a substantially vertically extending part 62 which in turn merges into a curved part 64 curved substantially concentric with pivot pin 58. As clearly shown in Figs. 1 and 2, the auxiliary stringers A do not extend sufficiently to underlie the slat 4 of the main section but terminate so as to be able to swing past the outer edge of the end slats 4.

The operation of the floor racks is as follows, assuming the parts to be in the position shown in Figs. 1 and 2: An operator lifting upon the free end of auxiliary rack A will immediately cause the front or outer edge of cap 56 on slat 52 to contact bearing plate 32 of the main rack stringer extension 34. Continued movement of the auxiliary rack will bring it to the position shown in line and dash in Fig. 4. During this entire motion from the position of Figs. 1 and 2 to the line and dash position of Fig. 4 the auxiliary rack has rolling pivotal contact with bearing plate 32 and the hinge or bar elements 16 merely connect and prevent separation of the racks. During continued motion from the line and dash position of Fig. 4 to the full line position of Fig. 5 the cap 56 comes in contact with and rocks upon cap 8 of the main rack. Thus it will be seen that the point of contact or support of the auxiliary rack with the main rack progressively changes from bearing plate 32 to slat cap 8 and the elements 16 act merely as connectors permitting the pivotal motion. The action would be the same if an offset hinge element were used in place of the straight element 16. During reverse movement of the auxiliary rack from the position of Fig. 5 to that of Fig. 1 the auxiliary rack will roll or pivot first upon the caps and then cap 56 will roll or pivot upon the bearing plate 32. It will be seen that the point of contact between the auxiliary rack and the extended stringer of the main rack is at a point outward of the end of the auxiliary rack stringer which might come in contact with the car floor and, therefore, there can be no injury of the car floor since the stringer A can never contact the floor during swinging. When the main and auxiliary racks are folded up against the car side the slats are in contact with the car walls and the auxiliary rack can then be swung only toward a nested position with respect to the main rack. In swinging from the full line position of Fig. 1 to the full line position of Fig. 4 the under surface of slat 52 of the auxiliary rack rocks around the rounded upper nose part of the main stringer extension 34. The rack is held in this position and constrained to such motion by means of the bar or pivot element 16. During movement from the full line position of Fig. 4 to the full line position of Fig. 6 the under surface of slat 52 of the auxiliary rack slides along the curved surface 36 of the main rack stringer extension being held in place by bar or hinge element 16. To permit of the swinging from the full line position of Fig. 4 to the full line position of Fig. 6, it is necessary that the stringers A have a part thereof cut to provide the vertical part 62. In other words, when the vertical part 62 contacts the under surface of slat 4, the sliding motion between slat 52 and curve 36 is the only motion that can take place and the auxiliary rack is thus forced to follow the desired motion. During reversal or movement from the position of Fig. 6 to the position of Fig. 1 the motion will be the same as that previously described until the auxiliary rack reaches the full line position of Fig. 4. In swinging the rack from the full line position of Fig. 4 to that of Fig. 1 the curved part 64 of the auxiliary rack stringers contacts the forward face of cap 8 and guides and controls the motion of the auxiliary rack until it can assume the full line position of Fig. 1.

While the invention has been described more or less in detail with specific reference to the drawing, it will be obvious to persons skilled in the art that various modifications and rearrangements of parts may be made without departing from the scope of the invention as defined by the following claims.

What is claimed is:

1. Hinging means for floor racks comprising, a pair of aligned floor racks each formed with spaced stringers normally resting on a car floor, transversely extending load supporting slats secured to said stringers, and hinge elements pivotally connecting adjacent stringers for relative swinging movement, one slat of one of said pair of aligned floor racks resting upon the stringers of the other one of said pair of aligned floor racks and serving as a pivot means during at least a part of the relative swinging movement of said racks.

2. Hinging means for floor racks comprising, a pair of aligned floor racks each formed with spaced stringers normally resting on a car floor, transversely extending load supporting slats secured to said stringers, and elements connecting adjacent stringers of adjacent racks for relative swinging movement, one slat of one of said pair of aligned floor racks resting upon the stringers of the other one of said pair of aligned floor racks, said one slat serving as a pivot means during at least a part of the relative swinging movement of said racks.

3. Hinging means for floor racks comprising, a pair of aligned floor racks each formed with spaced stringers normally resting on a car floor, transversely extending load supporting slats secured to said stringers, and elements connecting adjacent stringers of adjacent racks for relative swinging movement, one slat of one of said pair of aligned floor racks resting upon the stringers of the other one of said pair of aligned floor racks, said one slat providing a shifting pivot upon which one of said racks turns during the relative swinging movement of said racks.

4. Hinging means for floor racks comprising, a main floor rack and an auxiliary floor rack, each of said racks being formed with spaced stringers normally resting on a floor, transversely extending load supporting slats secured to said spaced stringers, the stringers of said main floor rack being extended in overlapping relation with the stringers of said auxiliary floor rack and underlying the adjacent end slat of said auxiliary floor rack, and means connecting the adjacent stringers of said racks together to prevent separation while allowing relative swinging movements thereof, said end slat of said auxiliary floor rack rocking upon the extended stringers of said main floor and serving as a moving pivot during the relative swinging movement of the racks.

5. Hinging means for floor racks comprising, a main floor rack and an auxiliary floor rack, each of said racks being formed with spaced stringers normally resting on a floor, transversely extending load supporting slats secured to said spaced stringers, the stringers of said main floor rack being extended in overlapping relation with the stringers of said auxiliary floor rack and underlying the adjacent end slat of said auxiliary floor rack, and means connecting the adjacent stringers of said racks together to prevent separation while allowing relative swinging movements thereof, said end slat of said auxiliary floor rack progressively rocking upon the extending stringers and end slat of said main floor rack during swinging of the auxiliary floor rack relative to the main floor rack.

6. Hinging means for floor racks comprising, a main floor rack and an auxiliary floor rack, each of said racks being formed with spaced stringers normally resting on a floor, transversely extending load supporting slats secured to said spaced stringers, the stringers of said main floor rack being extended in overlapping relation with the stringers of said auxiliary floor rack and underlying the adjacent end slat of said auxiliary floor rack, and means connecting the adjacent stringers of said racks together to prevent separation while allowing relative swinging movements of approximately 360 degrees, said end slat of said auxiliary floor rack contacting the extended stringers of said main floor rack and guiding the movements of said auxiliary floor rack during its swinging movements relative to said main floor rack.

7. Hinging means for floor racks comprising, a pair of aligned floor racks each including spaced stringers normally resting on a car floor, elements connecting adjacent stringers of the adjacent racks for relative swinging movements, the stringers of one of said pair of floor racks being formed with extended portions, and means secured to the stringers of the other one of said pair of floor racks and rocking on said extended portions, said means providing a shifting pivot point about which said other one of said pair of floor racks swings during relative swinging movement of said racks.

8. Hinging means for floor racks comprising, a pair of aligned floor racks each including spaced stringers normally resting on a car floor, elements connecting adjacent stringers of the adjacent racks for relative swinging movements of approximately 360 degrees, extended portions formed on one of said pair of floor racks, and means secured to the stringers of the other one of said pair of floor racks and contacting said extended portions and guiding the swinging movements of said other one of said floor racks.

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