Sept. 8, 1936. H. SCHROEDER 2,053,638

BRACING MEANS FOR CASE LADINGS

Filed Oct. 5, 1935 2 Sheets-Sheet 1

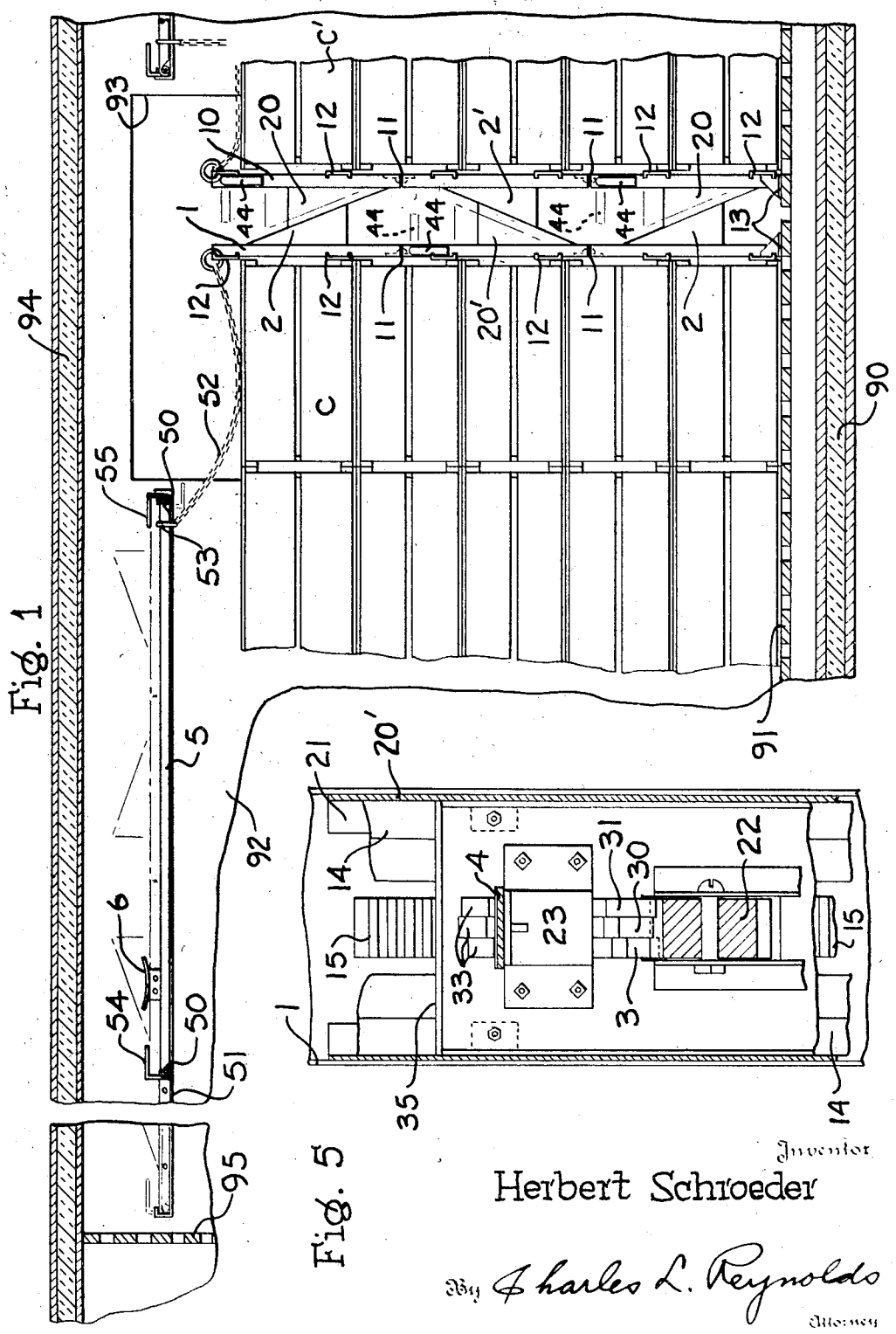


Fig. 1

Fig. 5

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Sept. 8, 1936. H. SCHROEDER 2,053,638

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Filed Oct. 5, 1935 2 Sheets-Sheet 2

Fig. 3

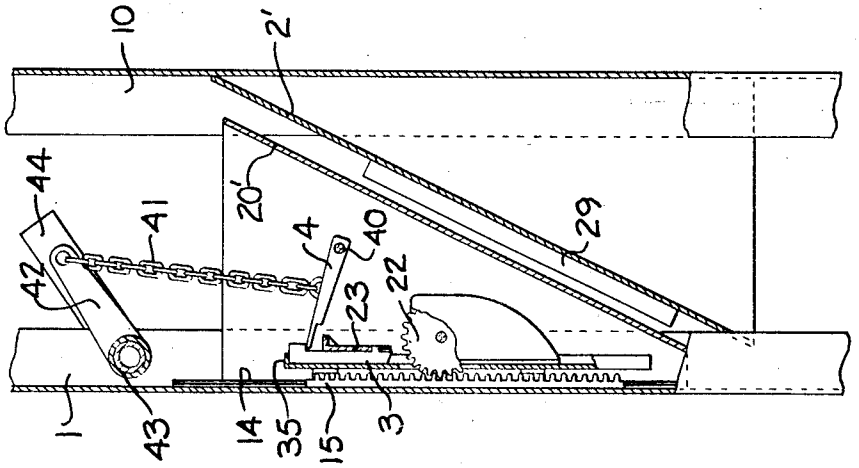


Fig. 2

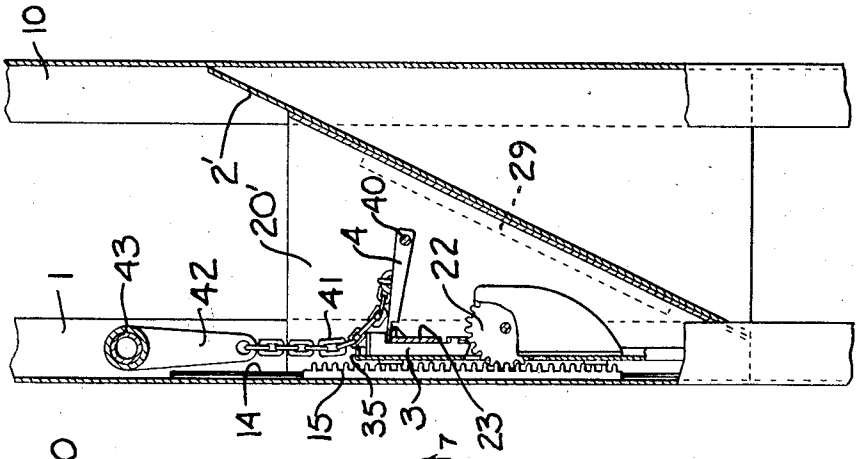


Fig. 4

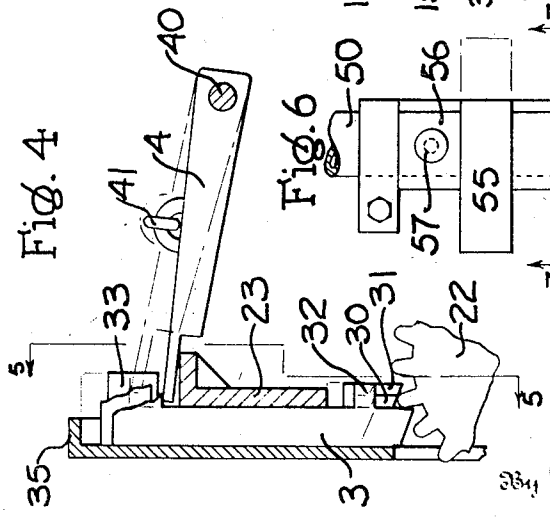
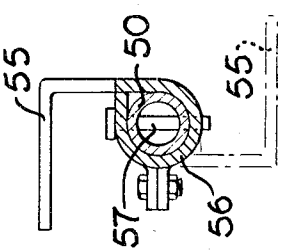


Fig. 6

Fig. 7



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BRACING MEANS FOR CASE LADINGS

Herbert Schroeder, Seattle, Wash.

Application October 5, 1935, Serial No. 43,696

14 Claims. (Cl. 105—369)

My invention relates to bracing means whereby case ladings in cargo carriers, for example in box or refrigerator cars, can be braced and made secure against shifting, and whereby the bracing means will be self-adjusting for any shifting in the lading during transit, or accumulating from small spaces left when the car is loaded. The present invention is an improvement upon the structure disclosed in my copending application Serial No. 745,217, filed September 24, 1934, now Patent No. 2,022,325, issued November 26, 1935.

One of the difficulties in the bracing means of my former application lay in the fact that the forces developed were so great that cooperating wedges, intended to force the parts of the lading apart and hold them in spaced-apart relation, had to be so heavy, because of the reliance upon the weight of a sliding wedge to overcome the friction between the two cooperating wedges, that the device became clumsy and difficult to handle, both in respect to the wedges themselves and with respect to the brace members as a whole, which have to be moved into overhead racks when not in use. It is therefore one of the objects of the present invention to devise such brace means, including cooperating wedges, which may be constructed more lightly, and which will not rely on the weight of a sliding wedge to hold it in position, but which instead is provided with positively locking means which will permit the sliding wedge to move downward, but will positively prevent its upward movement in response to pressure from the lading.

It is a further object to provide such locking means which will take up small increments of movement, such as will occur during weaving of the car in transit, and will hold these small increments against accidental reverse movement of the wedge, yet which can be released readily when desired.

It is a further object to provide means to release the various wedge members, which may be conveniently operated from a point just inside the door of the car, and which will not require reaching into the center of the car to release a wedge. Furthermore, it is an object to provide means for releasing the wedges whereby each pair of wedges, or two connected pairs, may be released independently of all others.

A further difficulty that developed in the use of the bracing means of my former application was that if the wedges held against retrograde movement, the pressure from the lading was sometimes sufficiently great to force the brace means as a whole upward away from the floor, and it is an object of the present invention to compensate for any tendency to move the bracing means as a whole upwardly, by introducing a tendency to move each bracing means downwardly, so that neither one of the two cooperating bracing means can be moved upwardly away from contact with the floor.

It is a further object to provide such bracing means and storage racks for the same, whereby the bracing means can be better moved out of the way when not required, and preferably of such character that the bracing means can be moved to the ends of the car, leaving the greater part of the cargo space in the center of the car free from any impaired overhead clearance.

It is a further object to improve the structure mechanically and in details, all as will appear hereafter.

My invention comprises the novel bracing means, the novel rack support for the same, and the novel parts and combinations thereof, all as shown in the accompanying drawings, described in this specification, and as will be more particularly defined by the claims which terminate the same.

In the accompanying drawings I have shown my invention embodied in a representative form as now preferred by me.

Figure 1 is a section taken longitudinally of a loaded car, just inside the near side wall, showing my bracing members in operative position.

Figure 2 is in part an elevation and in part a vertical section through parts of two cooperating brace members and a pair of cooperating wedges, shown in operative position, and Figure 3 is a similar view showing the wedges during the course of their separation.

Figure 4 is an enlarged section through the ratchet means and cooperating parts.

Figure 5 is a section, substantially on the line 5—5 of Figure 4, illustrating the ratchet means.

Figure 6 is a plan view of a hook forming part of the storage rack, and Figure 7 is a section through the same, on the line 7—7 of Figure 6.

The car illustrated is typical refrigerator car construction. While the bracing means may be incorporated in any type of cargo carrier, it is particularly desirable for use in refrigerator cars for the shipment of such commodities as eggs in cases, and such a lading is illustrated. Thus the car comprises the floor or deck 90, the grating or false deck 91, the side wall 92 having a center door 93, the roof 94, and the false end 95. Such a car is of a height where it will conveniently take five tiers of egg cases, illustrated at C and C'. These are loaded into the car so that they abut against each end of the cargo space and substantially against each side wall (though the latter is unimportant), and when finally loaded the lading is divided into two parts, C and C', spaced a few inches apart at the center of the car, opposite the doors. The bracing means must fit in this space between the two parts of the lading, yet must be capable of being placed in that position, in part at least, after the

car has been loaded, and when it is desired to unload the car the bracing means must be of such character that it can be removed and placed upon overhead racks, where it is out of the way of workmen unloading the car.

As in the former application, I prefer that the bracing means be composed of frames which essentially are posts, standing vertically against each end of the separated parts of the lading, though for convenience two such posts may be joined by cross members to constitute a complete bracing member or frame, and preferably, for convenience in handling, two such frames are provided to contact one part C of the lading, one for each side of the car, cooperating with two other such frames placed against the spaced part C' of the lading. Also for convenience in handling it is preferable that each post, and hence each frame, be made of several sections hingedly connected.

Thus the posts are designated 1 and 10, for convenience in distinguishing them, made in sections hingedly connected at 11, and two or more such posts may be connected by the cross members 12. The posts are preferably of channel shape with the channel, in the operative position of the bracing means, facing toward the opposite bracing member. Each post may be provided with a foot 13 forming a means to support the bracing member upon the deck of the car, and in particular to span the spaces between the slats of the grating 91.

Upon one post, for example the post 1, is fixed a wedge 2, and slidably mounted upon the complemental post 10 is a complemental wedge 20. The wedges 2 and 20, comprising a cooperating pair, are slidable relative to one another, and are of such extent in the direction of the length of the car that they will have contact over a considerable area within the extreme limits of the spacing between the two separated parts of the lading. A flange 29 on one wedge of each pair, engages the side of the complemental wedge to prevent relative sidewise movement of the two wedges. Preferably for each pair of complemental posts there are provided two of the fixed wedges 2 inclined in the same direction, with the complemental slidable wedges 20 on the other post, but it is preferred that if a fixed wedge 2 be secured to the post 1 that there be a fixed wedge 2' carried by the complemental post 10, and a slidable wedge 20' carried by the post 1, the wedge 2' being inclined in the opposite direction from the wedge or wedges 2. Any tendency initiated by pressure from the lading, and due to reaction between the wedges 2 and 20, to move the post 10 upwardly, is thus counteracted by the tendency between the wedges 2' and 20' to move the post 10 downwardly, and thus neither of the posts 1 or 10 is permitted to move upwardly from the floor.

It is obvious that the wedges 20 or 20' would have to be heavy if reliance was placed solely upon their weight to overcome friction and to move them downward, and to prevent their rising again, due to stresses arising during weaving of the lading in transit. Accordingly I prefer that the wedges be made as light as is consistent with proper strength, and that reliance be placed on locking means such as a ratchet device, to prevent the slidable wedges from rising Thus in Figures 2, 3, 4 and 5 suitable ratchet means are shown. The posts may be provided with guides 14, and the slidable wedges, 20' for example, may be provided with inturned flanges 21 engageable beneath these guides 14, whereby the sliding wedge may slide lengthwise of the post, that is vertically, when the bracing means is in operative position, but may not be separated from the post by lateral movement of the wedge, so that when in the stored position, shown in dot and dash lines in Figure 1, the sliding wedge cannot fall from the rack and hang below the rack. Between the guides 14 on the posts is secured a rack bar 15, and carried upon each slidable wedge is a pinion 22 enmeshed with the rack bar 15. Supported in a guide 23 for vertical movement under the influence of gravity, when the bracing means is in its operative position, are a plurality of dogs 3, 30 and 31. These dogs engage between the teeth of the pinion 22, but their points are so located that they will engage at fractional parts of the spacing between teeth on the pinion, so that for each fractional advance of the pinion, upon downward movement of the wedge 20 or 20', a new dog will be engaged, and will prevent retrograde movement of the pinion and slidable wedge.

Each of the dogs is provided with a stop lug 32 which, upon raising the dog, will engage the lower end of the guide 23, and their upper ends at the same time engage a flange 35 secured to the wedge, so that by lifting the dogs the guide 23 and the slidable wedge upon which it is carried will likewise be raised. The dogs may be raised by means of a finger 4 pivotally carried at 40 upon the slidable wedge, and engageable beneath projections 33 at the upper end of each dog, as best seen in Figure 3. Movement of the finger 4 is controlled by a chain 41 secured to an arm 42 carried upon a rock shaft 43. This rock shaft is preferably mounted upon the post 1 or 10 above the upper limit of movement of the slidable wedge, and the chain 41 is of such length, with respect to the amount of permitted movement of the slidable wedge and the length of the arm 42, that the dogs will never be lifted within the normal range of movement of the slidable wedge. When it is desired to disengage the two bracing means, however, the rock shaft 43 may be oscillated, for example by means of a handle 44 upon the end of the rock shaft, which may thus be adjacent the door 93 of the car, and upon the chain 41 being drawn taut the finger 4 is raised, raising all the dogs 3, 30 and 31 until their lugs 32 engage the guide 23 and their ends engage the flange 35, whereupon the dogs are all disengaged from the pinion 22, and the entire slidable wedge is drawn upwardly. Preferably the handle 44 is weighted sufficiently that when released it will fall so that parts will return to the position of Figure 2, and the dogs will be automatically reengaged.

By reason of the structure described the bracing means may be lightly constructed, consistent with the strength required, since no part is dependent for gravity in connection with holding the parts of the lading apart, except the small dogs 3, 30 and 31. These might be spring operated, but springs are liable to break, and it is preferred to avoid their use. In consequence it will be easy to lift each brace frame and to place it in the overhead rack when ready to unload the car, or after the first few cases have been removed. This overhead rack may conveniently consist of longitudinal bars 5 connecting transverse bars 50 to carry the bracing frame, consisting of the post 1 or 10 and the cross bars 12, the whole rack 5, 50 being slidably received upon tracks 51 secured to the side walls 92 of the car. A chain 52, secured to a ring 53 slidable along a longitudinal rack mem-

ber 5, secures each bracing member to the overhead rack, and thereby makes the entire device an integral part of the car, as otherwise it would be necessary, under regulations in force, to charge for the bracing means as cargo, when shipping back the empty car, and, too, the bracing means might otherwise be separated from the car and lost. The bracing members, after disengagement of the wedges, may be raised above the lading, and placed section by section in the rack 5, 50, whereupon the rack carrying the bracing member may be slid along the track 51 until the rack and bracing member are stored adjacent the ends of the car, leaving the center space clear and of unobstructed overhead clearance. To prevent the bracing member from jumping out of the rack 5, 50 the rack may be provided at the end distant from the door with a fixed hook 54, and at the inner end of the rack, adjacent the door, there may be provided a hook 55 (see Figures 6 and 7) provided with a sleeve 56, so that the hook 55 may swing about the rack member 50, the sleeve 56 and the rack member 50 being provided with registering holes to receive a locking pin 57, so that the hook 55, after the bracing member has been placed upon the rack, may be swung up to overlie the end of the bracing member and be locked in this position. By the provision of inwardly projecting shoes 6 secured to the side wall 92 of the car and properly located to lie above each section of the bracing member, when in its final stored position, it is made impossible for the bracing member to buckle and thus to contact the roof of the car, or for any wedge mounted thereon to contact with the roof 94, notwithstanding the limited clearance, and as will be evident, means may be provided to prevent lengthwise sliding of the rack 5, 50 from its final stored position.

What I claim as my invention is:

1. Means to brace case ladings, comprising two members each of a height to rest upon the floor and to extend substantially to the top of the lading, one of said members being adapted to be placed against one part of the lading, and the other member to be spaced from the first and placed against another part of the lading which is spaced from the first part, and two pairs of cooperating wedges disposed between the two members, one wedge of one pair of wedges being fixed to a given member and the other wedge of such pair being movable downwardly to hold the members apart, and one wedge of the other pair being fixed to the other member, and the cooperating wedge of this second pair being movable downwardly to hold the members apart, the two pairs mutually counteracting any tendency of the wedges to move one member or the other upwardly.

2. Means to brace case ladings, comprising two members, each of a height to rest upon the floor and to extend substantially to the top of the lading, each of said members being adapted to be placed, in spaced apart relation, against spaced parts of the lading, a wedge inclined in one direction fixed to one member, and a wedge inclined in the opposite direction fixed to the opposite member, below the first-mentioned wedge, and two cooperating wedges each slidable on one of the fixed wedges and reacting against the member opposite, to force the members apart, and to mutually counteract any tendency to raise either member upwardly.

3. Means to brace case ladings, comprising two members, each of a height to rest upon the floor and to extend substantially to the top of the lading, each of said members being adapted to be placed, in spaced apart relation, against spaced parts of the lading, a wedge inclined in one direction fixed to one member, and a wedge inclined in the opposite direction fixed to the opposite member, below the first-mentioned wedge, two cooperating wedges each slidable on one of the fixed wedges and reacting against the member opposite, to force the members apart, and to mutually counteract any tendency to raise either member upwardly, and means permitting downward movement of each slidable wedge, but preventing upward movement thereof.

4. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, pairs of cooperating wedges disposed and reacting between the two members, one wedge whereof is under the influence of a constantly acting force to move it downwardly, while the other is stationary, to exert a constant forcing-apart action between the two members, regardless of the spacing between them, and means operable to prevent upward movement of the movable wedge, but permitting its downward movement.

5. Means to brace case ladings, comprising two members, each of a height to rest upon the floor and to extend substantially to the top of the lading, one of said members being adapted to be placed against one part of the lading, and the other member to be spaced from the first and placed against another part of the lading which is spaced from the first part, two cooperating wedge means disposed between the two members, and one of said wedge means being free to move downward by gravity, and the other being stationary, to exert a constant forcing-apart action between said two members, regardless of the spacing between them, and a flange on one of said wedge means engaging the side of the cooperating wedge means, to prevent sidewise relative displacement of the two cooperating wedge means.

6. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, and a dog carried by the slidable wedge and engageable with the pinion to prevent upward movement of such wedge, but permitting its downward movement.

7. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, and a plurality of dogs carried by the slidable wedge, and engageable in succession, at fractional intervals of the tooth spacing, with the pinion to prevent upward

movement of such wedge, but permitting its downward movement.

8. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, a dog carried by the slidable wedge and engageable with the pinion to prevent upward movement of such wedge, but permitting its downward movement, and means operable from a point distant from said dog, and operatively connected to said dog, to lift the same from engagement with the pinion.

9. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, a dog carried by the slidable wedge and engageable with the pinion to prevent upward movement of such wedge, but permitting its downward movement, and means operable from a point distant from the dog, and operatively connected to the dog, to lift the same from engagement with the pinion, said means being weighted to return to inoperative position, wherein the dog reengages the pinion.

10. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, a plurality of dogs carried by the slidable wedge, and engageable in succession, at fractional intervals of the tooth spacing, with the pinion to prevent upward movement of such wedge, but permitting its downward movement, and a single means operable to raise all said dogs at once from engagement with the pinion.

11. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, cooperating pairs of wedges disposed and reacting between the two members, to exert a constant forcing-apart action between the two members regardless of the spacing between them, one of the cooperating wedges of a pair being fixed to one member, and the other wedge of the pair being slidable vertically of the other member and of the fixed wedge, a rack fixed to the latter member, a pinion enmeshed with said rack and carried by the slidable wedge, a plurality of dogs carried by the slidable wedge, and engageable in succession, at fractional intervals of the tooth spacing, with the pinion to prevent upward movement of such wedge but permitting its downward movement, a rock shaft and an arm thereon disposed on the lading-engaging member, above the slidable wedge, a finger pivotally mounted on the slidable wedge, and engageable with all said dogs to lift them out of engagement with the pinion, and a flexible tension member connecting said arm and finger to lift the latter, and the dogs, upon oscillation of the rock shaft, said flexible member being of such length, with respect to the length of the arm and the travel of the slidable wedge, that it will not be pulled taut during normal downward travel of the slidable wedge.

12. Means to brace case ladings, comprising two members adapted to rest upon the floor, extending upwardly therefrom, in spaced apart relation, in contact with spaced parts of the lading, two wedges oppositely inclined, one disposed above the other and each fixed to a different one of said members, two complemental wedges, each slidably engaged with one of the fixed wedges and with the opposite member, and movable downwardly by gravity to hold the members in spaced apart relation, and by their opposite inclination to counteract any tendency for either member to rise from the floor, ratchet means preventing upward movement of each slidable wedge, but permitting independent downward movement of each, and independent means, each operable at a distance from the corresponding ratchet means, for releasing each of the latter.

13. Means to brace case ladings, comprising two members adapted to rest upon the floor, extending upwardly therefrom, in spaced apart relation, in contact with spaced parts of the lading, two wedges oppositely inclined, one disposed above the other and each fixed to a different one of said members, two complemental wedges, each slidably engaged with one of the fixed wedges and with the opposite member, and movable downwardly by gravity to hold the members in spaced apart relation, and by their opposite inclination to counteract any tendency for either member to rise from the floor, a rack disposed adjacent each slidable wedge, a pinion carried by each such wedge and enmeshed with said rack, a plurality of dogs carried by each slidable wedge, and engageable in succession, at fractional intervals of the tooth spacing, with the pinion to prevent upward movement of the wedge, but permitting its downward movement, and means common to all the dogs of any given wedge, but independent of other wedges, to lift the dogs from engagement with the pinion, and to raise the wedge.

14. Means to brace case ladings, comprising two members adapted to be placed, in spaced apart relation, against spaced parts of the lading, pairs of cooperating wedges disposed and reacting between the two members, one wedge whereof is slidable downwardly under the influence of gravity, while the other is stationary, to exert a constant forcing-apart action between the two members, regardless of the spacing between them, guide means interengageable between the slidable wedge and the corresponding member, to prevent separation thereof by movement other than vertical, and means operable to prevent upward movement of the slidable wedge, but permitting its downward movement.

HERBERT SCHROEDER.