Feb. 26, 1929. C. M. MacCHESNEY ET AL 1,703,495

METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 1

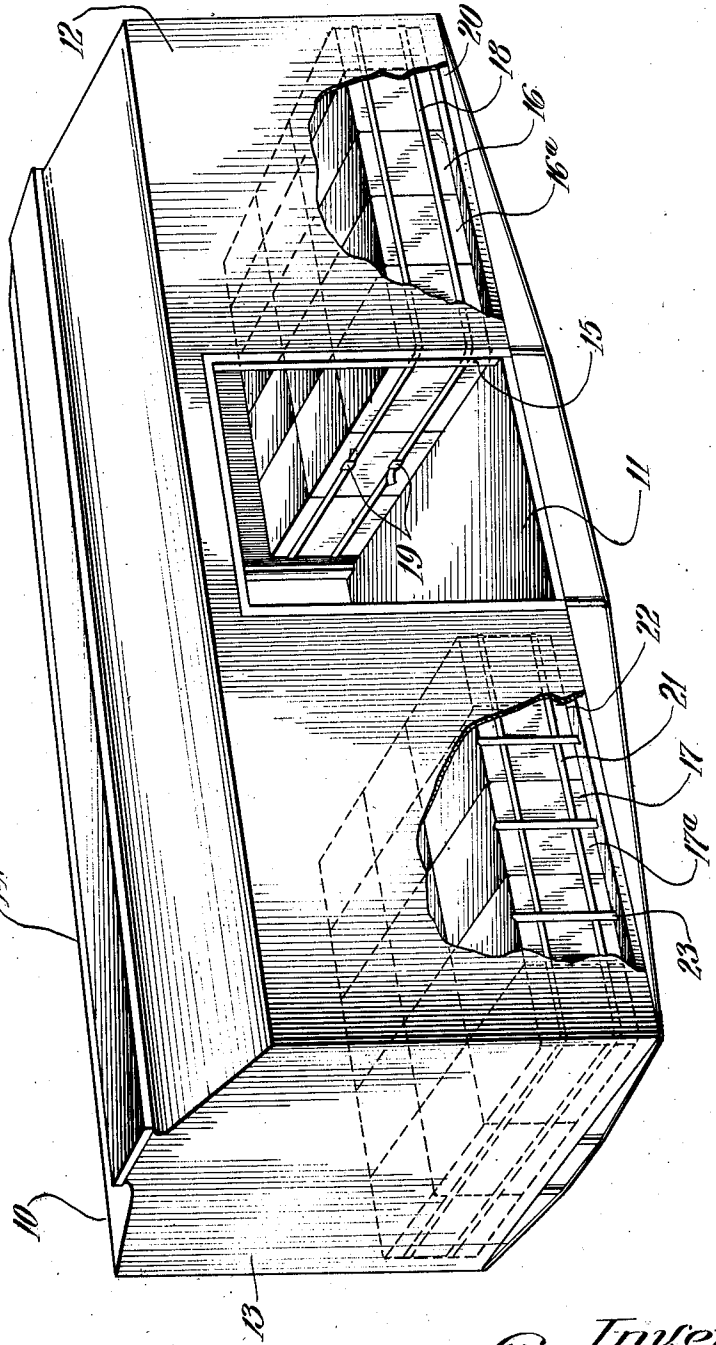


Fig. 1.

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METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 2

Fig. 2.

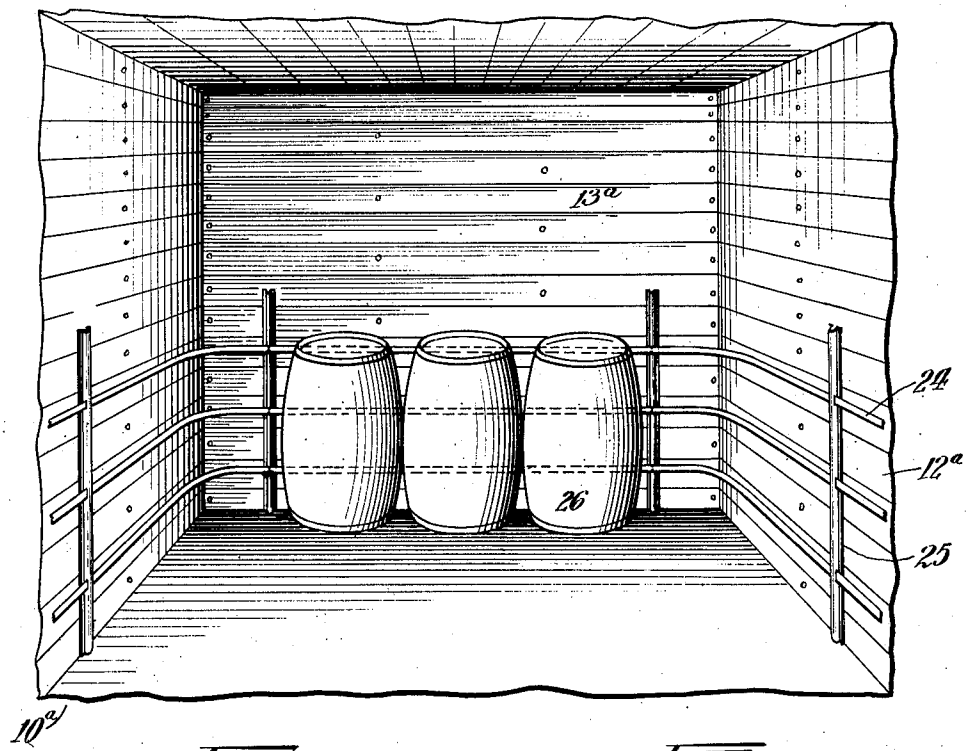


Fig. 3.

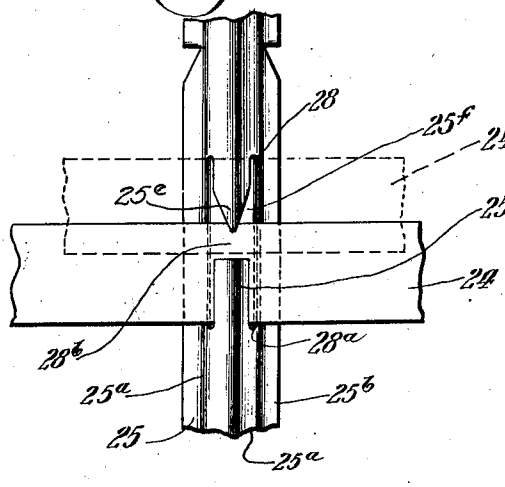
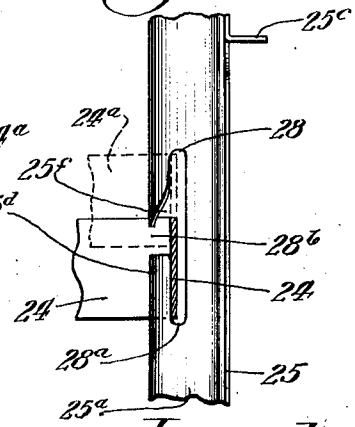


Fig. 4.



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METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 3

Fig. 5.

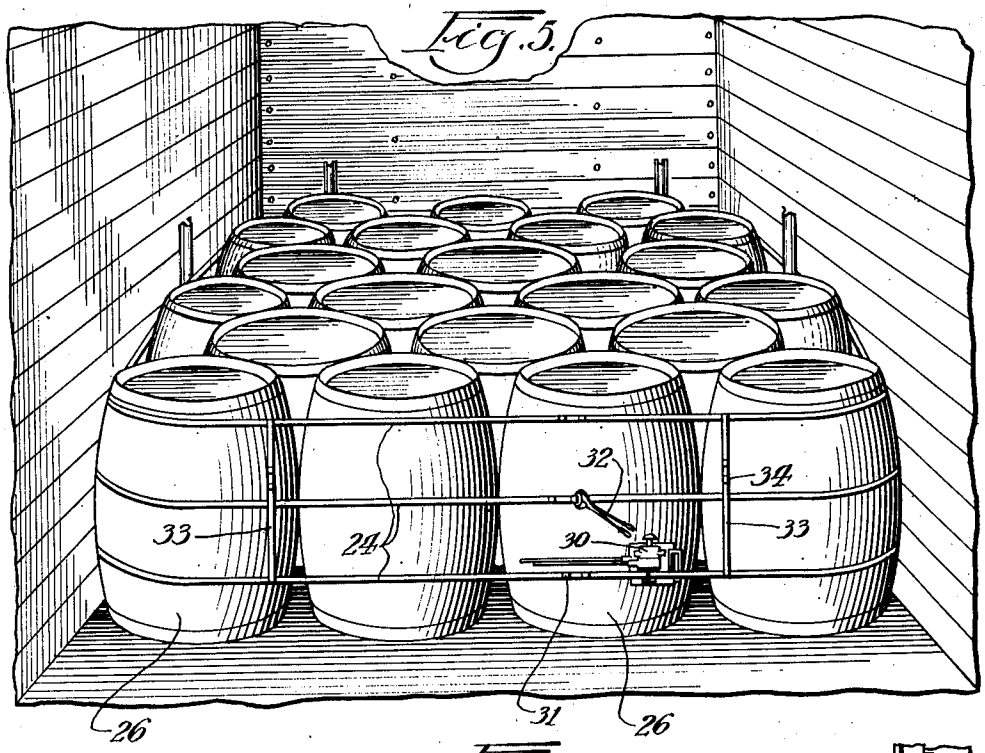
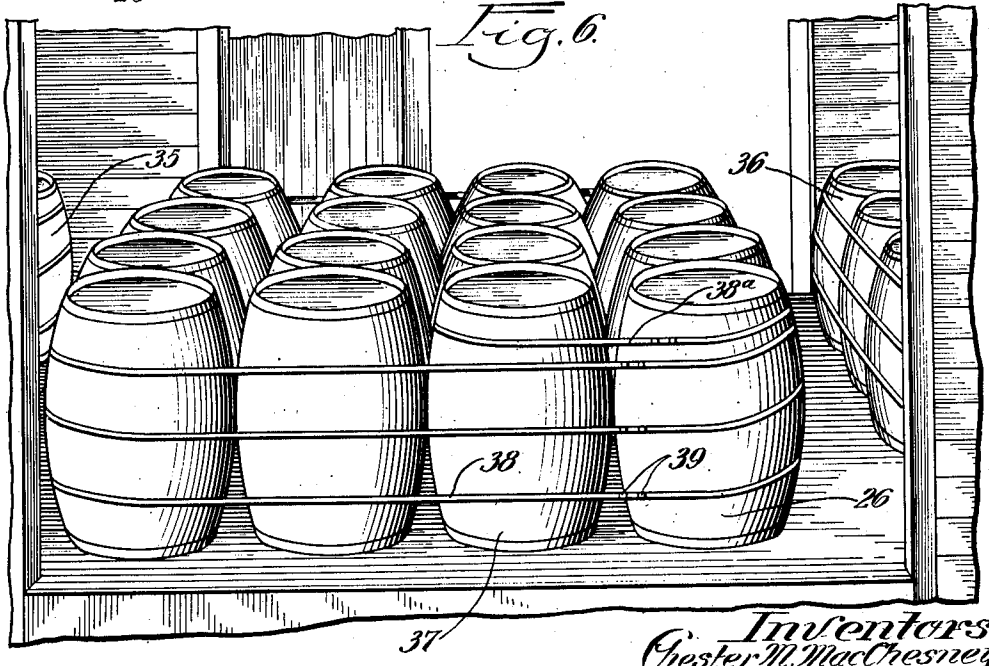


Fig. 6.



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METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 4

Fig. 7.

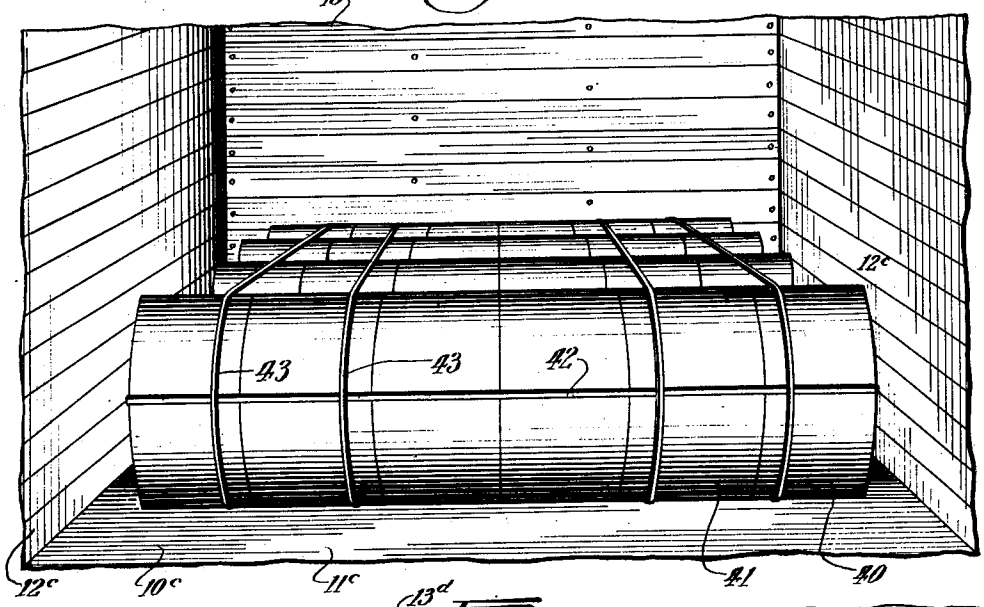
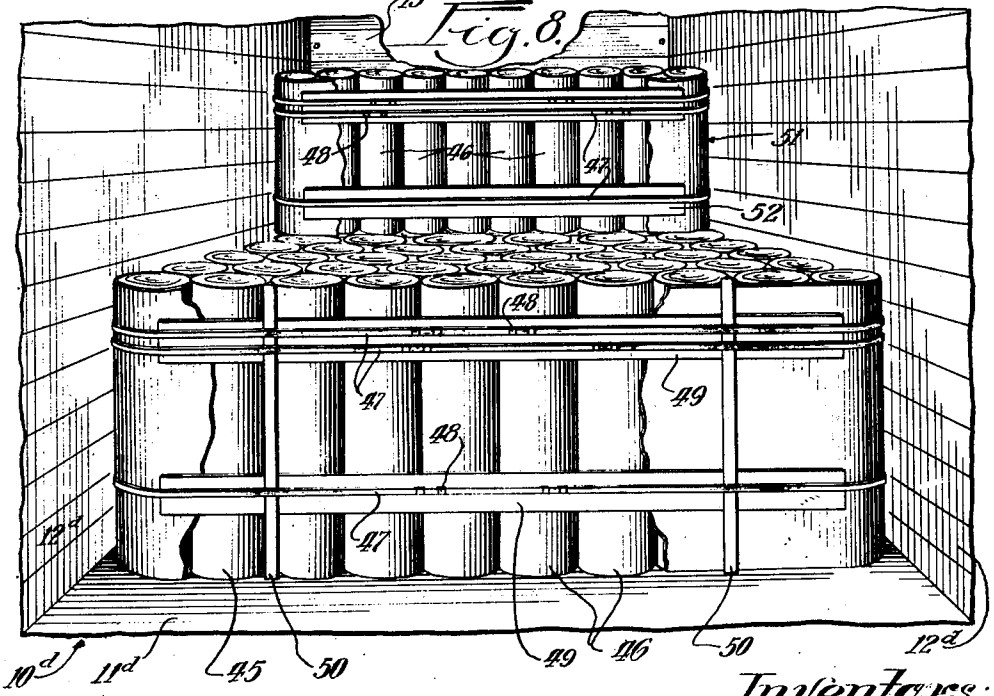


Fig. 8.



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METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 5

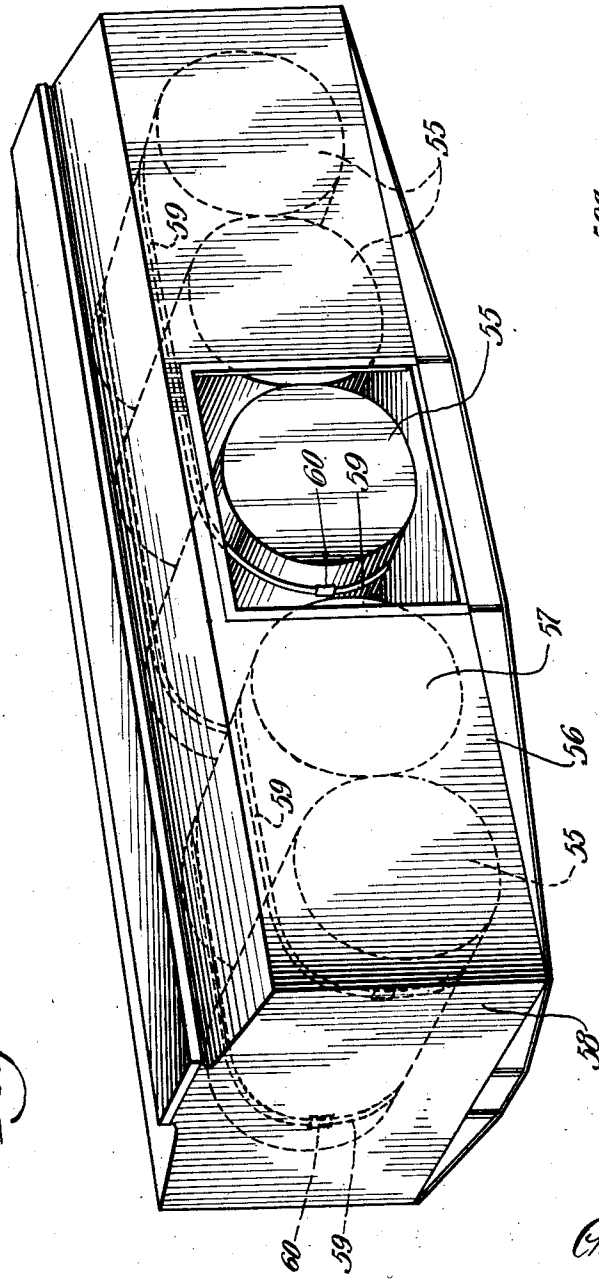


Fig. 9.

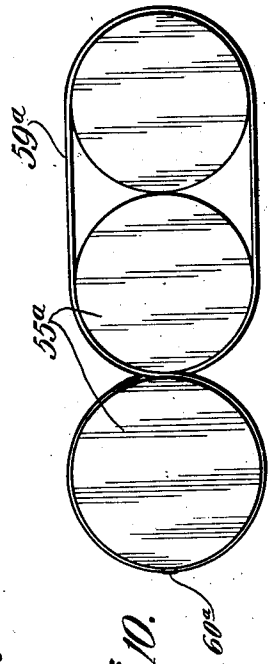


Fig. 10.

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Feb. 26, 1929. C. M. MacCHESNEY ET AL 1,703,495

METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 6

Fig. 11.

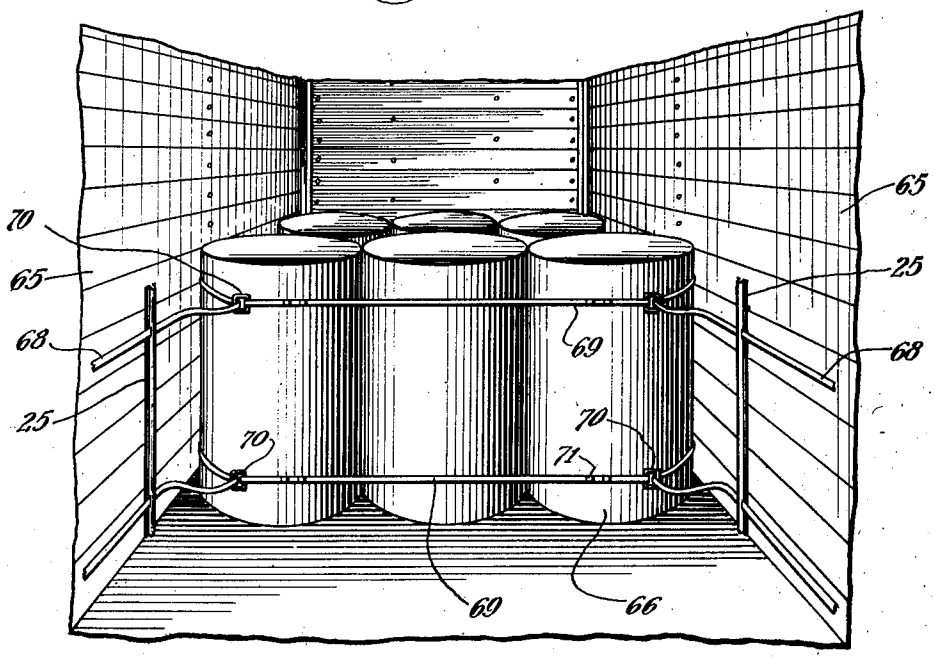


Fig. 12.

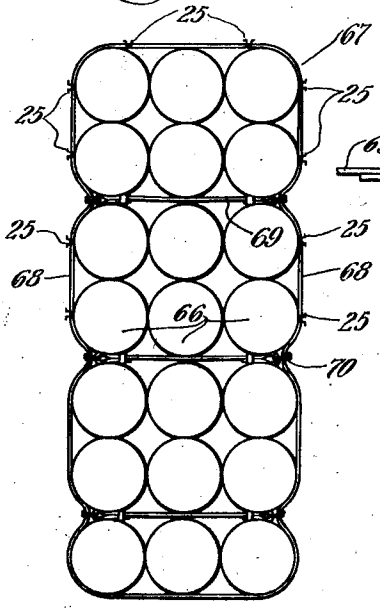


Fig. 13.

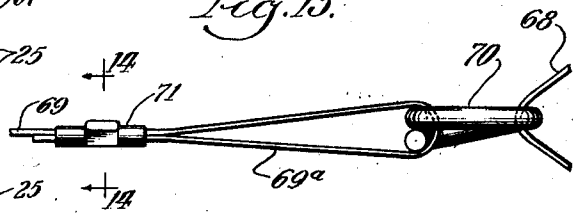
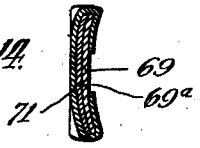


Fig. 14.



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METHOD OF AND MEANS FOR LOADING FREIGHT CARS

Filed Feb. 9, 1926 7 Sheets-Sheet 7

Fig. 15.

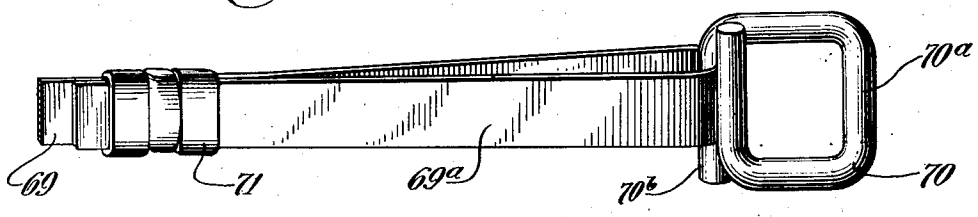


Fig. 16.

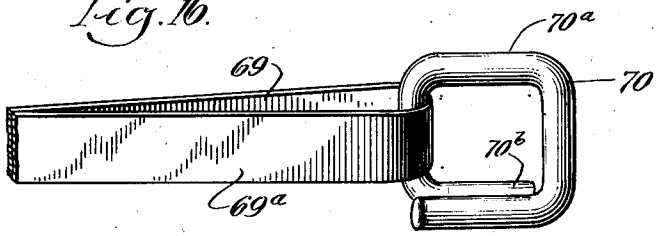


Fig. 17.

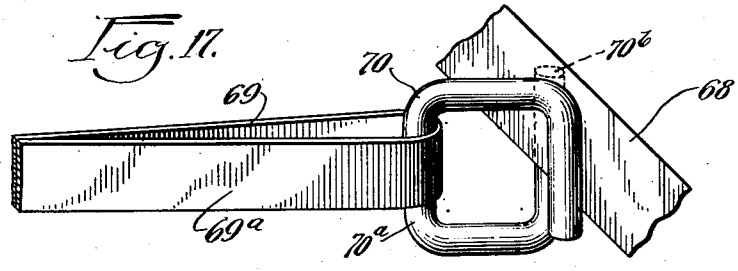


Fig. 18.

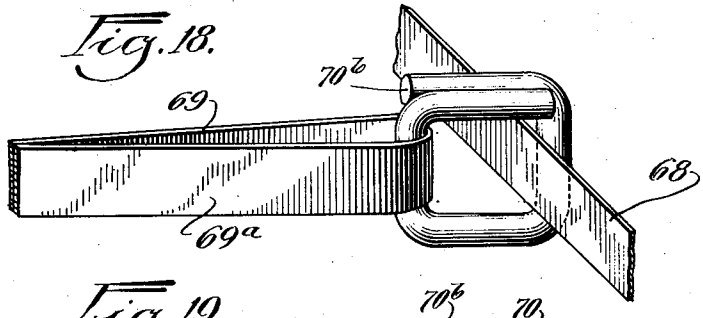
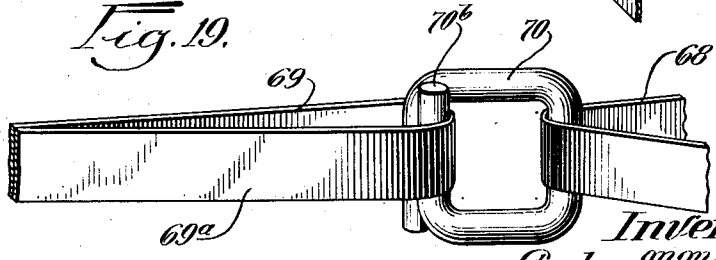


Fig. 19.



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Patented Feb. 26, 1929. 1,703,495

UNITED STATES PATENT OFFICE.

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METHOD OF AND MEANS FOR LOADING FREIGHT CARS.

Application filed February 9, 1926. Serial No. 87,189.

The principal object of the present invention is to provide an improved method of loading freight cars by which any objectionable shifting of the load within the car is prevented and the use of the usual cleats, crates, and other fastening means is avoided. In the loading of railway freight cars, according to the custom heretofore followed, it has been the usual practice to secure boxes, crates and the like, to the floors and walls of the car by means of cleats and braces which are attached to the car structure by nailing, thus necessitating the provision of a supply of cleats, braces and nails at all points where cars are loaded, and causing damage to the car by repeated nailing operations. Where a large number of relatively small boxes or bales are loaded within the car, it has heretofore been difficult or impossible to secure them against relative movement and to prevent damage to them and the car walls during movement and stoppage of the car. Where objects of relatively large weight and momentum have been placed within the car, it has been found that the attachment of these objects to the floor and walls of the car by cleats and the like has often been insufficient to prevent the objects from doing damage due to their momentum upon sudden stoppage of the car, and the result has been that heavy objects have often been thrown through the end walls of railway cars.

The present invention provides an improved method of and means for loading freight cars according to which the foregoing disadvantages are overcome. In the practice of the present invention, the boxes, barrels or the like which constitute the load are secured together to form relatively large load units, the displacement of which within the car is resisted wholly, or substantially so, by frictional contact alone with the car floor, the area of contact being sufficient to prevent any substantial displacement of the load units, due to momentum, when the car is stopped. Due to this frictional contact, the energy of the load unit is dissipated by transmission to the car floor when the car stops so that, even if a slight shifting of the load unit does take place, no damage will result. An important feature of the present invention is the provision of improved means for securing the complementary parts of the load together in relatively large units having relatively large contacting areas on the floor of the car. The preferred method contemplates the use of metal straps which extend around the boxes, bales or the like, constituting the complementary parts of the load, and which may or may not be supported against vertical displacement with respect to each other and with respect to the floor of the car, by means of vertical posts or stays. A further object is to provide a more economical method of and means for loading freight cars. Various other objects and advantages of the invention will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which several adaptations of the present invention in the loading of freight cars are illustrated. In the drawings, Figure 1 shows a perspective view of the body of a railway freight car, with parts thereof broken away, illustrating the use of the present invention in loading the car; Fig. 2 is a view of the interior of a railway car, looking toward one end wall thereof, showing the arrangement of the straps and stays of the present invention preliminary to the formation of a relatively large load unit in one end portion of the car, the ends of the straps being broken away for clearness; Fig. 3 is an enlarged front elevation of a portion of one of the vertical stays illustrating the method of connecting one of the metal straps thereto; Fig. 4 is a side elevation of the structure illustrated in Fig. 3; Fig. 5 is a view similar to that of Fig. 2, illustrating a relatively large load unit, formed of barrels, extending outwardly from the end wall of the car and secured together by means of the straps illustrated in Fig. 2; Fig. 6 is a side elevation of a portion of a railway car, looking through the open doorway thereof, showing the formation of the car load into three relatively large units, two of which are located between the door openings and the end walls of the car while the third unit is located between the door openings; Fig. 7 is a view of the interior of a railway freight car, looking toward the end wall thereof, showing the formation into a single load unit of a plurality of cylindrical vessels, containers, rolls, or

bales; Fig. 8 is a view of the interior of a railway freight car, looking toward an end wall thereof, showing the use of the present invention in forming a plurality of rolls of paper or the like into relatively large load units, one of which is superimposed upon the other; Fig. 9 is a perspective view of a railway freight car showing the use of the invention in loading a plurality of relatively large drums or cylindrical bodies within the car; Fig. 10 is a side elevation showing a modified arrangement of the straps employed in connection with the drums illustrated in Fig. 9; Fig. 11 is another view of the interior of a railway car, illustrating the partial formation of a load unit made up of a plurality of rolls or bales of paper or the like; Fig. 12 shows a top plan view of the complete load unit formed according to the method illustrated in Fig. 11; Fig. 13 shows an enlarged top plan view of the means for connecting one of the cross straps to one of the side members of the encircling strap or other flexible member; Fig. 14 shows a cross-section on the line 14—14 of Fig. 13 illustrating the formation of one of the sealing joints which may be employed in connection with this and other uses of the invention; Fig. 15 shows an enlarged side elevation of the end of one of the cross straps employed in the loading arrangement shown in Figs. 11 and 12, illustrating the method of attaching the connecting link to the loop at the end of the cross strap; Fig. 16 shows a side elevation similar to that of Fig. 15, illustrating the link after it has been partially turned from the position illustrated in Fig. 15; Fig. 17 is a view similar to that of Figs. 15 and 16, showing the link turned to the position which is occupies when the encircling strap is inserted therein; Fig. 18 shows the relation of the parts after the encircling strap has been inserted in the link and the link partially turned to its final position, and Fig. 19 shows the link in the final position which it should preferably occupy after the formation of the load unit has been completed.

In Figure 1 of the drawings, the freight car 10 is shown as having a floor 11, side walls 12, end walls 13, a roof 14 and doorways 15, as in the usual freight car construction. The supporting carriage structure of the car has not been illustrated since it has no direct connection with the present invention. The load within the car is shown as being formed into two relatively large units 16 and 17, the unit 16 being made up of a plurality of goods containing boxes 16^a, while the load unit 17 is made up of a plurality of other goods containing boxes 17^a. Each of the load units 16 and 17 occupies substantially all of the space between the door openings 15 and one end wall 13 of the car. The complementary parts of the load unit 16 are secured together by means of encircling members 18 which may preferably be sheet-metal straps. In this instance, there are two straps 18 which completely encircle the boxes 16^a, the ends of the straps being united adjacent the central part of the car by means of clamps or sealing devices 19. The straps 18 are drawn taut preliminary to the application of the fastening devices 19 and thus hold the boxes 16 in close assembled relation so that the boxes of the load unit are incapable of movement except as a group and this group movement is prevented or substantially overcome by the frictional contact of the lower surfaces of the boxes with the floor 11 of the car. A relatively small space 20 is preferably allowed to remain around the three sides of the load unit 16 which are adjacent to the walls of the car so that a slight shifting of the load unit on the floor may take place without the unit engaging any of the walls. The load units 17, made up of the separate boxes 17^a, are secured together by straps 21 which are drawn tightly around the group of boxes so that they are held in close assembled relation, the ends of the straps being connected adjacent the central part of the car, in the manner illustrated in connection with the strap 18, on the load unit 16. The load unit 17 is also preferably spaced slightly from the walls of the car as shown at 22 and the relatively large contacting area of the load unit 17 on the floor of the car is sufficient to prevent any substantial movement thereof during the movement or upon the sudden stoppage of the railway car, but if a slight movement does take place the spacing from the car wall will prevent any damage being done. This method of uniting the individual boxes or complementary parts of the load of the car into relatively large units extending, as shown in this instance, substantially throughout the distance between the side walls of the car and from the door openings to the end walls of the car, is of great advantage in preventing or substantially overcoming the movement of the load within the car and in preventing damage to the walls and floor of the car by the practice of nailing which has heretofore been followed. The load units may be of any desired height, depending upon the dimensions of the individual boxes or other objects which make up the relatively large units and, as hereinafter more fully described, one relatively large load unit may be superimposed upon another.

As illustrated in connection with the load unit 17 shown in Fig. 1, the straps 21 which extend around the unit are spaced from each other and from the floor of the car by means of vertical stays or posts 23 which are united to the straps in any convenient manner and which serve to hold the straps in the proper spaced relation before they have been drawn taut around the group of boxes. The use of the vertical supporting stays is of particular

advantage in holding the straps in place during the process of moving the barrels, boxes or other units in the car. In Fig. 2, there is illustrated the interior of a railway car 10^a, looking toward one end wall 13^a thereof, a plurality of metal straps 24 being shown supported in proximity to the end wall 13^a and the side wall 12^a by means of vertical stays 25. A number of barrels 26 are shown adjacent to the end wall of the car, indicating the partial loading of the elements which make up the relatively large units to be secured together by the straps 24. Although the vertical stays may be of various forms, they are preferably of the improved form shown in Figs. 2, 3 and 4, according to which each stay or post 25 is formed of metal of angular cross section, the side walls 25^a of which are provided with outwardly directed flanges 25^b. These flanges have angular parts thereof cut away and bent inwardly at intervals to form spikes 25^c which are adapted to be driven into the interior walls of the car preliminary to and during the loading of the car. Each member 25 is further provided with a plurality of notches 28 extending inwardly from the apex of the member into the side walls 25^a thereof. Each notch 28 comprises a vertically extending undercut portion 28^a in each of the side walls 25^a of the stay, these arms 28^a of the notches having communication with the central openings 28^b thereof through which the metal strap 24 in inserted into the notch. The projection 25^d at one side of the opening 28^b is provided with end surfaces extending at right angles to the longitudinal axis of the member 25, but the projection 25^e at the other side of the central opening 28^b is tapered inwardly toward the upper ends of the portions 28^a of the notches, as shown by the inclined surfaces 25^f, so that in applying the metal strap 24 to the stay, it can be slid through the opening 28^b upwardly to the position shown by dotted lines 24^a, in Figs. 3 and 4, after which the member 24 may be moved downwardly to lie behind the projection 25^d, in which position it is retained in place on the stay during the loading of the car and after the load unit has been formed.

After the desired number of the barrels 26 have been placed in the car to form a load unit of the desired extent, the free ends of the strap 24 are drawn together and stretched taut, which operation may and preferably will result in the removal of the stays 25 from the walls of the car, since the spikes 25^c on the stays which are preferably employed for holding these stays in place during the process of loading are relatively short, and the stays then move inwardly so that the straps 24 are permitted to lie in close contact with the surfaces of the barrels throughout the outer periphery of the load unit, as shown in Fig. 5. The overlapping ends of the strap are stretched taut by a suitable stretching device 30 or by other means adapted for that purpose and after the strap has been drawn to the desired taut condition to hold all of the barrels 26 in close assembled relation, the overlapping ends of the strap are secured together by means of seals 31, applied by a sealing device 32, or they may be secured together by riveting, welding, or other suitable means. If desired, the straps may be tied together vertically at the end of the load unit which adjoins the central part of the car by means of vertical loops of straps 33 which are united at their ends by seals or other fastening means 34. In this way, the straps or other tying devices which are to be employed for uniting the barrels in a relatively large load unit, are held in the proper vertical spaced relation during the process of moving the barrels into the car and they are held in position to insure their proper relation after the load unit has been formed. The stays 25 serve not only to space the binding straps 24 apart both before and after the load unit is formed but they also serve to maintain the straps against downward displacement after the straps have been tightened and secured around the load and the stays have thereby been moved inwardly from the car walls; the straps or spacers 33 serve merely to space the binding straps 24 apart.

In Fig. 6 of the drawings, a more complete loading of the car is illustrated, a number of the barrels being grouped and tied together to form two load units 35 and 36 extending from the door openings to the opposite end walls of the car, while a third load unit 37 is located between the door openings of the car and between the end load units 35 and 36. The central unit 37 is made up of a plurality of barrels 26 which are tied together by means of straps 38, the straps in this instance being wound around the groups of barrels and united by means of seals or other fastening devices 39, a portion of the strap 38 being extended transversely of the car between the two middle rows of barrels, as shown at 38^a, so that a portion of one load unit may be secured as a sub-unit independently of the other barrels which make up the load unit 37.

In Fig. 7 of the drawings, there is illustrated another adaptation of the invention in loading a car 10^c having a floor 11^c, side walls 12^c and end walls 13^c, the load in this instance being made up of a plurality of cylindrical tubs or containers 40 which are arranged in cylindrical rows 41, there being four cylindrical rows arranged side by side between the end wall of the car and the central portion thereof. All of the containers 40 are secured together against lateral spreading toward the walls of the car by means of an encircling strap 42 which is drawn taut and secured at its ends after the containers have been placed in close assembled relation. The containers are secured together against

endwise displacement longitudinally of the car by means of a plurality of straps 43 which encircle the rows of containers and are secured together at their ends after being stretched into a taut condition. In this way, a number of cylindrical objects which are ordinarily difficult to secure in place except by the use of elaborate crates, are fixed against displacement within the car due to ordinary shocks by the simple and novel method of strapping herein disclosed.

In Fig. 8 of the drawings, there is illustrated the use of the invention in tying together and loading another class of objects, one load unit being superimposed upon the other. As here illustrated, the car 10^a comprises a floor 11^a, side walls 12^a, and end walls 13^a, the floor serving to support a load unit 45 made up of a plurality of bales or rolls 46 of paper or the like which are cylindrical in form and of substantially the same size. The rolls 46 are placed on end resting on the floor 11^a and a relatively large number of these rolls are tied together by means of encircling straps 47, the ends of which are secured together by means of seals 48 or other fastening devices, after the straps have been drawn taut around the group of paper rolls. In this instance, two substantially parallel straps encircle the upper part of the load unit while a single strap is passed around the lower part thereof. To prevent injury to the rolls of paper and to facilitate the drawing of the straps into taut condition, wooden boards 49 may be placed across the car at the end of the load unit, or on each lateral side thereof, these boards being located within the straps and spaced apart vertically by means of posts 50. This reinforcing structure comprising the boards 49 and the posts 50 is secured against displacement by the encircling straps 47 and does not require any nailing to the floor or walls of the car. A smaller load unit 51 of paper rolls 46 is shown superimposed upon the load unit 45, the upper load unit being secured by other straps 47 and fastening devices 48, and boards 52 being passed across the unit transversely of the car beneath the straps. By this loading arrangement, a large number of paper rolls are secured against displacement with respect to the walls of the car by their weight and frictional contact with the floor alone and an upper layer of load units, preferably of smaller size, may be superimposed upon the lower load unit and held in place by frictional contact therewith.

In Figs. 9 and 10 of the drawings there is illustrated another use of the invention in securing together a number of relatively large drums or cylinders 55, such as the drums on which cable and the like is commonly wound. In the arrangement illustrated, the drums are of considerable length and extend nearly across the railway car 56 between the side walls 57 thereof. Three of the drums 55 are arranged in a group extending inwardly from one end wall 58 of the car, with their end walls lying substantialy parallel to the side walls of the car. The drums are secured together by two encircling straps 59 which are drawn taut and their ends then secured together by means of sealing devices 60 or other suitable means. If desired, other drums 55 may be formed into a unit consisting of two members, as illustrated by dotted lines at the other end of the car. Instead of causing the straps to extend continuously around the group of drums, as shown in Fig. 9, a strap 59^a may be caused to pass around the drums 55^a in the manner illustrated in Fig. 10, where it will be seen that the straps are crossed between two of the drums.

The use of the invention for forming a relatively large load unit made up of rolls, bales or other objects in which the unit is subdivided into sections by cross straps or other tying members, is illustrated in Figs. 11 to 19, inclusive. In this embodiment, the railway car 65 is shown being loaded with a plurality of cylindrical rolls 66 which are adapted to form the complete load unit 67 illustrated in Fig. 12 in which the entire group of bales is surrounded by the encircling straps 68 connected by a plurality of cross straps or tying members 69. In forming the load unit 67, the straps 68 are first arranged along the walls of the car, in the manner previously described, being supported by the vertical stays 25. After a group of bales has been put in place, the straps 68 extending along the side walls of the car are connected by the cross straps 69 having links 70 connected with the ends thereof to form sliding engagements with the straps 68. Another group of bales is then put in place in front of the cross straps, as illustrated in Fig. 11, and a second pair of cross straps is then put in place in front of the last mentioned group. In this way the sub-groups of bales are put in place until the bales of the entire unit have been assembled and then the straps 68 are drawn taut at the end of the unit adjacent the car doors and the overlapping ends are united by seals or other suitable devices so that all of the bales of the entire unit 67 are held in compact relation. The cross straps 69 are preferably somewhat shorter than the width of the group of bales, as shown in Fig. 12, so that the encircling straps 68 are drawn inwardly at the points of division between the sub-units or groups, thus putting the cross straps under tension and thereby holding the elements of the load unit under compression. It will be understood, of course, that when the straps 68 are drawn taut, the spikes 25^c of the stays 25 are pulled out of the car walls so that the stays will move inwardly and position themselves in contact with the vertical sides of the outermost bales. This method of loading has the

advantage that it effectually prevents relative movement of the individual bales within the unit during the movement of the car. If, in case of sudden impact, there is a momentary compression or contraction of the entire unit, the stays 25 hold the straps in place vertically so that when the unit expands and assumes its normal position, the straps will again contact with the outer wall of the unit and hold it in assembled relation.

For convenience in assembling the straps and for permitting a free sliding movement of the straps 68 with respect to the cross straps during the process of rendering the straps 68 taut, the links 70 preferably have the form shown in Figs. 15 to 19, inclusive, where it will be seen that the link is formed from a bar of circular cross-section which is bent into rectangular form, the intermediate wall 70^a of the link being opposite to the overlapping ends 70^b of the bar which form the opposite wall. The cross strap 69 has a loop 69^a formed in the end thereof, the contacting portions of the strap at the inner end of the loop being connected by a sealing device 71. The link 70 is passed into engagement with the loop 69^a by passing the loop through the slot between the end portions 70^b of the link. The link is then turned to the intermediate positions shown in Fig. 16 and to the position shown in Fig. 17 where the outer strap 68 can be passed into engagement with the link by sliding it between the end portions 70^b. The link 70 is then preferably turned back to the intermediate position shown in Fig. 18 until it occupies the final position shown in Fig. 19, wherein the overlapping ends 70^b of the link are located within the looped end 69^a of the cross strap. The outward pull on the link 70 by the cross straps 68 then tends to cause the links 69^a to compress the ends 70^b of the link upon each other and the parts are effectually held against displacement while at the same time the strap 68 has a free sliding engagement with the outer wall 70^a of the link during the process of rendering the straps taut.

The strapping material and the vertical stays which are preferably employed in carrying out the loading method of the present invention may be conveniently maintained in stock at the points where railway cars are loaded and their use provides a convenient and economical method of loading the car without causing injury thereto. In the case of sudden stoppage of the car, the energy represented by the momentum of the relatively large load units is transmitted by the frictional contact to the floor of the car and dissipated in the car under-frame without injury to the car. If a slight shifting of the large load unit takes place while its energy is being dissipated, no injury is done since the load units are preferably spaced slightly from the car walls and slight relative shiftings of the load which may occur compensate each other so that actual contact of the load unit with the walls of the car occurs very infrequently or not at all and the application of sudden blows and impacts on the walls of the car is at all times prevented.

Although various illustrations of the practice of the improved method of the present invention have been shown and described, together with one embodiment of the improved means for securing and forming the load units, it will be understood that various means may be employed and that the improved method may be practiced in various ways within the scope of the appended claims.

We claim:

1. The method of loading a car which consists in forming a plurality of load elements into a relatively large load unit freely movable with respect to the car but held against substantial displacement by frictional contact with the car floor.

2. The method of loading a car and preventing damage to individual load packages which consists in binding a plurality of said packages together in the car to form a movable shipping unit resting on the bottom of the car with sufficient frictional resistance to remain stationary under lighter shocks but capable of movement under heavier shocks.

3. The method of loading a car and preventing damage to individual load packages which consists in binding a plurality of said packages together in the car to form a movable shipping unit resting on the bottom of the car with sufficient frictional resistance to remain stationary under lighter shocks but capable of movement under heavier shocks and disposing said load unit at such a distance from the walls of the car as will permit it to move relatively to the car walls when said heavier shocks are received.

4. The method of loading a railway freight car having side walls and end walls and door openings in the side walls substantially midway between their ends, of forming a plurality of load elements into a relatively large load unit occupying and free to move within the space between an end wall and said door openings, said load unit being of sufficient size and weight to maintain itself against displacement entirely by frictional contact with the floor of the car.

5. The method of loading a freight car which consists in arranging a plurality of load elements in a group, securing an encircling flexible member around said group to form a load unit, and dividing said load unit into sub-units by a member extending between and connected to opposite portions of said encircling flexible member.

6. The method of loading a freight car which consists in arranging a plurality of load elements in a group, securing an encircling flexible member around said group to

form a relatively large load unit, and connecting the opposite portions of said encircling flexible member by a tying member having a sliding engagement therewith.

7. The method of loading a freight car which consists in arranging a plurality of load elements in a group, passing a flexible strap around said load elements, connecting opposite portions of said strap by a tying member having a sliding engagement therewith, then drawing said flexible strap taut to hold said load elements in assembled relation, and then securing the ends of said flexible strap together.

8. The method of loading a freight car which consists in arranging a plurality of load elements in a group, passing a metal strap around said load elements, connecting opposite portions of said strap by a tying member having links at its ends to form detachable sliding engagements with said strap, drawing said strap taut, and securing the ends of said strap together.

9. The method of loading a freight car which consists in releasably securing vertical stays to the walls of the car, attaching an encircling flexible member to said stays, arranging a group of load elements within said flexible member to form a sub-unit, connecting opposite portions of said flexible member by a cross member, having a sliding engagement therewith, placing another group of load elements adjacent said cross member to form another sub-unit, drawing said flexible strap taut, and securing the ends of said strap together.

10. Apparatus for use in loading freight cars comprising a metal rod adapted to extend upwardly from the car floor and having means to permit the attachment thereof to the interior of a car wall, said rod being provided with means to engage and support a flexible binder in position to be passed around a unit of the load.

11. Apparatus for use in loading freight cars comprising a supporting rod having a spike extending therefrom and a flexible member connected to said rod.

12. Apparatus for use in loading freight cars comprising a plurality of upwardly extending supporting rods mounted within the walls of a freight car, and a flexible member attached to each of said rods in position to be passed horizontally around a load unit.

13. Apparatus for use in loading freight cars comprising a supporting bar of angle cross-section having a notch therein at the apex of the angle, and a flexible member detachably engaging said notch.

14. Apparatus for use in loading freight cars comprising a supporting bar of angle cross-section having means at the apex thereof to engage a strap and having lateral flanges provided with spikes adapted to engage a car wall.

15. Apparatus for use in loading a freight car comprising a supporting bar of angle cross-section having a notch therein at the apex of said angle, said notch having an opening and undercut portions providing overhanging lugs, and a sheet-metal strap adapted to be inserted upwardly beneath one of said lugs and then to be lowered behind the other of said lugs.

16. Apparatus for use in loading a freight car comprising a supporting bar having a plurality of spaced notches therein, and a plurality of flexible straps each detachably engaging one of said notches.

17. Apparatus for use in loading a freight car comprising a supporting bar having a notch therein, said notch having an opening with undercut portions providing two overhanging lugs, one of said lugs having an inclined under surface, and a flexible member adapted to be inserted into said notch beneath said lug having said inclined surface and then to be moved in a reverse direction behind the other of said lugs.

18. The method of loading a freight car which consists in arranging a plurality of load elements in a group, securing said elements in close spaced relation by an encircling flexible member, and connecting opposite portions of said encircling member by a cross member placed under tension.

19. The method of preventing damage during transit to merchandise packages, due to the relative movement of said packages, the one upon or against another, which consists of assembling said packages into a group or assembly of sufficient size and weight as a group to remain practically immovable by its own weight during transit, and binding the individual packages together in the unitary group assembly under tension to prevent relative independent movement thereof in the unitary assembly.

20. The method of preventing damage during transit to merchandise packages due to compressive or impact action exerted by one movable package upon or against another, which consists in assembling a plurality of said packages into a unitary mass assembly; applying to the mass assembly, binders under tension to bind the individual packages together in immovable relation to each other, and to hold the mass assembly in unattached relation with respect to the carrier, the aggregate weight of the packages composing the unitary assembly serving to resist relative movement of the mass assembly and the carrier.

21. In a cargo shipment, the combination of a plurality of independent merchandise packages of a size and nature to be liable to damage during transit, due to the impact of the packages upon each other; and a binder applied around the plurality of packages to hold the individual packages against relative

movement with respect to each other, and to bind them together into an unattached unitary mass assembly of sufficient weight to remain practically immovable during shipment.

22. The method of securing merchandise, cargo or the like to prevent damage or injury thereto during transit, which consists in binding together a plurality of individual units of the merchandise or cargo to form a movable unitary mass assembly of sufficient mass weight to enable its inertia to resist undue movement of the mass assembly, and wherein individual units are yieldingly restrained from undue relative movement in the mass assembly.

23. The method of loading a car with load elements and preventing damage to the same during transit which consists in placing a flexible binder within the car in position to be passed around the load elements, then arranging in said car a sufficient number of said load elements to form a load unit adapted to retain itself substantially in place by its weight and frictional contact with the car, and then fastening said binder tightly around said load elements to form a compact load unit.

24. The method of loading a car with load elements and preventing damage to the same during transit which consists in placing a flexible binder within the car in position to be passed around a group of said load elements, then arranging in said car a sufficient number of said load elements to form a load group adapted to retain itself substantially in place by its weight and frictional contact with the car, and then fastening said binder tightly around said load elements to form a compact load unit spaced from a wall of the car to permit limited movement of the load unit with respect to the car under the influence of shocks encountered during transit.

25. The method of loading a carrier with load elements in unattached relation thereto to prevent damage during transit which consists in applying a flexible band to the interior of a carrier in position to extend partially around the space to be occupied by a group of said load elements, then placing said load elements in said carrier and forming in said space a closely arranged group of sufficient size and weight to retain itself substantially in place when bound together although unattached to the carrier, then drawing said band taut around said group and securing together the ends of said band to hold the group of load elements in a compact unit.

26. The method of loading a car with merchandise packages and preventing damage thereto during transit which consists in supporting a plurality of flexible members on the interior of the car to extend partially around the space to be occupied by the packages, then arranging in said space a plurality of said packages to form a group spaced from the end wall of the car and of sufficient size and weight to retain itself substantially in place when bound together, and then drawing said binders taut around said packages and securing said binders to form a compact load unit which is free to move except for the resistance provided by its weight and frictional contact with the car.

27. The method of storing a cargo of load elements in unattached relation to the carrier which consists in draping a series of parallel bands about the space in the carrier to be occupied by a unit of the cargo, the bands being supported from the floor of the car by stays which are provided with means for temporarily attaching the same to the walls of the car, loading the draped-space in the car with load elements in sufficient quantity to render their combined mass and frictional contact with the car sufficient to prevent excessive movement thereof during transit, and tightening and securing said bands about the load elements thus loaded to secure the same in a load unit unattached to the car.

28. The method of stowing and binding a cargo in freight cars and the like which consists in draping a series of bands along the walls of the car about the space to be occupied by a unit of the cargo, the bands being temporarily attached to the car walls by stays which serve to space the bands apart and to support them above the car floor both before and after the cargo is bound, loading the space to be occupied with load elements in sufficient quantity to make up a cargo unit having sufficient mass and frictional contact with the car to cause it to remain substantially stationary during transit, and securing said bands about said cargo unit to maintain the elements of said unit in compact assembled relation unattached to the car.

29. The method of loading a car with elements and preventing damage thereto during transit which consists in arranging a flexible binder along the walls of the car to extend partially around the space to be occupied by a load unit, supporting said binder by vertically extending stays which are temporarily attached to the car walls, placing within said space a plurality of load elements in close spaced relation and then drawing and securing said binder in taut condition around said load elements to hold them in compact relation as a load unit unattached to the car, said vertical stays being withdrawn from the car walls by the operation of tightening and securing said binder around said load elements and serving thereafter by engagement with the car to maintain said binder against downward displacement.

30. Apparatus for use in loading freight cars comprising a plurality of upwardly extending supporting rods provided with means for attaching them to the car walls, and a

flexible member detachably connected to each of said rods.

31. Apparatus for use in loading freight cars comprising a plurality of upwardly extending supporting rods temporarily attached to the car walls and provided with openings therein, and a flexible member loosely engaging said openings in said rods and extending partially around the space to be occupied by a load unit.

In testimony whereof, we have subscribed our names.

CHESTER M. MacCHESNEY.
JOHN EKERN OTT.