Jan. 14, 1947. J. M. MOON 2,414,160

TRANSPORTATION OF MERCHANDISE

Filed July 5, 1943 2 Sheets-Sheet 1

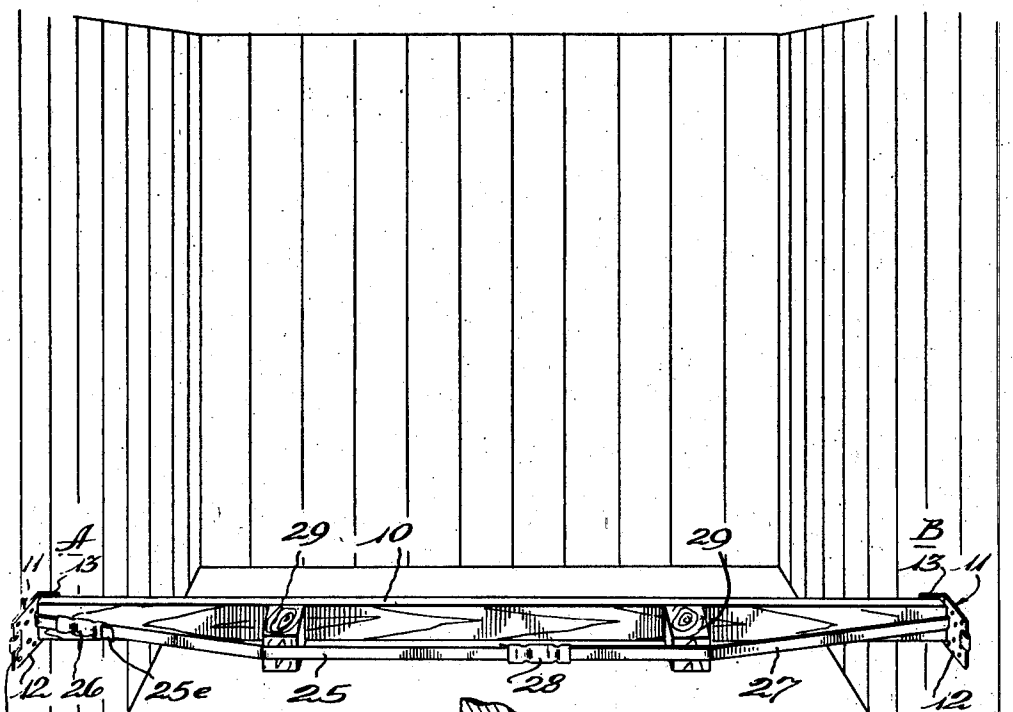


Fig. 1.

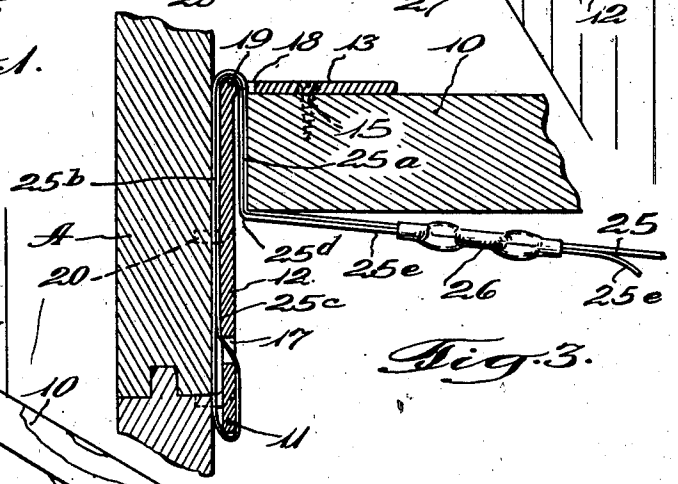


Fig. 3.

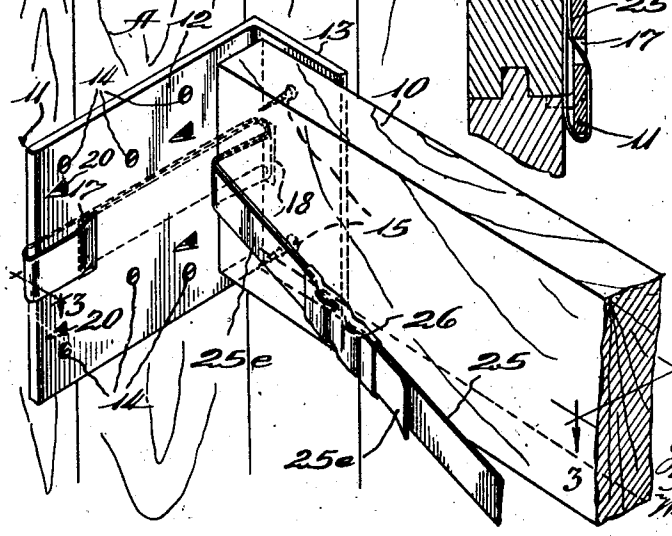


Fig. 2.

Inventor
John M. Moon
By
Williams, Bradbury & Hinkle
Attorneys

Jan. 14, 1947. J. M. MOON 2,414,160

TRANSPORTATION OF MERCHANDISE

Filed July 5, 1943 2 Sheets-Sheet 2

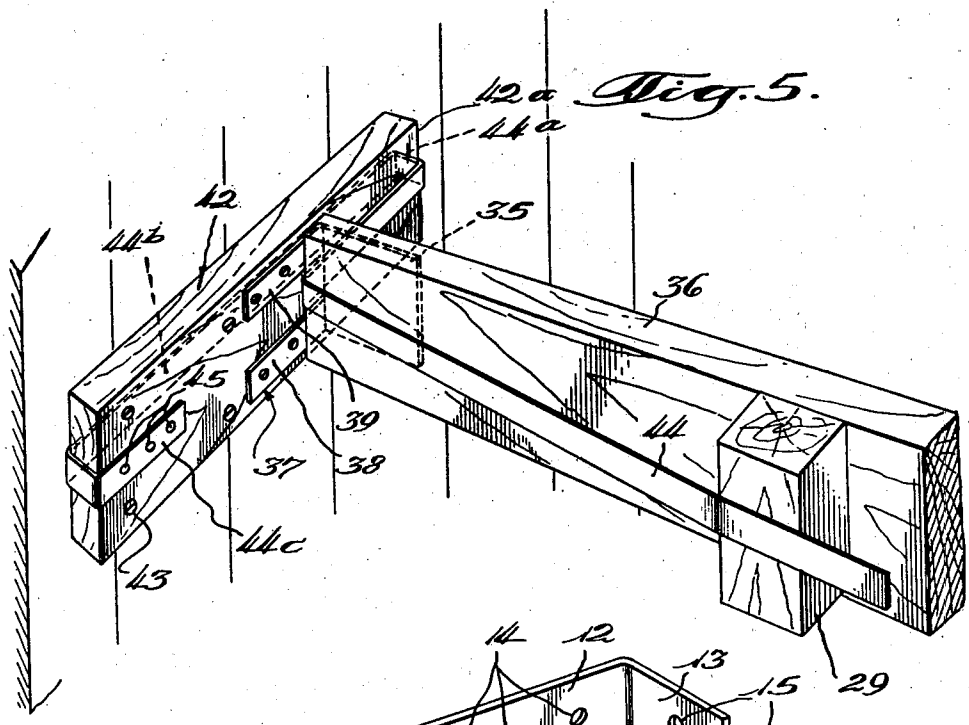


Fig. 5.

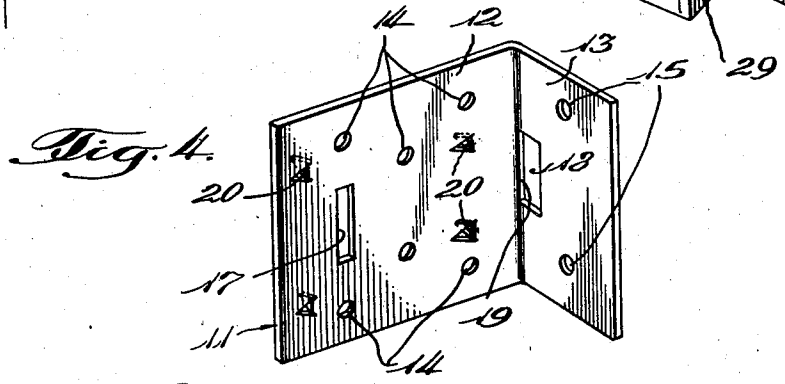


Fig. 4.

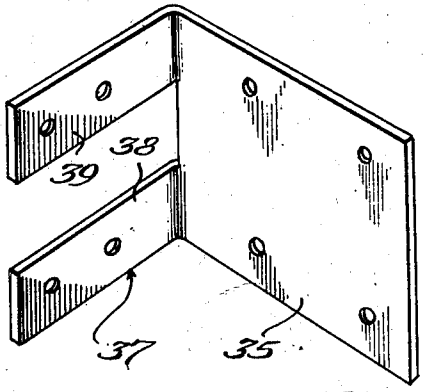


Fig. 6.

Inventor:
John M. Moon
By Williams, Bradbury & Hinkle
Attorneys

Patented Jan. 14, 1947

2,414,160

UNITED STATES PATENT OFFICE

2,414,160

TRANSPORTATION OF MERCHANDISE

John M. Moon, Evanston, Ill., assignor to Signode Steel Strapping Company, Chicago, Ill., a corporation of Delaware

Application July 5, 1943, Serial No. 493,561

3 Claims. (Cl. 105—369)

1

My invention relates to the transportation of merchandise. It is particularly, although not exclusively, applicable to the retention in railway box cars of load units consisting of merchandise in crates, cartons and other relatively light and fragile merchandise packages.

The load retaining arrangement illustrated in the J. B. Frear Patent No. 2,226,373 is satisfactory under many conditions, but situations exist where its application is not sufficiently flexible to afford the best results. Thus the location of the tensioned binder anchorages back of or behind the front or doorway end of a load unit makes it necessary to anchor the binder straps to the car side walls before the loading in one end of the car is completed. In order not to interrupt the work of the loading crews, it is usually the better practice to anchor the binder straps before any of the load is moved in. In the loading of known numbers of uniformly sized packages, the foregoing procedure may be wholly satisfactory but where the packages vary in size or the load units differ in quantity, it may not be readily possible always to insure that the binder anchorages are behind the face of the load—at least not without using unnecessarily long binder sections—so that the binder tension exerts force inwardly, i. e., toward the end of the car.

One of the objects of my invention is to provide for the anchorage of the tensioned binder to the car walls in front of the outer or doorway face of a load unit. Because of this capability my invention is especially applicable to the transportation of miscellaneous packages, and to stowage in less than car load lots, such as in the case of so-called "pool cars" or "stop-over loads."

A further object is to increase the resistance of the binder in the region of greatest strain so that greater holding power may be secured without the necessity of increasing the basic strength (size, weight, etc.) of the binder strap.

Other objects and advantages will hereinafter appear.

Two embodiments of the invention are shown in the accompanying drawings, wherein

Fig. 1 is a perspective of the interior of one end of a box car showing one of my load braces or gates as preferably applied. For sake of clarity, the load behind the brace has been omitted.

Fig. 2 is an enlarged perspective of one end of the brace or gate, showing in greater detail

2

its attachment to the car side wall and the binder anchorage;

Fig. 3 is a section on the line 3—3 of Fig. 2, showing how the ends of binders are, in effect, anchored to the car side walls;

Fig. 4 is an enlarged perspective of the reaction and anchoring bracket used in the brace or gate illustrated in Figs. 1 to 3;

Fig. 5 is a perspective similar to Fig. 2 of a modified arrangement; and

Fig. 6 is a perspective of a reaction bracket suitable for the modified gate shown in Fig. 5.

Referring first to Fig. 1, the load in one end of the box car fills the interior space out to the cross-beam 10, which is preferably made of wood. The size and rigidity of the cross-beam may depend upon whether or not an intermediate strut or other trussing device is employed. Other factors being equal, the rigidity of the beam ordinarily should be greater if the strut is omitted. The length of the beam should be such as to extend across the car and, when the final assembly is completed and the binder-sections are tensioned, preferably snugly to fit against the wall brackets to be now described.

The opposite ends of the cross-beam 10 are anchored, at least against inward or rearward movement, to the two car side walls A and B by means of reaction and binder anchoring brackets 11. These brackets are adapted to be fastened to the car side walls in advance of the front or doorway face of the load so that they may be positioned after the unit they are to assist in retaining has been positioned. Referring particularly to Fig. 4, each bracket, which is preferably made from a single piece of sheet metal, has a wall attaching flange 12 and a beam abutment flange 13 at right angles to each other. When in position, flange 12 extends forwardly of the load unit and lies along and is attached to the adjacent car side wall A or B, as the case may be. This flange may be provided with holes 14 for the reception of the nails or screws whereby it is fastened to the car side wall. Flange 13 forms an abutment longitudinally as to the car and against which the adjacent end of the cross-beam 10 lies or may be forced so that, when the brackets have been anchored to the opposite car walls, the extent to which the ends of the cross-beam can be moved in toward the load is limited. In this manner the creation of excessive pressures at the corners of a load unit during the tensioning of the binders is avoided. If desired, abutment flange 13 may be provided with holes 15 for receiving nails, or screws or

other appropriate fasteners to attach the associated end of cross-beam **10** thereto. Of course, the cross-beam and brackets are thus fastened together only when the second method of application hereinafter described is employed. That is, when the brackets, cross-beam and binder sections are assembled into a unit prior to application to the load. Flange **12** has a binder receiving opening **17** therethrough and in alignment therewith abutment flange **13** has a similar opening **18** therethrough, preferably substantially at the angle between the two flanges. Opening **18** causes flange **13** to have a binder bearing portion or shoe **19** over which a binder-section may be trained. And if, as shown, this bearing surface or shoe is located to the rear or inside of the front face of flange **13**, the tensioning of the binder will serve to pull the associated end of the cross-beam back toward and tightly against the abutment flange **13** of the bracket as will hereinafter appear. If desired, the attaching flanges of the brackets may be provided with pointed prongs **20**, struck therefrom or attached thereto in any appropriate manner, for piercing the car side walls and assisting the nails or screws to anchor them in place.

To complete the assembly at one end of the brace or gate, a binder section **25**, which preferably has been pre-cut to the desired length, is anchored at one end to a bracket **11** and thereby to a car side wall when the associated bracket is fastened in place. The anchorage is preferably effected in the manner shown in greatest detail in Fig. 3. Thus one end of the binder-section has a portion **25***a* trained to lie between the end of the beam and the bracket attachment flange **12**; it then is passed through the opening **18** bent around bearing surface **19** toward the front and by a portion **25***b* trained along the outside of flange **12** to the end of that flange; it is then reversely bent toward the rear, threaded from front to back through bracket opening **17** and by portion **25***c* again trained along the attaching flange **12** between the portion **25***b* and the flange; it is next again bent forwardly around bearing surface **19** and rethreaded through opening **18** and by portion **25***d* trained along between portion **25***a* and the attaching flange **12** of the bracket. If the strongest anchorage is desired, the extreme end portion **25***e* may be laid along beside the body of the free strap section and securely attached thereto by a suitable seal-joint **26**. By similar procedure one end of a like complementary strap section **27** may be anchored to the bracket **11** for the opposite end of the cross-beam which is attached to the car wall B. When one end of each strap section **25** and **27** has thus been anchored and a cross beam has been placed across the face of the load unit, the free ends of the strap sections are brought together, subjected to the desired tension, preferably by an appropriate tensioning tool, and then joined by a suitable seal-joint **28**. If extra inward pressure is desired in the transverse central region of the load, or if it is deemed desirable to employ a relatively small and consequently not inherently sufficiently stiff cross-beam, an outwardly projecting strut—or struts—**29** may be associated with the cross-beam and the tensioned binder trained over the outer ends thereof as shown in Fig. 1.

The brackets act to snub and thereby to increase the effectiveness of the anchorages for the outer ends of the tensioned binder. As a result the joints **26** may be relieved of much of the strain of tension and shock in transit. As a matter of fact, for load units of relatively light packages or objects, these joints may frequently be omitted and the snubbing action alone depended upon to afford adequate anchorage. If the length of the cross-beam is made such that it would snugly fit across the car from wall to wall, the thickness of the attachment flanges of the two anchor brackets will cause the beam to be slightly over-size when fitted between the two brackets, and result in its taking a slight outward bow. Under such conditions, the tensioning of the binder sections will cause the beam to straighten and not only bear flatly against the face of the load, but also to exert considerable outward pressure against the bracket attachment flanges to assist the nails or other wall anchorages to retain the bracket in place.

In preparing a load unit for shipment, the packages are placed in the car, preferably as compactly as manual handling will permit. When the unit is completed, the gate may be applied thereto in various ways. Thus, for example, the two brackets of a beam, with binder sections threaded therethrough, may be set with the bracket attachment flanges **12** against the car wall and abutment flanges **13** against the outer corners of the load and as closely thereto as can conveniently be done by hand. The attaching flanges are then secured to the car side walls by nails, screws or other appropriate fasteners. Then the beam is set across the front face of the unit and the free ends of the binder sections brought together, the sections passing over the cross-beam stiffening struts if such are used. Tension is then applied to the binder sections. When the cross-beam **10** is placed across the front or doorway face of a load unit, it will usually be impossible to position—or at least not feasible initially to force—the ends of the beam back against the bracket flanges **13**. At one or both ends the beam will lie somewhat in advance of its final position. This may be due to the fact that the transverse mid portion of the load unit is not as compact as along the car walls, or because it is easier to push the small brackets back beyond the overall face of the load than is the case with the beam throughout its length. However, no harm will be done—in fact a better load may be produced—because the binder tension can pull the cross-beam ends back against the bracket flanges **13** with the result that the unit as a whole is more firmly compressed. The tension serves to pull the ends of the cross-beam inwardly or rearwardly relative to the length of the car against the abutment flanges of the brackets, but such flanges limit the movement so that undue strain cannot be put upon the outer corners of the front row of packages. And there the beam is tightly held. When the desired tension has been attained, the free ends of the binder-sections are permanently joined. Another method of applying the gate is to assemble the cross-beam, the two brackets and the two lengths of binder strap as a unit and position it as such to the front face of the load. The use of nails or screws through the flange holes **15** and into the cross-beam, and the anchorage of the binder ends to the brackets by the seal-joints **26** will enable the assembly to be handled as a unit. When the assembled unit is fitted snugly against the face of the load unit, the attachment flanges of the brackets are nailed or screwed to the car side walls, and then the free ends of the binder sections are brought together,

tensioned and joined as before. In either event, pull of the binder under tension and shocks in transit is in the main not away from the car wall, but parallel to it. This reduces the tendency to pull out the bracket fastening with resultant loss of bracing effect and possible injury to the car. In the region where the binder is subject to the greatest shearing stresses, viz., at the anchoring brackets, it is of double thickness and as a result, the same effects with lighter strap can be attained. Of course, it will be understood that if the height of the load requires, several such braces or gates may be placed across the front face at different levels.

Although the modification shown in Figs. 5 and 6 acts and effects the same results, in general, as previously described, it differs in some respects and is more readily susceptible to still a different method of application which may under some conditions be deemed desirable. In this modification, the angular wall brackets are not depended upon to anchor the outer or wall ends of the tensioned binder; they serve only as cross-beam abutments. As most clearly shown in Fig. 6, each bracket has a flange **35** forming an abutment for the cross-beam **36** and a bifurcated attaching flange **37**. The anchored or wall ends of the load binder pass between the prongs **38** and **39** of the attaching flanges **37** of wall brackets associated with opposite ends of the cross-beam. Instead, however, of flange **37** being directly applied against and secured to the car side wall, it is fastened to a cleat **42**, preferably of wood, which in turn is attached to the car wall only in front of the face of the load unit. Holes **43** may be provided in the cleat for nails, screws or other appropriate wall fasteners. When properly positioned, the rear end **42***a* of this wall cleat should lie well to the rear of the front face of the load. The anchored end of the associated load binder section **44** is passed between the prongs **38** and **39** of flange **37**, then rearwardly between the end of cross-beam **36** and cleat **42**, back in the portion **44***a* over the rear end **42***a* of cleat **42**, forwardly in the portion **44***b* between the cleat and the car wall and around the front end of cleat **42** where its extreme end portion **44***c* is secured to the cleat by nails or screws **45**. Of course, the opposite end of the cross-beam is associated with a like bracket, cleat and binder section.

In a manner similar to that already explained, the tensioning of the free ends of binder sections **44** creates a rearward pull upon cross-beam **36** to compress and tightly hold the load unit therebehind, notwithstanding the fact that the anchoring cleat is positioned after the load is in place and is secured to the car wall only in front of the face of the load unit. The cross-beam and its associated brackets, cleats and binder sections may be applied in either of the ways heretofore explained. They, however, lend themselves particularly well to another method of application. Thus, the cross-beam may be secured to the brackets, the brackets may be attached to the associated cleats, the outer ends of the binder sections anchored thereto and the inner or free ends of the binder sections joined together (or, if desired, a single binder section anchored at both ends may be used) before any part of the gate assembly is positioned. The binder length between brackets should be only slightly greater than the length of the cross-beam. With the load unit in place and the gate thus assembled, the cleat on one side of the car

is applied by inserting its rear end between the load and the car wall and, when the beam is against the front of the load, there anchored to the car wall by nails or screws driven through its forwardly extending end. Then the rear end of the cleat on the opposite side of the load unit (it may be termed the loose cleat or anchorage) is inserted between the car wall and the load and pushed back, preferably by means of an appropriate tool. As the loose cleat is forced back, it pulls rearwardly upon the binder, which is fixed to the opposite car wall, and serves thus to tension it and thereby force the end of the cross-beam tightly against the load. When the desired binder tension is attained, the loose cleat is anchored to the car side wall in front of the forward or doorway face of the load unit. This method of application permits of the creation of inward or backward pressure toward the end of the car.

The attachment of the anchoring brackets to the car side walls in front of or beyond the doorway end of a load unit affords important advantages under some conditions. Thus, for example, in cases where the packages to be loaded are of varying sizes or the number desired to constitute a load unit is not known in advance, better bracing without waste of binder material may be insured because of the ability to defer attaching the brackets until after the load is in place. Relocation of anchorages because load units have not filled a car end to the extent expected is obviated. Frequently only partial car loads of varying dimensions are loaded at different shipping points and it is necessary to complete a full car by succeeding additions. Or the reverse may be the case, viz., that the contents of an initially full car must be unloaded by increments at different way stations. Both of these shipping problems are simplified by being able to brace each increment or sub-unit of load successively after it has been positioned and also successively to remove the several sub-loads without disturbing the remainder. The several sub-divisions of load for each end of the car are readily segregated both in loading and in unloading and shock is rather effectively distributed instead of being concentrated upon the end packages. Another advantage is that the vertical location of the cross-beam which is best for a particular load can be deferred until after the load is in, and its most effective position, considering the disposition, strength and character of the objects, can be determined.

Having illustrated and explained the nature and typical embodiments of my invention, what I claim and desire to secure by United States Letters Patent is as follows:

1. A brace for retaining a load unit in one end of a box car comprising a cross-beam extending across the car from side to side in front of the load unit, a metallic bracket for each end of the beam, each bracket having two angularly related flanges one of which lies along and is for attachment to the car side wall in advance of the load unit and the other of which lies substantially perpendicular to the car side wall and forms an abutment for one end of the cross-beam and each bracket having a pair of aligned binder receiving openings, one in the attaching flange and the other in the beam abutment flange, the latter forming a binder bearing surface to the rear of the rear face of the cross-beam when the beam is against the abutment flange thereof, and a pair of flexible metallic binder-sections, each

having one end anchored to a car side wall by being passed between an end of the beam and the attachment flange of the bracket, through the bracket opening forming the binder bearing surface, between the bracket attaching flange and the car wall, outwardly through the opening in the bracket attaching flange and then returning back between the car side wall and attaching flange again through the opening in the abutment flange and then forwardly between the end of the beam and the attaching flange of the bracket, and means for securing the return end of the binder-section to the body thereof to secure the anchorage thereof to the bracket and car side wall so that the other ends of the two binder-sections can be brought together in front of the load, tensioned and joined.

2. A gate for retaining a load unit in position in a box car comprising a cross-beam extending across the car from side to side in front of and against the face of the load unit, a flexible tensioned binder extending across the car in front of the cross-beam, and a wall anchorage for each end of the binder for securing the ends of the binder immovably to the car walls, each of said anchorages having a portion extending forwardly of the load unit for attachment to the car wall in front of the load unit and a portion lying to the rear of the front face of the cross-beam and over which said portions the associated end of the binder is trained and further trained over said anchorage portion lying to the rear of the front face of the cross-beam in overlapped relationship with respect to the first portion of the binder end, after passing between the end of the beam and the anchorage.

3. A brace for retaining a load unit in one end of a box car comprising a cross-beam extending across the car from side to side in front of the load unit, a metallic bracket for each end of the beam, each bracket having two angularly related flanges one of which lies along and is for attachment to the car side wall in advance of the load unit and the other of which lies substantially perpendicular to the car side wall and forms an abutment for one end of the cross-beam and each bracket having a pair of aligned binder receiving openings, one in the attaching flange and the other in the beam abutment flange and forming a binder bearing surface to the rear of the rear face of the cross-beam when the beam is against the abutment flange thereof, and a pair of flexible metallic binder-sections, each having one end anchored to a car side wall by being passed between an end of the beam and the attachment flange of the bracket, through the bracket opening forming the binder bearing surface, between the bracket attaching flange and the car wall, outwardly through the opening in the bracket attaching flange and then returning back between the car side wall and attaching flange again through the opening in the abutment flange, and means for securing the other ends of the two binder-sections together in front of the load in tensioned relation.

JOHN M. MOON.