Jan. 10, 1950 G. W. RYDNER ET AL 2,494,004

LADING IMPACT ABSORBER

Filed Feb. 6, 1947 2 Sheets-Sheet 1

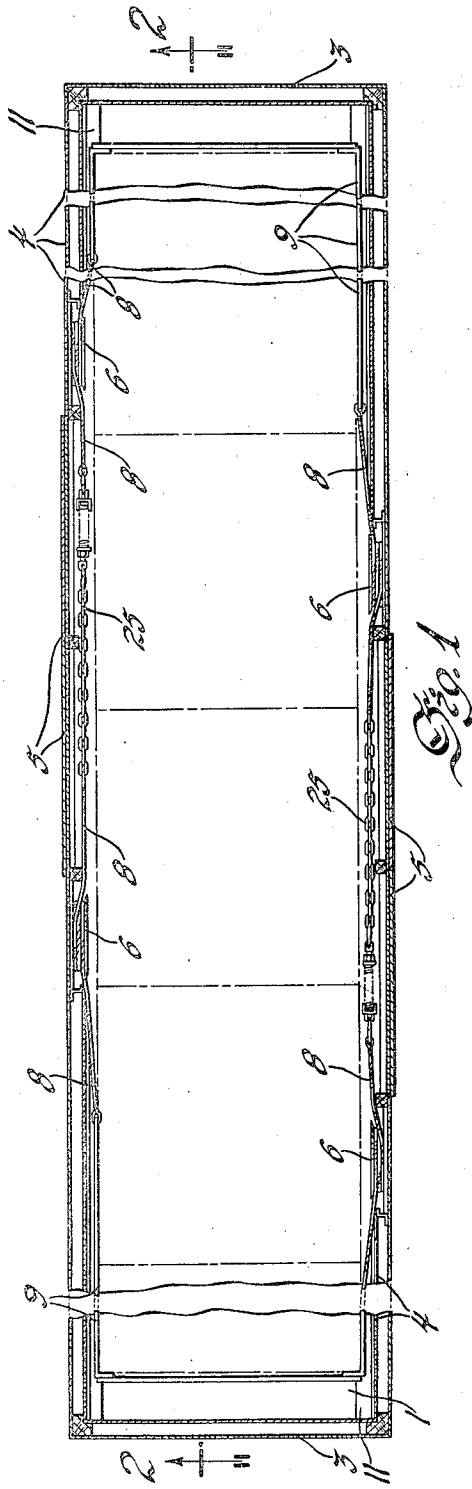


Fig. 1

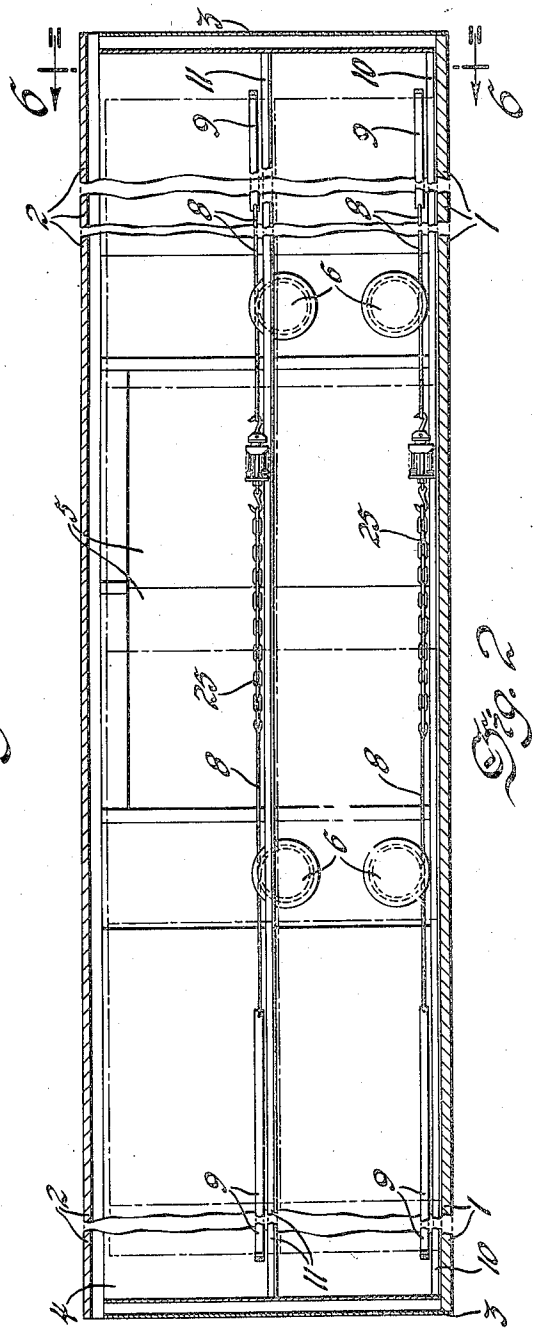


Fig. 2

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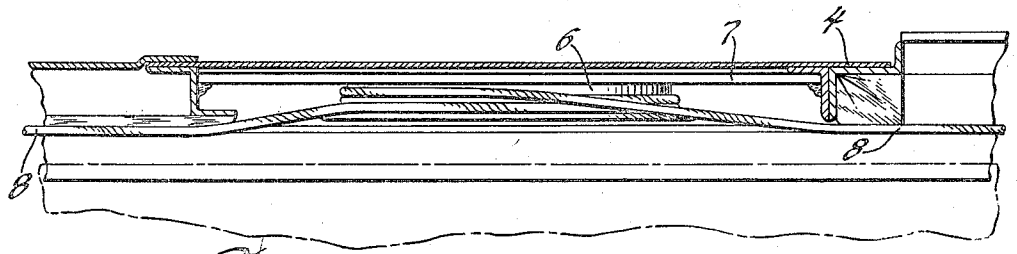



Fig. 3

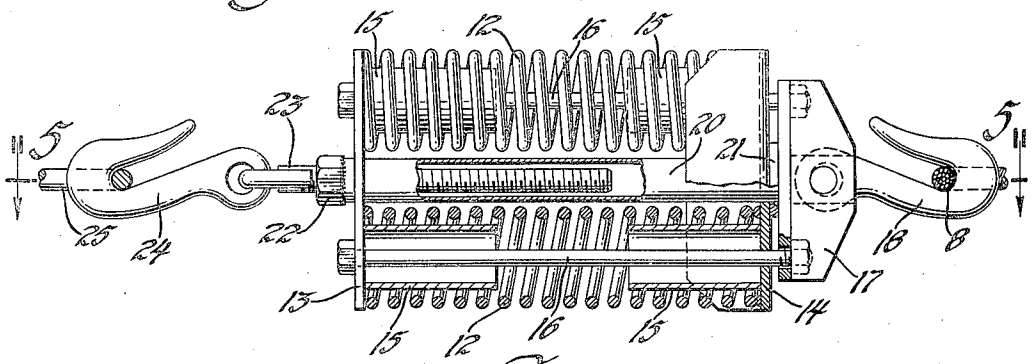



Fig. 4

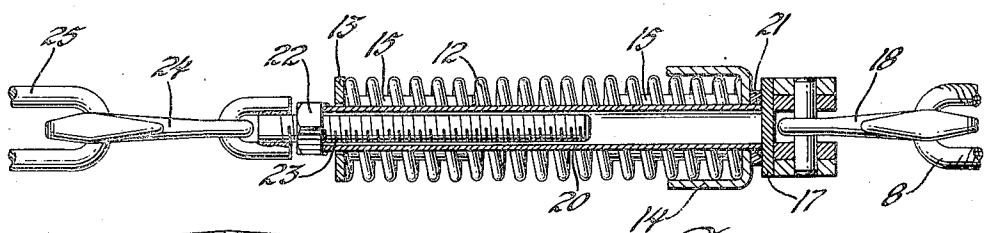



Fig. 5

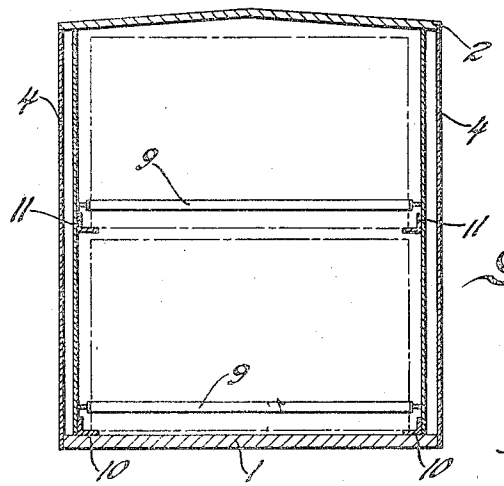



Fig. 6

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# UNITED STATES PATENT OFFICE

2,494,004

## LADING IMPACT ABSORBER

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7 Claims. (Cl. 105—369)

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In the shipment of freight, especially in railroad cars, there has always existed the difficulty of properly packing the cargo to minimize damage due to rough handling in transit. The troubles are increasing with the use of new railroad equipment for moving trains at higher speeds and for the faster switching in the freight yards in that momentum forces on rapid changes in acceleration, including sudden stops, create more severe bumps and jolts. Various arrangements for floating the load in the railroad car have been used and one of the standard methods now found to be less dependable has involved placing the lading on the car floor in spaced relation to the car walls and then encircling the same with steel strapping so that one or more straps pass around all four sides of the cargo and are fastened to one side wall near the centrally located entrance door opening with other strapping fastened to the opposite side wall whereby on impact the load may slide on the car floor within a limited range allowed by any slack or stretching of the strapping and slippage of the straps about the load. Such strapping generally is discarded after one use and the installation is rather expensive with respect to both material costs and the amount of labor required.

It is here proposed to provide an improved snubbing structure for a shiftable load and which structure is a permanent installation in the box car for repeated use indefinitely with any kind of cargo, including boxes, barrels, cartons, pallets and containers. In principle the opposite ends of the load are joined together in a preferred embodiment with flexible lengths of rope along each side which are slidably looped over fixed drums for a friction braking action when the load slides. Hence the faster the sliding the tighter the loop grabs the drum so that the frictional resistance is somewhat proportional to the moving force. By preference an adjustable spring assembly is incorporated for holding the rope under the right tension for controlling the amount of friction around the drum in accordance with the weight of the load and the operating conditions to be encountered.

With the springs set at the selected tension the individually loaded items of cargo will be pulled tightly together into one compactly fitting unit and will float as one. The amount of shifting as now contemplated is only a matter of a few inches and calls for a minimum of clearance distance between the cargo and the ends of the car. For light loads lesser float needs to be allowed than for heavy loads. Inasmuch as the

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bumps to which a railroad car is subjected during travel are not always in the same direction a properly loaded floating load as here contemplated is found to even itself out and generally to arrive at its destination at practically the same place in the car as when it was loaded.

For a more complete explanation reference will be made to the accompanying drawings wherein Figure 1 shows in plan the cargo in a freight car snubbed according to the present invention; Figure 2 is a vertical section of the freight car body as on line 2—2 of Figure 1; Figure 3 is a detail sectional view of a portion of a freight car side wall having pocketed therein one of the friction snubber drums about which a tie cable is wrapped; Figure 4 is an elevation, partly in section, of the adjustable spring assembly; Figure 5 is a section on line 5—5 of Figure 4 and Figure 6 is a transverse section through the freight car as on line 6—6 of Figure 2.

In the drawing the freight car body is illustrated as comprising the floor 1, the ceiling 2, a pair of end walls 3—3 and a pair of side walls 4—4, each of the latter having a centrally located opening closed by doors 5. On the interior of each side wall 4 and on opposite sides of the door opening there are located the snubber devices or drums 6—6 set within the inside lining so as to be flush therewith and not to project into or otherwise interfere with the loading space. Each drum is stationarily mounted on a bar 7, whose opposite ends are welded or otherwise secured to adjoining vertical car posts and the drum terminates in a peripheral flange to assist in retaining thereon a coil or loop of one or more turns of flexible cable or rope 8.

One end of each rope is fastened to an adjoining end of a side arm of a U-shaped steel strap 9 which fits around in nested relation with an end and on opposite sides of the cargo, there being one U-shaped strap at each end of the load. If desired the U-shaped members 9 may be eliminated either by running the cables around the ends of the cargo in place of the strap or by fastening the ends of the respective cables 8 to the endmost cargo item. For illustrative purposes the cargo items are indicated by broken lines as a series of box-like containers, each of substantially the width of the car and of half the height and arranged in two tiers, those in the lower tier resting on longitudinally disposed angle shaped tracks 10 resting on the car floor 1 and those of the upper tier resting on angle straps 11 supported on the side walls midway of

the height. Additional tracks may be provided in spaced sets where the height of the containers permits multiple tiering of the load and, of course, all but the floor tracks may be eliminated, if the height of the load occupies the major vertical space in the transport carrier.

The spring assembly heretofore mentioned for the purpose of taking up slack in the snubber cables joins together the adjacent ends and is arranged to be located conveniently for accessibility through the centrally disposed door opening at each side. As best seen in the detail views the assembly includes a pair of coil springs 12—12 seating at opposite ends on plates 13 and 14 to urge the plates apart. Bottoming tubes 15—15 carried by each plate in spaced apart relation are nested within each coil spring and provide abutments to limit the extent of spring compression. Long bolts 16 seat on the plate 13 and project slidably through the coil springs and the plate 14 and are fastened by suitable nuts to an attachment member 17 carrying a hook 18 for attachment to one of the snubbing cables 8. Centrally of the pair of springs there is located a hollow tube 20 having an abutment washer 21 welded at one end for pulling contact with the spring seating plate 14. Its opposite end projects slidably through the other spring seating plate 13 and has welded thereto a threaded nut 22 in which is adjustably fitted a threaded stud 23 carrying a hook 24 for engagement by selected links of a chain 25 carried on the end of the other cable 8 of the cooperating set. The selective fitting of the various chain links detachably to the hook 24 accommodates variations in the overall length of the cargo in setting up the tautness in the snubbing cable. Further adjustment is provided by threading the stud 23 into or out of the tube 20. Thus the correct amount of spring tension may be set up after the loading is completed in accordance with the desired amount of friction between the cable loops and the snubber drums. Shifting of the load in either direction will tend to pull both of the intermediate lengths of cable about their respective drums, the movement being permitted by the slippage of the cables with the friction drag serving to check the relative movement. Small relative movement under light force can take place with a smaller degree of frictional resistance whereas sudden heavy forces cause an even tighter wrapping of the cables and, consequently, quicker checking of the tendency of the load to be displaced. It may be feasible for certain types of load to eliminate the adjustment feature and to employ an endless cable loop of predetermined size for completely encompassing the four sides of the load and entrainment over one or more snubbing devices. However, the structure as illustrated has been devised for universal use employing a minimum of dunnage parts for permanent railroad car installation.

We claim:

1. In the shipment of freight, a transport carrier having means to shiftably support a cargo load, friction snubber drums permanently mounted and non-rotatably fixed at each side of the transport carrier, cargo load embracing means comprising portions engaging opposite ends of the load and portions extending in tension between opposite ends of the cargo load on both sides thereof, said last mentioned portions intermediate their length on each side of the load including a flexible cable having at least one encircling loop wrapped around a friction snubber drum for sliding friction cooperation therewith and an adjustable spring take up device joined to the cable for yieldably maintaining the cable under tension and in snug wrap around engagement with the drum, said device being adjustable to vary the spring preload in relation to the weight of the particular cargo load.



2. In a transport carrier, load snubbing means for permanent installation in the carrier including means to support a cargo shiftably relative thereto, a snubbing drum permanently pocketed within the wall lining of the carrier and provided with a circumferential cable retaining groove and a check line fixed at opposite ends to the cargo and looped intermediate said ends about said snubbing drum and within said circumferential groove.

3. For repetitive use and permanent installation in a transport carrier for shiftably supporting cargo, a pair of U-shaped devices to telescopically embrace opposite ends of the cargo with the side arms of one projected toward the side arms of the other, flexible cables joining said arms on each side, and snubber drums mounted on the carrier and entrained by encircling loops in said cables for frictional sliding engagement thereby.

4. The structure of claim 3 wherein a slack take up device automatically maintains cable tension.

5. In combination, a transport carrier having snubber drums fixed to both side walls thereof, tension banding means to encircle the cargo loaded shiftably within the carrier, said means including intermediate side lengths of flexible cable looped about said snubber drums on both side walls and slack take up devices to maintain tautness in the banding means.

6. In combination, a transport carrier to support a shiftable cargo having in both side walls a pair of longitudinally spaced snubber drums, cargo banding means including flexible lengths of cables, one on each side of the cargo and each looped around both drums on the corresponding side of the cargo and connections at opposite ends of each cable to hold said cable ends fixed in relation to the opposite ends of the cargo, said cables between each pair of drums extending toward one another and being joined together by a tensioning spring to insure close fit of the cables with the snubber drums.

7. The structure of claim 6 wherein the tensioning spring is located between relatively adjustable seats for a predetermined setting of tension force in accordance with the weight of the cargo load.

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