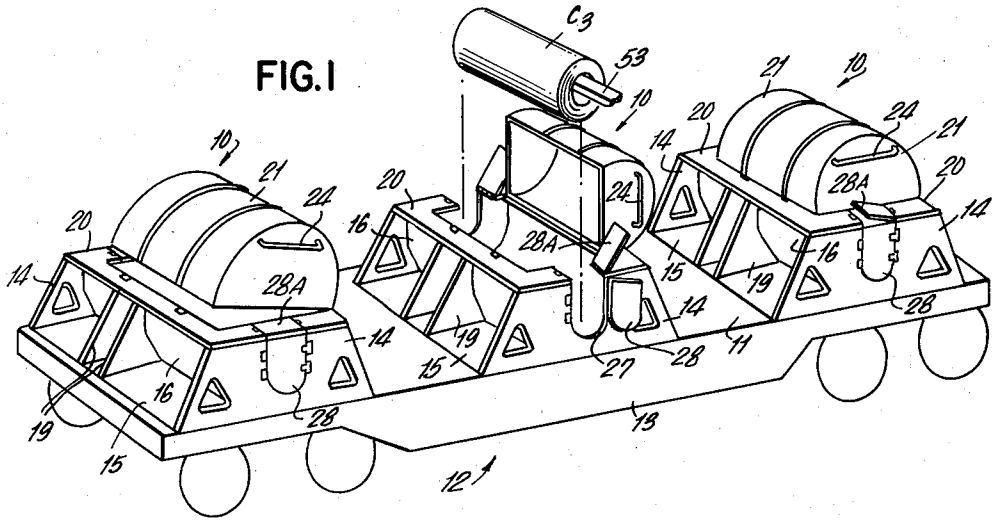
Oct. 30, 1962 J. R. GALLO ET AL 3,061,255

COIL PALLET

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FIG. 1



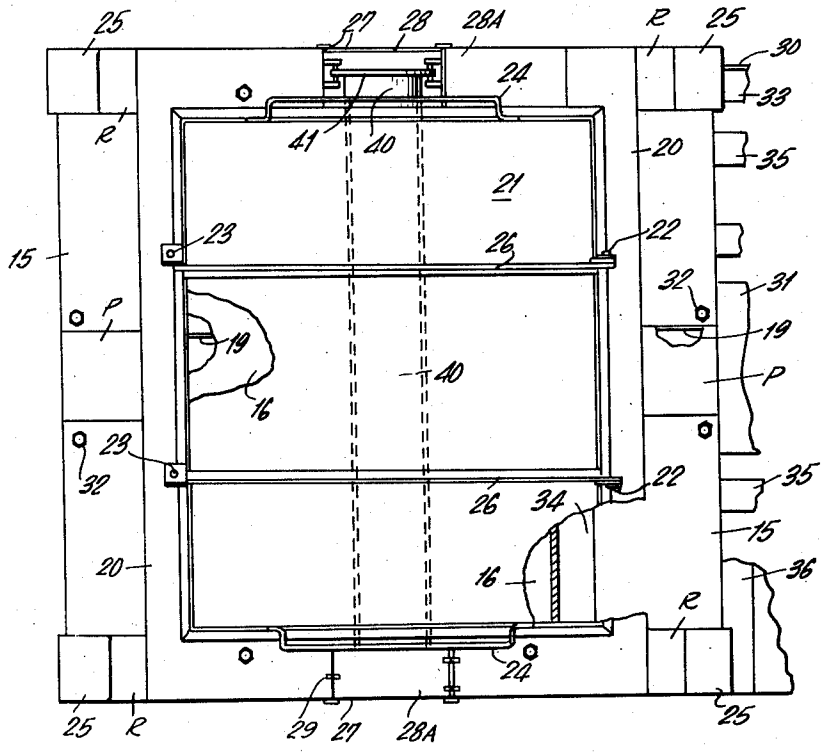


FIG. 2

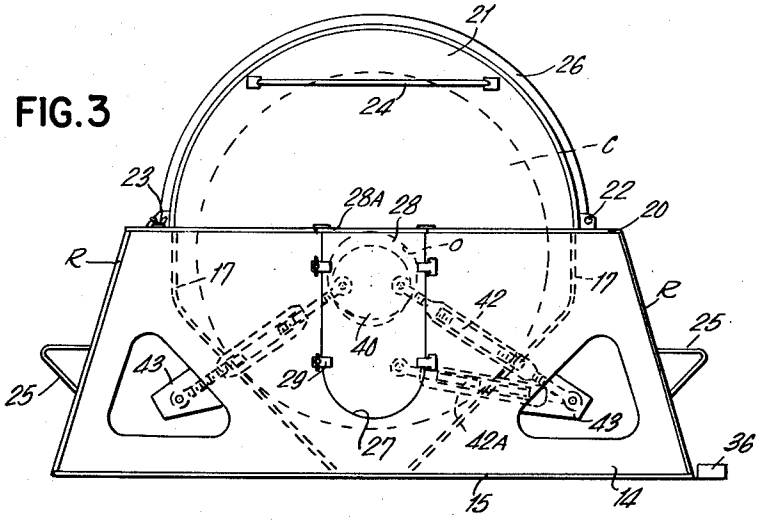
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COIL PALLET

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FIG. 3



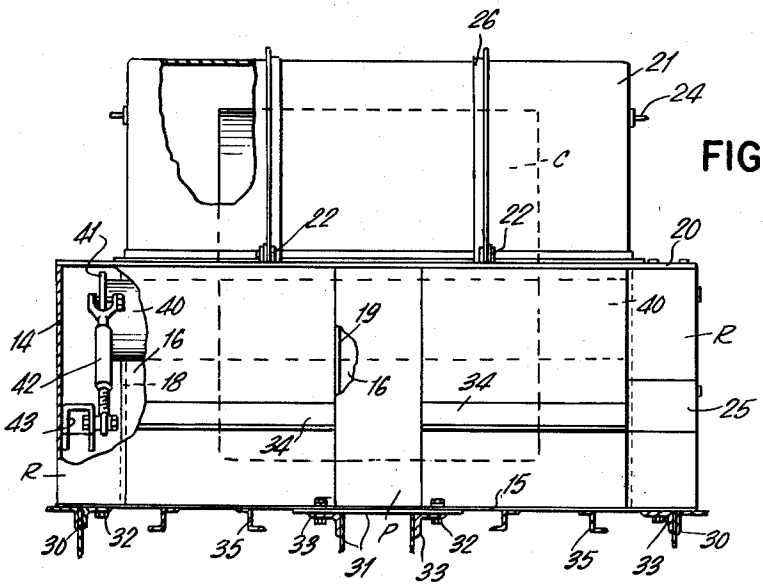


FIG. 4

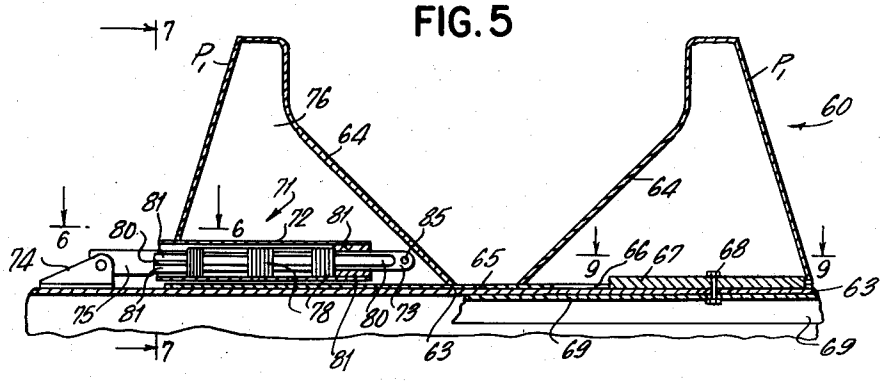
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FIG. 5



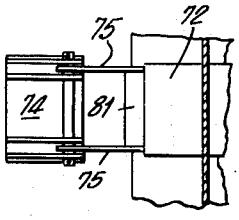


FIG. 6

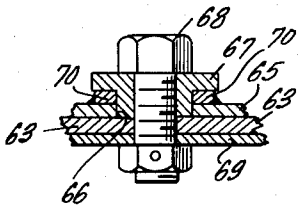


FIG. 11

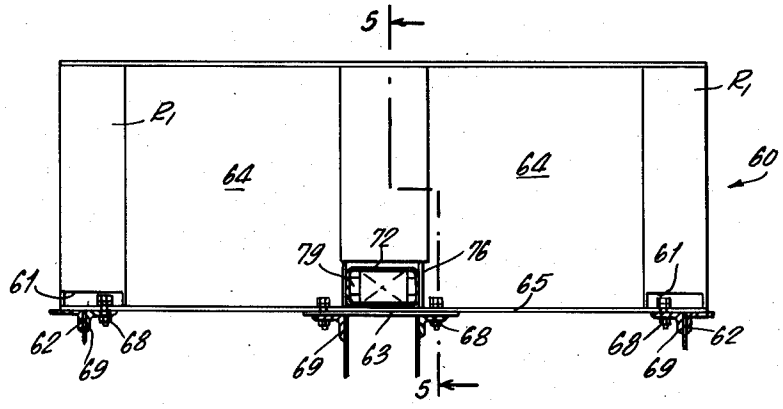


FIG. 7

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FIG. 9

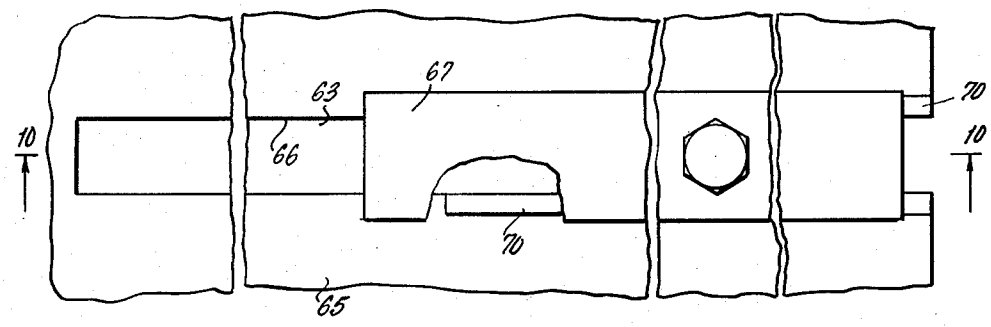
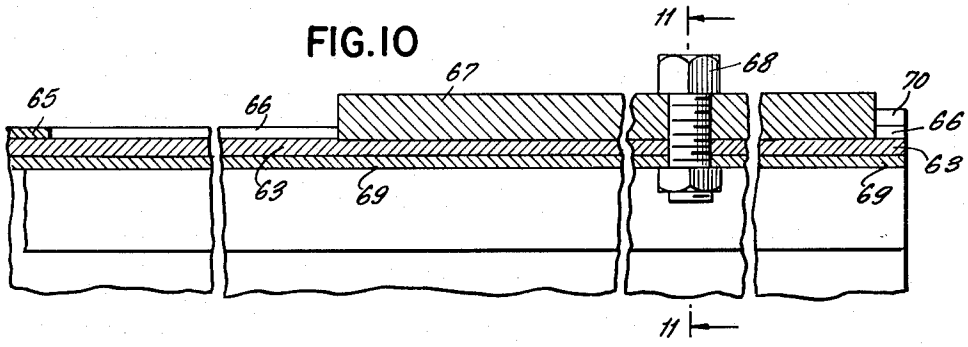


FIG. 10



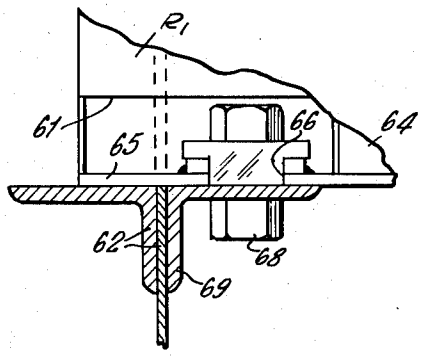
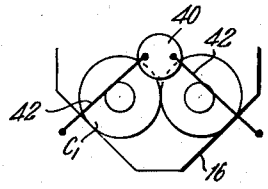
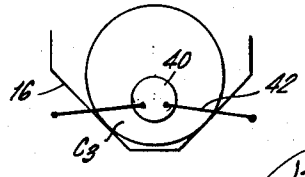


FIG. 8

FIG. 13

FIG. 12





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3,061,255

COIL PALLET

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Filed Mar. 15, 1960, Ser. No. 15,133
7 Claims. (Cl. 248—119)

The present invention relates generally to the combination of a transport vehicle or device and a lading pallet for supporting metal coils and the like on the vehicle with the axes of the coils disposed transversely of the direction of travel of the vehicle or device. More particularly, the invention relates to a metal coil pallet adapted for attachment to the floor of a transport vehicle in transverse relationship thereto and providing coil hold-down means, and in one modification of the invention, resilient means connecting the pallet and floor for permitting and controlling relative longitudinal shock movement between the pallet and transport device.

The transportation of heavy sheet metal coils, used in the manufacture of tin cans, pressed objects and the like presents a number of problems. First of all, the metal coils are very heavy, weighing many thousands of pounds. Their weight plus their bulky character and their natural tendency to unwind, results in a lading problem where merely holding the lading down is difficult. This is particularly true when such coils are transported by railway cars where under ordinary circumstances longitudinal shocks of very great magnitude are common. These shocks together with the tremendous weight of this type of lading has many times resulted in the breaking of hold-down and bulkhead structures in the cars and in damage to the cars themselves. Moreover, damage to the ends of the coils has resulted in many thousands of dollars worth of damage liability. Even comparatively small cuts or indentations at the ends of such coils renders the material or a large part thereof worthless for most practical purposes.

The prior attempts, to solve the many problems in this area of the shipping art, have been in the direction of utilizing the weight of the steel coils to accomplish longitudinal stability of the lading. The idea was to place the coils in end to end relationship along the longitudinal center line of the car and to structurally hold fast the free ends of the coils to provide a solid longitudinally extending column. This arrangement demands extremely strong bulkhead structures at the ends of the column as well as separator means or further bulkheads between the damageable coil ends or between coils of different sizes. Longitudinally movable skids having resilient bumpers at their ends have been provided to lessen the effect of shock forces received at the ends of the transport vehicle and imposed by the entire lading column. Such arrangements result in the extremely heavy column of metal adding its impact forces to the already great longitudinal forces which occur in transport vehicles of the type needed to carry such heavy lading. Also, these prior art structures result in very difficult loading and unloading operations. So much so that coil skids sometimes comprise specially adapted containers which act as portable crates, requiring a great deal of preparatory packing before loading. Furthermore, in the railway shipping art, prior structures were conceived, in most instances, for crane loading on gondola cars, which offer end wall closure or protection for the metal coil lading. This greatly limits the available equipment for transporting metal coils and consequently increases freight costs but still leaves the coil ends subject to mechanical injury.

The present invention eliminates end to end, longitudinal loading of metal coils. By disposing the coils transversely of the direction of travel the load on the

car is divided into parts and coil end damage due to longitudinal shocks received in transit is eliminated. The invention further eliminates heavy and expensive bulkhead structures and permits facile loading and unloading operations by all types of loading equipment, and on railway flat cars, as well as in gondola cars where railway freight transportation is desired.

The downwardly converging lading retaining surfaces of the pallet of the invention are transversely disposed in relation to the floor of the pallet supporting transporter or vehicle. Their extension upwardly and the angle at which they are set coact to accommodate varying sizes of coils and provide stability against longitudinal movement of the coils within the pallet. Vertical stability is assured by hold-down means of very simple construction comprising, basically, a shaft to be inserted through the coils at their center openigns. Adjusting means connect the ends of the shaft to the walls of the pallet to permit the shaft to be lowered into a downwardly bearing relationship with the coils. The pallet of the invention also provides a weather protecting cover to eliminate the need for tarpaulins. Openings in the walls of the pallet permit the shaft to be easily removed and the fork of a lift truck, for instance, to be inserted for facile loading and unloading operations.

Other objects and advantages of the invention will become clear upon a reading of the following description with reference to the accompanying drawings of which:

FIGURE 1 is a simplified perspective view of a railway flat car mounting longitudinally spaced, transversely extending coil pallets and embodying the present invention;

FIGURE 2 is a more detailed plan view of one of the metal coil pallets mounted in the car of FIG 1;

FIGURE 3 is an end view of the pallet of FIG. 2;

FIGURE 4 is a side view of the pallet with parts partially broken away;

FIGURE 5 is a section partially broken away of a pallet embodying the invention and modified to include resilient means for permitting and controlling sliding movements of the pallet upon the floor of a transporter. The section is taken substantially along the line **5—5** of FIG. 7;

FIGURE 6 is a view taken along the line **6—6** of FIG. 5;

FIGURE 7 is a view taken substantially along the line **7—7** of FIG. 5;

FIGURE 8 is an enlarged view of the left lower hand corner of FIG. 7;

FIGURE 9 is a view taken along the line **9—9** of FIG. 5;

FIGURE 10 is a view taken along the line **10—10** of FIG. 9;

FIGURE 11 is a view taken along the line **11—11** of FIG. 10, and;

FIGURES 12 and 13 are schematic sketches showing various sizes of coils being retained in the pallet of the invention.

FIGURE 1 shows three metal coil pallets **10** secured to the planked deck **11** of a railway flat car **12**. Each pallet extends transversely of the deck from one side sill **13** thereof to the other. The end walls **14** of the pallet are formed with downwardly diverging front and rear edges and are connected at their lower edges by a base plate **15** extending the width of the car.

Lading retainer plates **16**, comprising a pair of downwardly converging walls, having upper portions **17** extending vertically, extend between the end walls but are discontinued at their ends inwardly of the end walls where they are supported by gussets **18**. The gussets extend from the outer surfaces of the retainer plates **16** to the base plate and transversely of the pallet to their edges which are sloped co-extensively with the diverging

edges of the end walls. The lower edges of the converging retainer plates are secured along the base plate on either side of the longitudinal center line thereof. Cushioning pads (not shown) may be spaced over the lading surfaces and along the base plate to provide a further protection for the lading.

Front and rear reinforcement gussets **19** having inclined edges corresponding to the front and rear edges of the end walls connect the base plate and the outer surfaces of the lading retaining walls intermediate their ends. Reinforcement plates P connect the outer sloping edges of the gussets. A rectangularly shaped frame **20** completes the body of the pallet and is supported by the upper edges of the end walls and gussets at its outer edges and adjacent undersurfaces, and by the upper edges of the vertically extending upper portions of the lading retaining plates at it longitudinally extending inner edges. A pair of transversely spaced, downwardly sloped plates **34** are connected along their upper inner edges to the outer surface of each support wall, intermediate the wall upper and lower edges. They are connected to the wall end and intermediate gussets, and assist in directing forces, received along the height of the wall, to the car underframe.

A water shed cover **21** is hinged by bracket and pin assemblies **22** to the frame and suitable latch means **23** are provided at the edges of the frame and shed opposite the edges thereof providing the bracket and pin assemblies. The frame is circumferentially larger than the cover and horizontally disposed to form a catwalk thereabout. Grab rails **24** are provided at the ends of the covers to assist workmen in passing from one side of the pallet to the other. Step angles **25** extending at the front and rear of the pallets provide further assistance in this respect and are secured to reinforcement plates R which extend at each corner of the pallet between the outer edges of the retainer wall end gusset, the end wall, the base plate and the frame. The water shed covers are shaped to cover their intended circular lading and are reinforced by semi-circular ribs **26** which provide attachment on the cover for the bracket and pin hinge assemblies at one end and for the latch means **23** at the other.

Each pallet provides cutout portions **27** extending centrally of the end walls and through the end pieces of the frame, downwardly to a point spaced above the base plate. This cutout portion is normally covered at the end wall section by suitable hinged closure means **28** and by similar closure means **28A** at the cutout section in the frame ends. Suitable latch means **29** are provided for the closures at the edges thereof opposite the hinged edges.

The pallets are attached by their base plates to the side sills **30** and center sill **31** of the railway car by bolts **32** connecting the plate and angle members **33** which extend longitudinally of the car and are secured to the sills. This connection is shown in FIG. 4. Longitudinally **Z** shaped stringers **35** are also shown in FIG. 4 as underlying and supporting the pallet. The direct connection to the underframe structure of the car results in the planking **36** (FIG. 3) of the deck extending above the base plate. It should be understood that the pallets may be secured to the deck of existing cars as well.

The cutout portions in the ends of each pallet provide access to the ends of a transversely disposed lading hold-down shaft **40** which extends from one end of the pallet to the other. Integral circular flanges **41** comprise the terminal ends of the shaft. Attached to either end flange, on either side thereof and supporting the same, is the yoked end of a turnbuckle connection **42** to the inner surfaces of the pallet end walls. The turnbuckle connections extend from their bolt attachment to the flange to a similar connection to a channel member **43** which in turn is secured to the inner surface of the pallet end wall. This arrangement makes the lading hold down or bearing shaft adjustable for different sizes or coils. In FIGURE 3 the turnbuckle connection **42A** indicates the same turnbuckle connection **42** in a lowered position.

FIGURES 3, 4, 12 and 13 show the manner in which various sizes of cylindrical metal coils are supported and held down by the pallet of the invention. In FIGS. 3 and 4, a large cylindrical coil C is shown with portions of its outer circumference resting upon the inclined lading surfaces of the pallet retaining walls. Extending through its center opening O is the bearing shaft which has been adjusted by means of the turnbuckle connections to bear downwardly against the inner circumference of the opening. The support walls restrain longitudinal rolling movement of the lading relative to the direction of travel and with the vertical extensions thereof it will be noted that the coil retention extends upwardly to or above a horizontal plane common with the center of gravity of the largest coil which the pallet is capable of holding.

FIGURE 12 shows a suggested position for two small coils C_1 where portions of their outer circumferences would be retained by the support surfaces and each coil would abut the other along the longitudinal center line of the pallet. In such a case, the turnbuckle may be extended and the lading bearing shaft could be moved above the point of abutment and made to bear against both coils as shown in the figure. In any case the shaft will bear on the coil along a line parallel to but spaced from the axes of the coils or lading.

FIGURE 13 shows a small coil C_3 resting on lower portions of the lading bearing surfaces with the turnbuckle correspondingly adjusted to accommodate a lowered bearing shaft position. The turnbuckles **42** and coils in FIGS. 3, 12 and 13 are shown diagrammatically to show the flexibility of the pallet and hold down means and it is readily seen that many combinations of coil positions can be accommodated. It should be understood that the hold down shaft is basically a safety feature, the form of which can be readily changed. In most instances the hold down will not be needed as the cylindrical lading is cradled by the retaining plates.

When loading and unloading the coils, the arrangement shown is such that the water shed cover is swung open on its hinges and the closures **28** and **28A** are also opened. The bearing shaft is removed and the turnbuckle connections swung away from the center of the pallet or permitted to lie with their free ends on the base plate. In FIG. 1, the coil C_3, supported at its center opening by the prong **53** of a lift truck is lowered into the pallet. The cutout portions at the ends of the pallet provide access for the prong all the way down to the loaded position of the coil. The prong is then withdrawn, the shaft is inserted to bear against the coil and the turnbuckle connection is so adjusted. Unloading is accomplished with equal facility by a reverse operation.

FIGURES 5 through 11 show a modification of the invention. The pallet **60** extends transversely of the deck of a railway car and is supported for frictional movement thereupon. Its connection along its ends and centrally thereof to the side sills **62** and center sill top plate **63** is such that it permits the pallet to slide along the underframe structure when longitudinal shocks are received at the ends of the vehicle.

The base plate **65** of the pallet provides elongated slots **66** (FIG. 9) at its ends and at its central portion on either side of the car center line over the top plate **63** of the center sill. These slots extend longitudinally or in the direction of travel of the car from the front and rear edges of the base plate inwardly toward the lading retaining walls **64**. A guide bar **67** extends within and along a part of the length of each slot. It provides a hole for receiving a nut and bolt assembly **68** and an upper bearing surface for the head of the bolt. The lower end of each bolt is received by a sill angle member **69** extending longitudinally of the car. The angle members connected along the side sills directly underlie and support the base

plate while those on either side of the center sill underlie the sill top plate **63** which underlies the base plate and provides openings on either side thereof to receive the bolts of the forward and rear guide members. The nut of each assembly is tightened upwardly on the bolt to bear against the undersurface of the horizontal leg of its associated angle member. Each guide bar is T-shaped in cross section with the upper lateral extensions overlying separator strips **70** which are secured to the base plate and extend adjacent the slot edges for a length equal to the length of the bar. The arrangement of the guides and pallet is such that the car and guide bars are held stable, relative to one another, while the separator strips and pallet are permitted movement longitudinal of the car in guided straight line directions.

The reinforcement gussets R_1 at the front and rear end edges of the pallet serve the same purpose as those R of the pallet of FIGS. 1–6. They may be cut away as indicated at **61** in FIG. 7 to permit unobstructed relative movement of the guide bar ends past the front and rear sides of the pallet. Alternately the slots and guides may be set inwardly of the pallet sides for operation within the confines of the pallet structure. (This arrangement not shown.)

The pallet is connected centrally at one of its sides to the center sill top plate by means of a resilient shock absorbing device **71** (FIGS. 5–7). The device comprises two longitudinally extending elements, one a box like casing **72** the other a yoke **73** which, in assembly extends within the casing. The casing is attached to the top plate by means of a bracket and pin assembly **74** connecting the ends of two extensions **75** from either side of the casing. The yoke is connected at its end, by pin means **85** for instance, to the intermediate reinforcement gussets **76** of the retainer wall **64** and adjacent the wall. Interposed between the elements is a resilient pad and spacer assembly **78**. The assembly rests upon the floor of the casing and is transversely retained by centering plates **79** attached to either side of the casing. The yoke and the casing both provide stops such as indicated at **80** and **81** at both ends of the assembly so that the device will resist movement of the pallet in either longitudinal direction.

The reinforcement plates P_1 connecting the intermediate gussets along their outward diverging edges at the resiliently connected side of the pallet is discontinued at its bottom portion to accommodate the height of the resilient device.

The resilient device and the slotted connection of the modified pallet to the floor permits and controls longitudinal movement of the pallet in response to shocks received at either end of the transport vehicle and in a direction at right angles to the axes of the cylindrical lading. The frictional engagement of the floor and pallet act to absorb much of the permitted movement so that jarring of the lading due to initial impact is minimized. The resilient means is preloaded to accommodate the expected forces attendant with transporting metal coils and the like.

It will now be seen that the invention provides a pallet for transporting cylindrical metal coils or lading with their axes disposed transversely of the direction of travel. The pallet transmits horizontal forces to the transport vehicle over a large area by virtue of its wide base and retention of the coils in the plane of or above their centers of gravity. End damage to coils due to longitudinal shock forces is eliminated and facile loading and unloading operations are provided as well as versatile support for various sizes of coils. Resilient control of permitted longitudinal movement of the pallet due to end shocks and the like is also provided by the pallet of the invention.

Those skilled in the art will be able to utilize the present invention in various ways and it is not meant to limit the scope and spirit of the invention to the specific embodiment described and shown. The spirit and scope of the invention is limited only by the following claims.

What is claimed is:

1. In combination, a transport device adapted to travel in a longitudinal direction, a lading pallet for receiving cylindrical lading having axes disposed in horizontal planes and extending transversely of the direction of travel of said transport device, said lading pallet comprising, a base supported on said transport device to travel therewith, plates diverging upwardly from said base and providing lading receiving surfaces, gussets bracing said upwardly diverging plates, hold down means connected to the pallet, and a shaft means connected to said hold down means for bearing on the cylindrical lading along a line parallel to the axis thereof but in spaced relation thereto, whereby the cylindrical lading may be held on said lading receiving surfaces.

2. In combination, a transport device adapted to travel in a longitudinal direction, a lading pallet for receiving cylindrical lading having axes disposed in horizontal planes and extending transversely of the direction of travel of said transport device, said lading pallet comprising, a base supported on said transport device to travel therewith, plates diverging upwardly from said base and providing lading receiving surfaces, gussets bracing said upwardly diverging plates, vertically extending plates connected to the upper edges of each of said diverging plates and extending upwardly therefrom, hold down means connected to the pallet, a shaft means connected to said hold down means for bearing on the cylindrical lading along a line parallel to the axis thereof but in spaced relation thereto whereby the cylindrical lading may be held on said lading receiving surfaces, and a lid hinged to said pallet adjacent the upper edge of one of said vertically extending plates and protecting the cylindrical lading.

3. In combination, a transport device adapted to travel in a longitudinal direction, a lading pallet for receiving cylindrical lading having axes disposed in horizontal planes and extending transversely of the direction of travel of said transport device, said lading pallet comprising, a base supported on said transport device to travel therewith, plates diverging upwardly from said base and providing lading receiving surfaces, vertically extending plates connected to the upper edges of each of said diverging plates and extending upwardly therefrom, said vertically extending plates and diverging plates forming a cradle for reception of the cylindrical lading, gussets connecting said plates to said base to support the cylindrical lading, and a lid hinged to said pallet adjacent one of said vertically extending plates, said lid when closed protecting the cylindrical lading.

4. The structure of claim 1 characterized in that said base is slidably supported on said transport device, and resilient means is provided and is interposed between said pallet and said transport device to resiliently cushion relative sliding movement between said base and said transport device during travel thereof.

5. The structure of claim 1 characterized in that said base is slidably supported on said transport device and said pallet includes, resilient means having a portion connected to said pallet, and a portion connected to said transport device, and said resilient means controls relative sliding movement between said pallet and said transport device in a direction at right angles to the axis of the cylindrical lading.

6. The structure of claim 1 characterized in that said pallet further comprises, end walls connected to said pallet in spaced relation to the end edges of said plates, whereby the ends of the cylindrical lading will be free of contact with any portion of the pallet, said end walls providing weather protection for the lading and preventing tampering with said hold down means.

7. In combination, a transport device adapted to travel

in a longitudinal direction, a lading pallet for receiving cylindrical lading having axes disposed in horizontal planes and extending transversely of the direction of travel of said transport device, said lading pallet being supported by said transport device to travel therewith, and lading retaining means connected to said pallet for receiving the cylindrical lading, said lading retaining means including, a pair of upwardly diverging lading receiving surfaces, a vertically extending wall connected to the upper edge of each of said upwardly diverging surfaces, spaced apart end walls, each end wall including first parts connected to the adjacent ends of said diverging surfaces and vertically extending walls, and each end wall also including second parts spaced from said first parts and formed with upwardly opening slots giving access to the axes of the cylindrical lading, said lading retaining means also including, hold down means pivotally connected to said second parts, and a hold-down shaft connected to said hold down means for engaging the cylindrical lading parallel to the axes thereof.

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