

March 17, 1964

J. E. LOOMIS

3,125,035

FREIGHT HANDLING MEANS

Original Filed April 9, 1956

4 Sheets-Sheet 1

FIG. 1

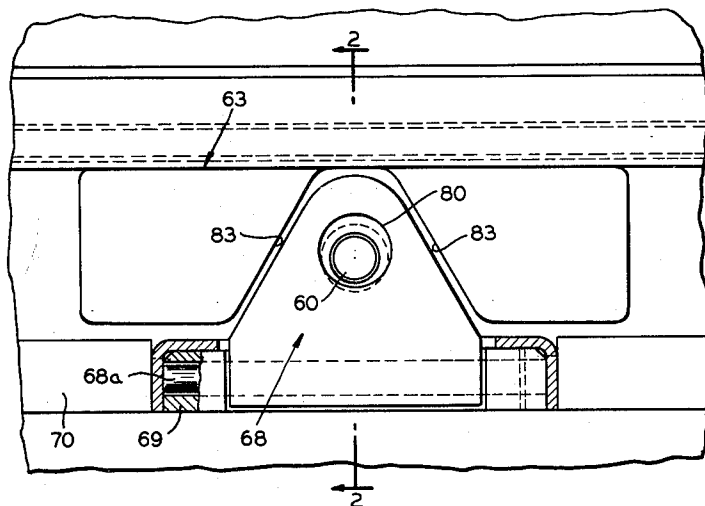
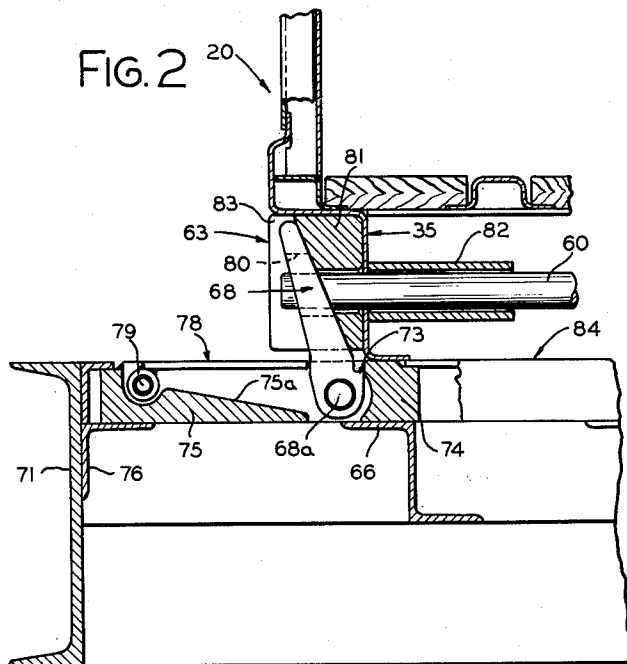


FIG. 2



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FIG. 3

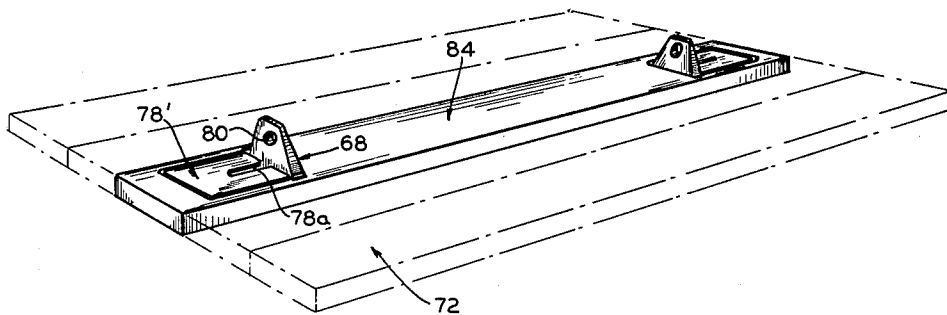


FIG. 5

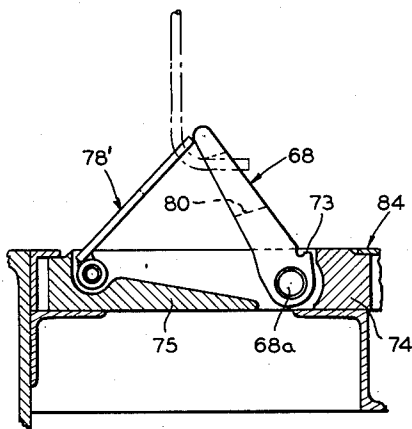
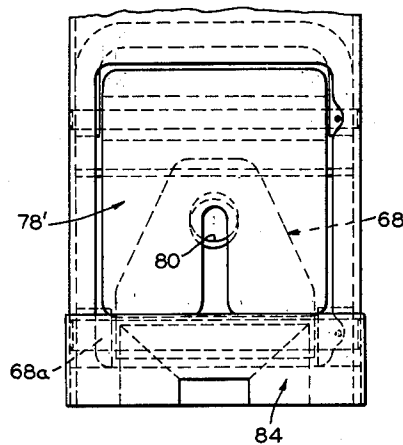


FIG. 4



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FIG. 7

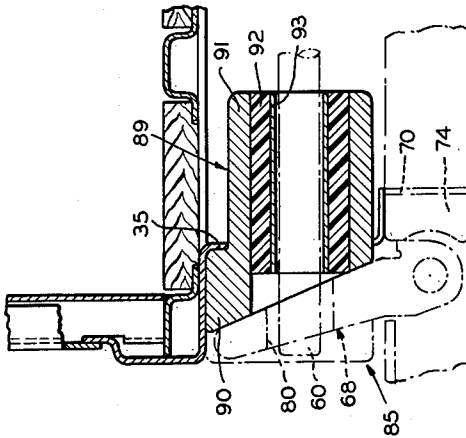


FIG. 6

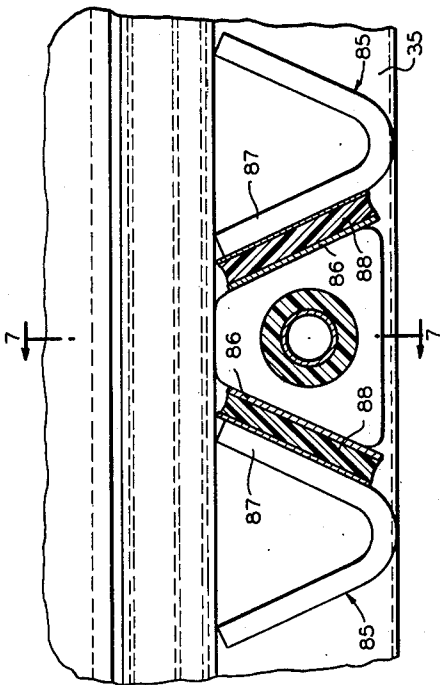
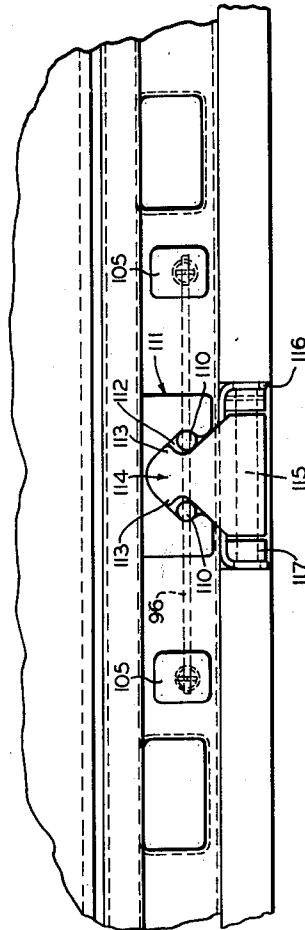


FIG. 8



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FIG. 9

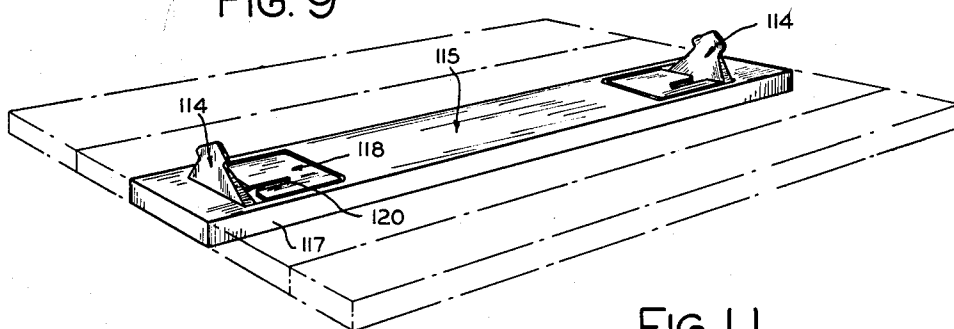


FIG. 11

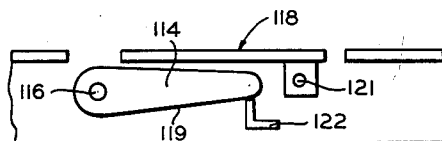


FIG. 10

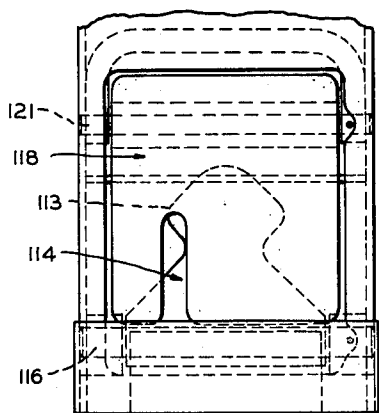


FIG. 12

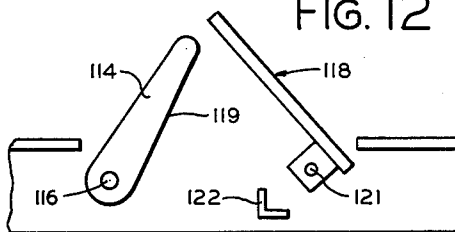
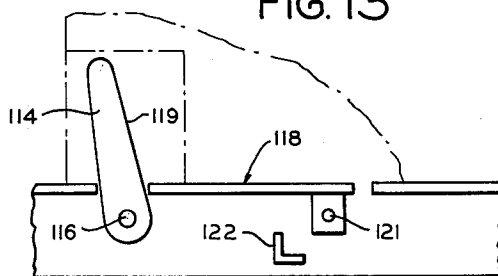


FIG. 13



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FREIGHT HANDLING MEANS

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Original application Apr. 9, 1956, Ser. No. 577,118, now Patent No. 3,014,604. Divided and this application Mar. 22, 1961, Ser. No. 97,608

2 Claims. (Cl. 105—366)

My invention relates to the handling and transporting of freight, and more particularly concerns the provision of means for effectively associating and disassociating portable freight carriers with transporting or conveyance means, such as freight cars, truck trailers and vessels.

The present application is a division of my copending application Serial No. 577,118, filed April 9, 1956, now Patent #3,014,604 which constitutes a continuation-in-part of my prior application Serial No. 531,489, filed August 30, 1955 and now abandoned.

It is an object of the invention to provide an anchor mechanism which, when associated with a conveyance acts as a guide in an operative position for positioning the carrier on the supporting surface of the conveyance and in an inoperative position may be disposed below the supporting surface so that the conveyance may be used in a conventional manner if required.

A further object of the invention is to provide an anchor mechanism adapted in its operative position to co-operate with means incorporated in a freight carrier for interlocking the freight carrier and the conveyance, said anchor mechanism being readily and easily disposable in its operative position or in an inoperative position disposed beneath or in a non-interrupting relation to the supporting surface of the conveyor.

According to the present invention, an anchor mechanism for use in securing a freight carrier to a conveyance comprises means adapted to be secured to the conveyance and a pair of retractable anchor plate members pivotally mounted on the said structure adjacent opposite ends thereof about axes substantially parallel with the load carrying surface of the conveyance and means for disposing the anchor plate members in upright positions for receiving a freight carrier therebetween.

The invention includes an anchor mechanism for use in securing a freight carrier to a conveyance comprising, an elongated structure having a flat upper surface and adapted to be secured to the top of the conveyance, a pair of flatly disposed anchor plate members pivotally mounted on the said elongated structure adjacent respectively the ends thereof, the said anchor plate members arranged to be positioned selectively in upright positions and retracted below the said flat upper surface of the elongated structure, and the said anchor plate members being disposed in confronting relation when they are in the said upright positions and the inside surfaces of the anchor plate members being tapered upwardly and outwardly whereby a freight carrier of suitable extent and having suitably tapered surfaces will be wedged between the said anchor plate members when the freight carrier is rested on and latched to the anchor mechanism.

The invention also provides, in a freight handling and transporting system of the type in which a portable freight carrier is deposited and removed from a supporting surface of a conveyance by handling equipment and in which the carrier includes a latching mechanism for securing the same to the supporting surface of the conveyance, an improved anchor mechanism, between which the freight is located, comprising a first plate member pivotal about one end and movable from a non-operative position below the plane of said supporting surface to an operative position at which it projects substantially upwardly from said supporting surface, a second plate mem-

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ber pivotally movable about its one end from a first position in which it coextensively overlays said first plate member in the latter's non-operative position to a second position in which it abuttingly engages said first plate member in substantially transverse relation thereto, and means on said first plate member for engagement with the latching mechanism of the carrier.

These and other objects and advantages of the invention will become apparent from the following detailed description.

Now, in order to acquaint those skilled in the art with the manner of making and using my improved freight carrier anchor means, I shall describe, in connection with the accompanying drawings, preferred embodiments of the anchor means and preferred manners of making and using the same.

In the drawings:

FIGURE 1 is a front view, partly in section and partly in elevation, of one embodiment of the anchor means of the invention;

FIGURE 2 is a cross sectional view taken substantially along line 2—2 of FIGURE 1 and looking in the direction of the arrows thereon;

FIGURE 3 is a perspective showing of the anchor mechanism shown partially in FIGURE 1;

FIGURE 4 is a partial top plan view of one end of the anchor mechanism of FIGURE 3, illustrating the same in a retracted condition;

FIGURE 5 is a partial cross sectional view, similar to FIGURE 2, showing the anchor mechanism of FIGURES 3 and 4 being conditioned for operation;

FIGURE 6 is a partial front elevational view similar to FIGURE 1 illustrating a second anchor mechanism;

FIGURE 7 is a cross sectional view taken substantially on line 7—7 of FIGURE 6 and looking in the direction of the arrows thereon;

FIGURE 8 is an enlarged partial front elevational view of a third anchor mechanism showing its use in conjunction with an alternative form of latching means;

FIGURE 9 is a perspective showing of a further anchor mechanism;

FIGURE 10 is a partial top plan view at one end of the anchor mechanism shown in FIGURE 9 illustrating the same in a retracted condition; and

FIGURES 11, 12 and 13 are sequential diagrammatic illustrations of the anchor mechanism of FIGURES 9 and 10 demonstrating the mode of operating the same.

Referring now to FIGURES 1 and 2 of the drawings, the anchor mechanism is shown in use with a freight carrier shown and described more fully in my said parent application Serial No. 577,118. Briefly, the freight carrier 20 has a base structure provided with parallel side rails 35. A latching pin 60 is designed to enter an opening in a cast pad 63 attached to side rail 35, and projects therefrom; operation of trip means in the base of the freight carrier causes the pin 60 to be retracted from its projecting condition. The anchor mechanism co-operates with the projecting latching pin 60, to secure the freight carrier 20 on a conveyor, and particularly on the load supporting surface thereof.

With special attention to FIGURES 1 and 2 of the drawings, the features and concepts of a preferred form of anchor retaining means for cooperation with pad 63 will be described. From these views it is well to appreciate that triangular anchor plate means 68 cooperate with the latching mechanism in retaining the freight carrier means on the transporting means and particularly the load supporting surface thereof.

As shown in these two figures, the substantially triangular shaped anchor plate 68 is pivotally supported at its lower end on a shaft member 68a carried on the side framing of the transporting means, as for example, in

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the frame work of a railroad flat car. Particularly, such shaft 68a is held by spaced bearing blocks 69, 69 mounted on a channel member 70 of the supporting bed of the railroad flat car 23. The location of the structural member 70 is inwardly of the extreme outside rail member 71 of the flat car and the pivotal axis defined by shaft 68a is beneath the upper surface of the decking 72 which constitutes a supporting surface of such railway car (see FIGURE 3). Mounted behind the anchor plate 68 so as to form a stop or abutment member for engaging a limit stop projection 73 of the anchor plate, is a block 74 which may comprise a suitable casting or the like. This relationship is illustrated in FIGURE 2 of the drawings.

The block 74, of course, limits upward swinging movement of the anchor plate 68 to dispose the general plane thereof at an angle slightly less than 90° with respect to the horizontal decking 72.

A cast block member 75 is supported on an angular channel member 76 which is welded or otherwise suitably secured to the inside face of frame member 71. Such block member presents a sloping upper face 75a which mates with the angularly disposed outside face 77 of the anchor plate 68 when the latter is nested therewith. Therefore when the anchor plate is disposed in its lowered or non-operative position surface 77 matingly engages the block 75 and presents a flush undersupport to an overlying pivotal cover plate 78. In particular, plate 78 is pivoted adjacent its outer end as on axle 79, to be pivotally movable counterclockwise, as viewed in FIGURE 2, or in opposite rotational sense when lifted upwardly about its pivotal axis from the corresponding motion of the anchor plate 68.

The operating function of the cover plate 78 of FIGURE 2 is substantially as follows:

With the anchor plate 68 in its lowered position so that surface 77 thereon engages the member 75, the cover plate 78 will be in a covering position or overlying the anchor plate. A suitable circular hole or opening (not shown) is provided in the cover plate for the insertion of a hook or an operator's finger to lift the cover plate to a substantially vertical position whereafter the anchor plate may be raised as shown in FIGURE 2, so that an opening 80 therein aligns coaxially with the projecting end of the pin means 60 of the latching mechanism whereby the pin may enter opening 80 and lock therewith. Cover plate 78 is then lowered to its FIGURE 2 position whereat the outer end thereon rests against the anchor plate and prevents the latter from swinging downwardly away from the freight carrier means 20. Thus, plate 78 serves to lock the anchor plate in its raised operative condition.

A certain modified cover plate 78' as shown in FIGURES 3, 4 and 5 is constructed with a slotted aperture 78a extending to the outward end of the plate 78' so that the entry of a hook through the cover plate to engage the eye opening 80 of the anchor plate permits lifting the anchor plate without first removing the cover plate (see FIGURE 5). Thereafter lifting the anchor plate automatically raises the cover plate until such clears the outer end of the anchor plate whereafter the cover plate falls downwardly behind the raised anchor plate to hold the latter in its raised condition. In such an arrangement it is contemplated that an operator may easily raise the anchor plates for engagement by the pin means 60, 60 of the latching mechanism in a very efficient manner.

With relation to the positioning of the freight carrier means 20 on the anchor or retaining means, it will be noted from FIGURES 1 and 2 especially that each casting 63 comprises a wedge portion 81 which is engaged by the raised anchor plates in operation with the carrier positioned on the anchor means carried by the freight transporting means, the pin members 60, pass through such wedge portions 81; the pins being guided in their

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sliding or reciprocating motion by sleeve means 82. Each casting 63 is also formed to present a substantially central triangular indentation defined by two sloping side walls 83, 83 (see FIGURE 1); into which the anchor plate is guided. The wedge portion 81 defines the rear wall of the triangular indentation and its wedge shape acts as a guide and lock to tightly wedge the attached freight carrier means against lateral motion with respect to the raised anchor plates. The walls 83, likewise serve to hold the carrier against longitudinal displacement by engaging the anchor plates. It is also to be noticed that the side walls 83 of the triangular indentation in casting 81 serve as guide means for locating and guiding the freight carrier means onto the raised anchor plates. At the same time, the wedge formation of portion 84 permits vertical withdrawal of the freight carrier means after the disengagement of the latching means from the anchor retaining means.

While the foregoing description of the anchor retaining means is related to the attachment of one end of the latching pin means 60 to one anchor retaining means, reference at this point to FIGURE 3 of the drawings will reveal the preferred construction for the anchor retaining means as embodied on the transporting means. Note that two such described anchor plate and cover plate members are located at the opposite ends of an interlying plank or beam member 84. The plank 84 is designed especially to replace a portion of the planking or decking 72 of a railroad flat car or like supporting surface on the transporting means and is further preferably constructed of metal, such as a C-channel or the like. By utilizing the plank means in combination with two anchor mechanisms a unit giving accurate lateral spacing between the anchor plate means 68 is provided and more rigid and uniform construction and installation is made possible. It is contemplated of course, that the adaptation of present supporting surfaces on railway flat cars, for instance, to my system and mechanism may be speedily brought about by removing certain of the deck planks therein and replacing the same with the combined anchor retaining units illustrated in perspective in FIGURE 3 of the drawings. It is also fully contemplated that in certain installations the requirement for the full interconnecting plank means 84 is not essential or desirable and to that end, of course, individual anchor retaining means as illustrated in FIGURE 2 of the drawings may be disposed at appropriate locations in the supporting surface for the freight transporting means. In general, however, it may be stated that the preferred embodiment for the anchor retaining means is according to FIGURE 3; such comprising substantially two plank units for each freight carrier means supported by the freight transporting means.

It will be understood that when employing the plank means 84, the block member 74 which lies behind the anchor plate 68, as shown in FIGURE 2 of the drawings, will comprise an integral portion of such plank member 84 or be rigidly affixed thereto as by welding or other suitable connective devices. In this manner then the anchor plate members 68 will be paired in the plank member 84 to assure the advantages outlined hereinabove.

In practice, the anchor retaining means are raised to the position illustrated best in FIGURE 3 of the drawings and the freight carrier means is lowered thereon so that the anchor retaining means automatically pilot the freight carrier into position and automatically lock therewith. To the latter end the sloping rear face on the anchor plates cooperates with the opposed sloping face of the wedge portion 81 to wedge-lock the freight carrier means against lateral movement and to bias the pin means 60 sufficiently inward to cause their automatic engagement with the openings 80 of the anchor plates. Thus, the retaining connection between the freight carrier means and the anchor retaining means is normally an automatic operation according to the concepts and contemplation of this invention. Likewise, the disengagement between the

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freight carrier means, or specifically the latching means and the anchor retaining means is automatic at positioning of the load material handling means appropriately to dispose such in condition for tripping the latching mechanism, as described in my parent application.

Turning now to FIGURES 6 and 7 of the drawings, I have therein illustrated certain modifications of the anchor and latching systems described herebefore. Specifically, the modified means therein illustrated is essentially the same in construction and operation as the anchor retaining and latching means described so far with the exception of the inclusion of shock-absorbing means to lessen vibration and shock created at the impact of associating the latching mechanism on the carrier means with the anchor retaining means on the transporting means. The modifications embodying such shock-absorbing means are effected largely on the freight carrier means and the mechanism associated directly with the latching means thereof.

As shown in FIGURE 6, for example, the casting 63 which serves as a guide means for the anchor plate 68 in positioning the freight carrier means, has been replaced with a pair of substantially V-shaped members 85, 85 which are suitably welded or otherwise fixedly secured to the outside of the carrier's side frame member 35. Wear plates 86, 86 are disposed in parallelism to the adjacent angularly disposed arms 87, 87 of the V-shaped members 85 outwardly of cushion pads, such as rubber pads 88, so that impact between the substantially V-shaped anchor plate guide thus formed and the outer edges of the triangular shaped anchor plate 68 of the order shown in FIGURE 3, is substantially absorbed by the rubber cushions 88.

From FIGURE 7 it will be noted that the wedge portion 81, as formerly described and shown in FIGURE 2, has been replaced with a revised cast member 89 which includes a sloping wedge portion 90 for engaging the anchor plate in its angularly disposed position and for effecting the wedge locking action therewith as described hereinabove. A cast integral cylindrical sleeve portion 91 extends rearwardly of the wedge portion 90 to encompass a cushion sleeve 92 disposed concentrically therewithin and surrounding a guide bearing 93 corresponding substantially with sleeve 82, as illustrated in FIGURE 2 of the drawings. This guide bearing acts as a means for guiding the pin means 60 as such moves in and out of the central opening 80 in the anchor plate. The presence of such cushioning means 92 materially assists in absorbing the shock occasioned by the interfitting of the latching mechanism and the anchor retaining means. Such shock-absorbing means is contemplated as a desirable feature to be embodied in the structural aspects of this invention.

While the anchor and latching means hereinbefore described are satisfactorily operable to perform their desired functions in the present invention, a desirable modified form thereof is illustrated in FIGURES 8 to 13 of the drawings, to be employed especially in instances where straddle truck type of material handling equipment is involved. Bearing in mind therefore that the latching means and anchor retaining means, as illustrated in these figures are particularly adapted for use with the straddle type materials handling equipment, or in the event that a fork lift truck is to be used and such is properly equipped for adaptation to the system therein shown, the features of this modified latching system will be more readily understood.

As seen in FIGURE 8, an anchor plate 114 having spaced downwardly facing shoulders 113 is adapted for reception in a wedge-shaped block 111 provided on the carrier, and for cooperation within said block with a pair of locking pin means 110, 110. The pins 110 extend outwardly from a movable rail 96 having pad or finger members 105, 105 at its ends which project outwardly of the carrier for engagement by an abutment member on the carriage of a fork lift truck or by a similar member asso-

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ciated with the gripping arms of a straddle truck, all as shown and described in my said parent application.

With particular reference now to FIGURES 9 and 10 of the drawings, it will be understood that two anchor plate means 114 are pivotally mounted at the opposite ends of a plank member 115 which is normally mounted transversely of a freight transporting means and corresponds closely to the plank member 84 shown in FIGURE 3. Each anchor plate 114 is formed as a substantially triangular casting having projecting ear portion 113 adjacent its upper ends and forming thereby suitable recesses beneath such ear portions for receiving the locking pins 110 of the alternative form of latch mechanism. The anchor plate means 114 are pivotally carried at their lower ends on transverse shaft members 116 mounted between side walls 117, 117 of the plank member 115. In this regard it will be noted that the anchor plate means 114 are disposed adjacent the outer ends of the plank member 115 with a pivotal cover plate 118 disposed inwardly thereof. The anchor plate 114 bears a wedge-shaped cross section and presents a sloping surface 119 to the complementary wedge-shaped cast block member 111 of the freight carrier means so that these two members may interengage. As described before in the discussion of the anchor means in FIGURES 3, 4 and 5 of the drawings for example, the wedge block 111 is suitably formed with an indentation therein so as to present a pilot opening for guiding the freight carrier means onto the projecting anchor plates of the transporting means. It should be noted that if the anchor plates 114 are raised as formerly described during the loading operation, it is essential that the projecting pin means 110 be retracted to clear the shoulder portions 113 of the anchor plates. This, of course, is easily effected by employing a straddle truck material handling device or the modified fork lift truck as described.

The cover plates 118, which are disposed inwardly of the anchor plate means 114, are suitably carried on pivot shafts 121 extending transversely of plank means 115 and such are pivotal in an opposite rotational sense from the anchor plate means 114. In this regard it is again the function of the cover plate 118 to cover the anchor plate means 114 when such is recessed and to lock the same in an upwardly extending position when required.

As seen in FIGURES 9 and 10, the cover plates 118 are suitably fitted with slotted apertures 120 adjacent one edge thereof which extend to the outer end of the plate for the insertion of a hook means. By passing a hook through such openings, the anchor plates may be engaged beneath shoulder portions 113, for raising the same from a retracted condition as illustrated in FIGURES 11-13. It will be recognized that this operation parallels the corresponding operation of anchor plate means 68 in FIGURE 4.

In FIGURES 11, 12 and 13 of the drawings, I have diagramed the operation of the reverse acting anchor retaining means, which I have termed an "inboard" type. By "inboard" I refer to the fact that the anchor plate 114 therein swings in a counterclockwise direction toward the outer edge of the carrier as such is raised to an operative position and conversely clockwise when disposed to its retracted condition. The sequence of movements for the anchor and cover plates is shown in these figures as related to the anchor systems shown in FIGURES 9 and 10. Normally, in operating an inboard anchor retaining means, as illustrated in FIGURE 11, the cover plate 118 acts to cover the anchor plate 114 when the latter is in its recessed condition against an underlying stop means 122 (see FIGURE 11). Such cover plate also serves to hold the anchor plate means in its raised condition for operatively engaging the latching mechanism of a freight carrier means (see FIGURE 13). Since the cover plates 118 are inaccessible beneath such as carrier when the latter is loaded on the transporting means, the use of an automatic tripping mechanism is required when using inboard style of anchor plates. The above requirement will be appre-

ciated when it is understood that the swinging of the anchor plate means inwardly to retracted condition negatives the possibility of manually disengaging such anchor means from the locking pin means as is possible in the outboard type of anchor retaining means illustrated in FIGURES 1 and 2. Thus, when utilizing the inboard type of anchor retaining means, an interlock between the freight carrier means and the freight transporting means is presented requiring the use of a material handling device for the disengagement of the latching means and the anchor means.

From the foregoing it is clear that I have described the principles of my invention as the same relates to certain specific mechanisms and forms of freight carrying devices, transporting means and material handling equipment. As yet I have not touched on a very important and outstanding feature of the several devices thus far described. Such is found in the included means for enabling the operator of the material handling equipment to visually perceive the locked or unlocked condition of the latching means with respect to the anchor retaining means. Note that in all forms of latching mechanisms described and in all forms of anchor means described, the latching pins, as for example pins 60 illustrated in FIGURE 2, or the multiple latching pin means 110, 110 illustrated in FIGURE 8, are designed to pass through the particular anchor plate means with which they interlock. Note further as well that such anchor plate means, as for example anchor plates 68 of FIGURE 2, and even the inboard type of anchor plates 114 of FIGURES 8-10, are disposed conveniently adjacent the outboard or bordering portions of the freight carrier means so that the invasion therethrough of the latch pin means permits visual observation of its position by the operator of the material handling equipment. Thus, when such latching mechanisms and the anchor retaining means are in their locked or interengaged condition, the protruding pin means will be readily observable to inspection. This relationship is amply demonstrated in FIGURES 1 and 2 by the projecting pin means 60. Therefore, when the operator of material handling equipment disposes his machine in a position ready to engage the load or freight carrier means and prior to imposing a lifting or removing force thereon, the retracted condition of the latching pin means is readily discerned by viewing the anchor plate means related to the transportation providing device. If the latching pin is retracted, the operator is then assured of the safety of imposing a lifting or removing load on the freight carrier means without running the risk of damaging the interlock between the freight carrier means and the supporting surface of the transporting means.

Thus, it will be appreciated that I have hereinabove set forth the features of my improved means for effectively associating and disassociating suitable portable freight carrier devices or structural means with respect to transporting means. While the foregoing description and disclosure is largely directed to particular embodiments of means for disassociating and associating the freight carrier and transporting means, it is to be understood that numerous changes, modifications and substitutions of equivalent materials and mechanisms may be made therein without departing from the scope and spirit of the inventive aspects involved. As a consequence, it is not my intention to be limited to the particular devices embodying the features of my invention as hereinabove described and

illustrated in the accompanying drawings, except as may appear in the limitations and particulars of the following appended claims.

I claim:

1. A mechanism for securing a freight carrier to a conveyance, comprising a horizontally disposed member adapted to be secured to the conveyance, the said horizontally disposed member having an opening therethrough, an anchor plate pivotally mounted on the said member and arranged to be positioned selectively in an upright position in which the anchor plate projects through the said opening adjacent one edge thereof and in a horizontally disposed position below the upper surface of the said horizontal member, means on the said anchor plate member for moving it from the said horizontally disposed position to the said upright position, a cover plate pivotally mounted on the said member and arranged in the said opening to serve as a stop for the said anchor plate member in its upright position and as a cover for the anchor plate member in its horizontally disposed position, and the said cover plate member having an opening therein whereby a hook member may be inserted to engage the said means and move the said anchor plate member from its horizontally disposed to its upright position.

2. An anchor mechanism for a conveyance for securing a freight carrier thereto, comprising a horizontally disposed member of inverted U-shape in cross section with the upper surface of the bight portion forming a flat horizontally disposed surface, the said bight portion having an opening therethrough, an anchor plate pivotally mounted on the said member and arranged to be positioned selectively in either of two positions, one of the said positions being an upright position in which the anchor plate member projects above the said upper surface through the opening in the said bight portion and the other position being a retracted position in which the said anchor plate member is disposed entirely within the confines of the said horizontally disposed member below the opening therethrough, a cover plate member pivotally mounted on the said horizontally disposed member and arranged to act as a stop for the said anchor plate member when the latter is disposed in its said upright position and to cover the anchor plate member when it is disposed in its lower retracted position, means on the said anchor plate member by which it may be engaged by hook means for moving it from its retracted position to its upright position, the said cover member being provided with a slot through which hook means may be inserted to move the anchor plate member from its retracted to its upright position, and the said anchor plate member and the said cover plate member being arranged in a manner such that when the anchor plate member is moved from its retracted to its upright position the cover plate member automatically is moved aside and then falls back to a locking position in which it acts as a stop for the anchor plate member.

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