May 28, 1963 J. G. FISHER 3,091,503

FLOATING PLATFORM LOCK-DOWN MECHANISMS FOR SPOOLER TROUGHS AND DOFF TRUCKS

Filed March 30, 1961 2 Sheets-Sheet 1

Fig. 1.

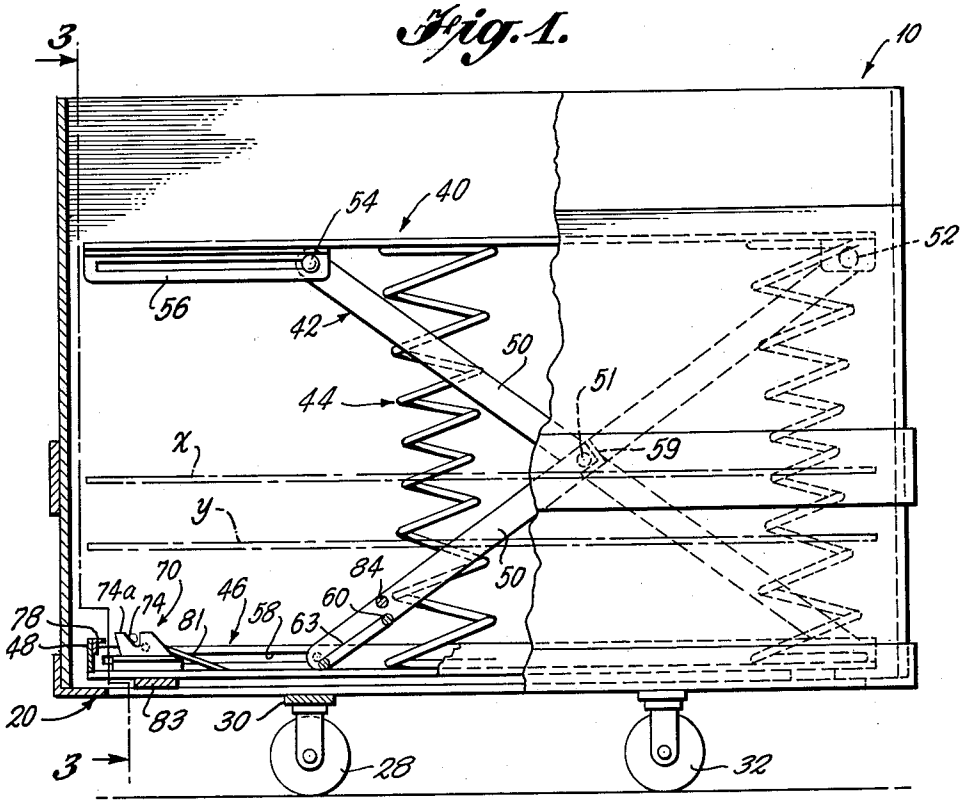
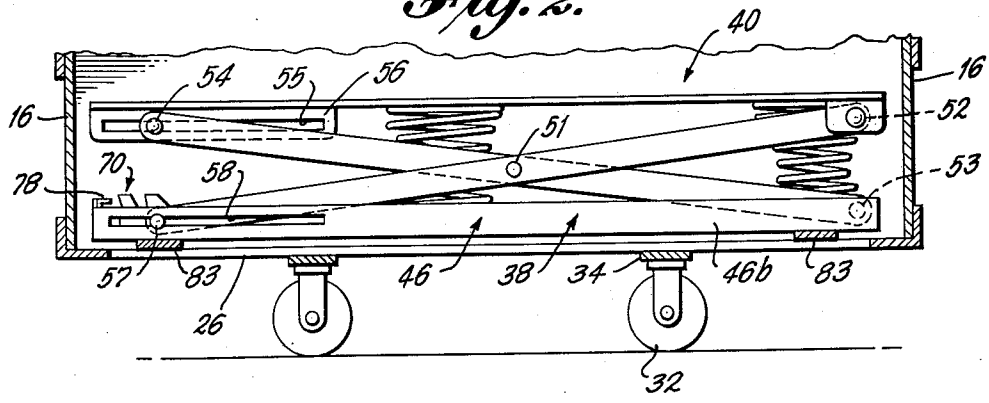


Fig. 2.



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Fig. 4.

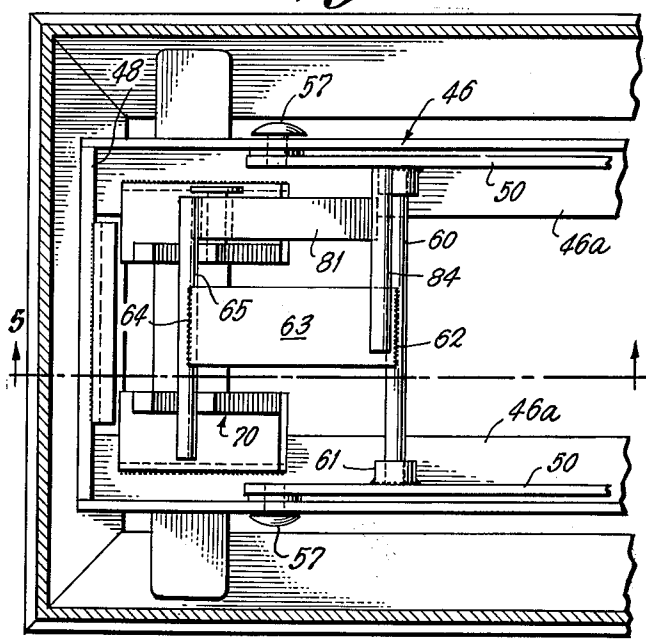


Fig. 3.

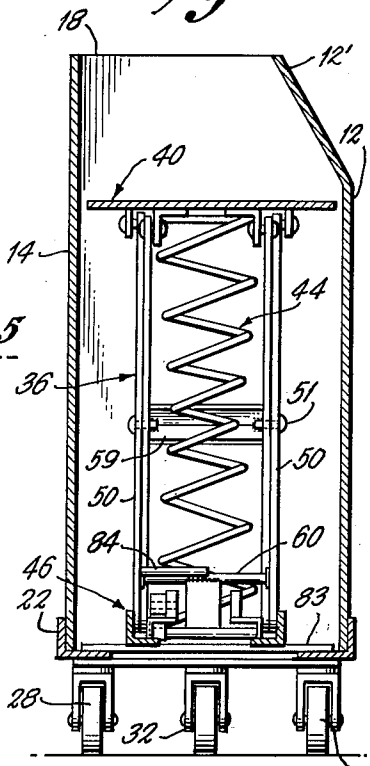


Fig. 5.

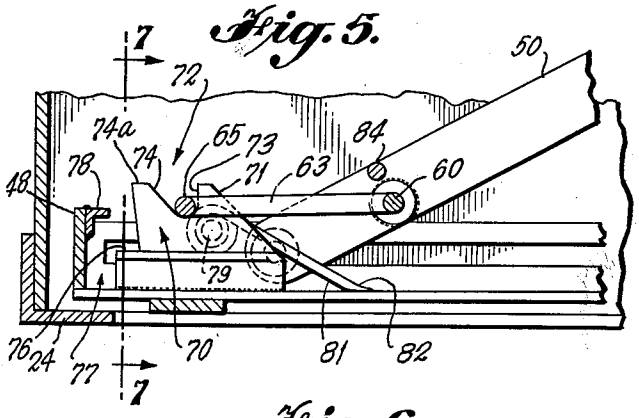


Fig. 7.

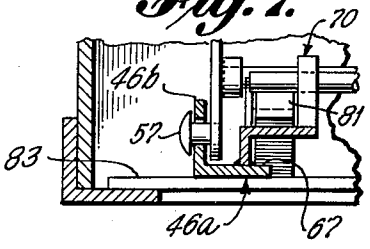


Fig. 6.

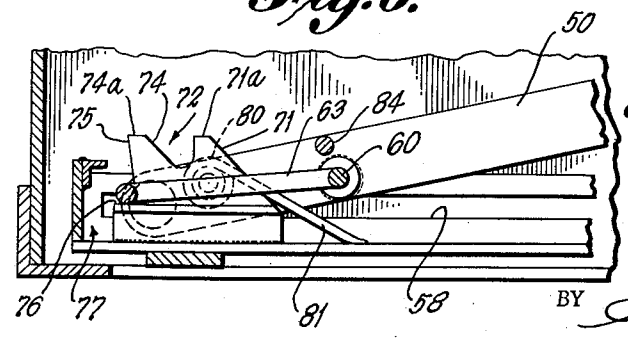
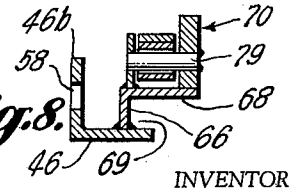


Fig. 8.



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United States Patent Office 3,091,503 Patented May 28, 1963

3,091,503

FLOATING PLATFORM LOCK-DOWN MECHANISMS FOR SPOOLER TROUGHS AND DOFF TRUCKS

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Filed Mar. 30, 1961, Ser. No. 99,384
11 Claims. (Cl. 312—71)

This invention relates generally to improvements in bobbin or spooler troughs and doff trucks of a construction in which a floating platform is employed and the invention is directed particularly to an improved lock-down means for such platform.

In the operation of textile equipment use is made of spooler troughs, doff trucks and like structures having followers or floating bottoms onto which the bobbins or spools and the like are placed and such floating bottoms or follower platforms or bottoms are spring supported so that as the load in the truck receptacle is lightened the platform will rise and maintain the articles in position conveniently close to the open top of the receptacle to enable an operator to remove the articles without difficulty and without causing unnecessary tiredness. Such follower bottoms or platforms, or floating platforms, are actuated by relatively heavy springs since it is necessary that the springs be sufficiently strong to lift the load when the truck is fully loaded. Consequently when the truck is being filled it is necessary for someone to hold the platform down while the filling operation is being carried out.

In my prior application Serial No. 659,402, filed May 15, 1957, now Patent No. 2,980,481, there is shown a latching or hold-down means for the follower platform together with a means for manually releasing the hold-down from the exterior of the receptacle.

It is a particular object of the present invention to provide a hold-down means wherein a novel construction is provided which enables an operator to release the platform so that it may be elevated when desired, without having to manipulate any parts located exteriorly of the receptacle.

It is another object of the present invention to provide in a hold-down mechanism of the character above stated, a novel arrangement whereby release of the platform or inactivation of the hold-down means can be effected by applying a certain amount of downward pressure to the platform sufficient to force the platform downwardly beyond the latched or secured position.

A further and more specific object of the invention is to provide in a structure of the character described and in association with a spring actuated floating platform, a hold-down mechanism designed to secure the platform in more than one lowered elevation and having associated therewith a novel release means whereby a pivotally mounted latch is caused to leave or become disengaged from the keeper upon the depression of the platform beyond its lowermost secured position and to guide the latch past the keeper means upon subsequent release of the platform when the elevating springs take over to return the platform to its fully raised position.

The invention broadly contemplates the provision of a floating platform structure adapted to be installed as a removable unit in a spooler box or doff box and comprising a bottom frame resting upon bottom forming means

in the box or receptacle, a platform above the bottom frame and elevating springs between the bottom frame and the platform and constantly urging the platform upwardly. Stabilizing means interposed between the bottom frame and the platform constitutes a pair of toggle arm units, one arm of each unit being fixedly but pivotally attached to the underside of the platform at one end and the other arm of such unit being fixedly but pivotally attached to the bottom frame, the other ends of the two arms being slidably coupled respectively with the platform and the bottom frame.

A latch element pivotally operatively coupled with the platform through the medium of two oppositely positioned arms of the toggle units is designed to slide forwardly and backwardly with the up and down movements of the platform and with respect to a keeper. Such keeper is designed to receive and hold the latch element in two locations representing two different elevations or levels for the platform.

Means is provided whereby the latch will be detached from the keeper upon depression of the platform beyond its lowermost latched or secured position and then guided back past the keeper when the downwardly applied pressure is removed from the platform after release of the latch from the keeper, permitting the platform supporting springs to then reelevate the platform.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming a part of this specification with the understanding, however, that the invention is not confined to a strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as defined by the appended claims.

In the drawings:

FIG. 1 is a view in front elevation of a spooler truck in which a portion of the front wall is broken away to show the improved hold-down mechanism of the present invention and also illustrating the floating platform in elevated position.

FIG. 2 is a longitudinal sectional view through the lower portion of the spooler box or receptacle and illustrating the platform in its lowest lock-down position.

FIG. 3 is a vertical transverse section taken substantially on the line 3—3 of FIG. 1.

FIG. 4 is a sectional view on an enlarged scale and taken in a horizontal plane through the hold-down end of the truck box showing the hold-down mechanism in top plan and operative for securing the platform in an incompletely lowered position.

FIG. 5 is a sectional view taken in a vertical plane substantially on the line 5—5 of FIG. 4.

FIG. 6 is a sectional view taken in a vertical plane similar to FIG. 5 but showing the hold-down mechanism operative for maintaining the platform in the lowest secured position thereof.

FIG. 7 is a detail section taken substantially on the line 7—7 of FIG. 5.

FIG. 8 is a sectional detail illustrating the mounting for the latch elevator finger.

Referring now more particularly to the drawings, the numeral 10 generally designates a truck receptacle of a type used in the handling of spindles or packages and

designed to be placed by the side of a spooler whereby an operator can doff into the same.

While one type of truck is here shown, it is to be understood that the invention hereinafter particularly described is not limited to use with the doff truck here shown but may be used in any receptacle included in the category of textile apparatus.

The wheel supported receptacle, generally designated **10**, comprises the front and back walls **12** and **14** respectively and end walls **16**. The front wall **12** has an upper inwardly sloping portion **12'** which permits the positioning of the truck against the front or breast of a spooler machine.

As shown the receptacle has a top opening **18** and in the bottom part thereof the numeral **20** generally designates a bottom forming means for the truck, which bottom forming means is here illustrated as being comprised of an open frame having the longitudinal side angle bars **22** and the transverse end angle bars **24**. As shown the angle bars of the floor forming means are disposed so as to have one web or angle portion extending horizontally inwardly to provide a support for the hereinafter described floating support means. Thus it will be seen that the bottom forming means provides a central opening **26** in the bottom of the receptacle which prevents the accumulation of lint in the bottom of the receptacle. However, it is to be understood that while the bottom forming means has been shown and described as an open frame the receptacle may be provided with a continuous floor or bottom upon which the floating support means may rest.

The truck structure also includes suitable supporting casters or wheels as illustrated and it is preferred that there be two wheels adjacent to one end of the truck and spaced apart transversely thereof, for cooperation with a single wheel rearwardly of the pair of wheels and along the longitudinal center of the truck.

The two laterally spaced wheels are designated **28** and these may be secured to a suitable carrying bar **30** disposed across the floor forming means **20** and secured to the undersides of the horizontal flange portions of the side angle bars **22**.

The single centrally positioned wheel is designated **32** and this also may be secured to a carrying bar **34** disposed across the frame **20** and secured to the side angle bars thereof.

While the central or trailing caster wheel **32** has not been shown as a swivel caster, it is to be understood that it may be made in this form if desired.

The floating support means is generally designated **36** and is preferably so constructed, as here illustrated, that it may be readily removed from the receptacle if necessary.

The floating support means **36** comprises a base frame which is generally designated **38**, a follower platform **40** and two toggle units between the base frame and the platform, each toggle unit being generally designated **42**.

The base frame **38** and the platform **40** are also connected together by suitable expansion springs, two of which are here illustrated and each being generally designated **44**. The base frame **38** is formed in part of angle iron material and comprises the longitudinal angle iron side bars **46** and the transverse flat end bars **48** and the angle bars **46** are positioned to have one flange **46***a* disposed horizontally and extending inwardly and the other flange **46***b* extending vertically.

The lower ends of the springs **44** are suitably supported upon the horizontal inwardly extending flanges **46***a* of the angle bars **46** either by resting directly upon the flanges or they may be supported upon a suitable plate, not illustrated, which might be disposed across the base frame and rest at its ends upon the horizontal flanges of the bars **46**.

Each toggle unit comprises two crossed bars **50** which are pivotally coupled together intermediate their ends as indicated at **51**. One of the two bars is pivotally attached

as at **52** to the underside of the platform **40** at the rear end thereof and the other bar **50** of the same unit is pivotally attached as at **53** to the rear end of the base frame against the inner side of the horizontal bar or rail **46**. The other end of the bar **50** of each unit which is attached to the base frame extends upwardly and forwardly and carries a guide pin **54** which is positioned for sliding movement in a long guide slot **55** formed in a suitable plate for flange **56** secured to and depending from the underside of the platform **40** adjacent to the forward end of the latter. The forward end of the bar **50** of each toggle unit, which is pivotally attached at **52** to the platform, extends downwardly and forwardly and carries a guide pin **57** which has sliding engagement in a guide slot **58** formed through the vertical flange **46***b* of the adjacent side angle bar **46** of the base frame as is most clearly illustrated in FIGS. 1 and 2.

The two toggle units function to maintain the platform horizontally in its upward and downward movements and in order to strengthen and rigidify the toggle units a transverse brace bar **59** is secured across the space between and at its ends to the innermost bars **50** of the two toggle units as is most clearly seen in FIG. 3.

The novel hold-down or latch-down mechanism of the present invention is designed to function automatically to secure the platform at at least two lowered elevations and to release the platform so that it may be returned to its fully raised position by the springs **44** when the platform is pressed downwardly beyond its lowest secured or latched elevation.

The hold-down mechanism comprises a rock shaft **60** which extends transversely of and between the lower forward ends of the innermost toggle bars **50** of the two toggle units as shown in FIG. 4 and the ends of this rock shaft are rotatably supported in bearing sockets **61** carried by the two inner bars **50** of the toggle units. Secured at one end to the rock shaft **60**, as at **62**, is an arm **63** which at its opposite and forward end is secured as at **64**, by welding or any other suitable manner, to the medial portion of a transversely disposed latch element **65**, here shown as being in the form of a long pin which is of sufficient length to span the space between the side bars **46** of the base frame and rest at its ends during certain periods in the operation of the mechanism upon the horizontal inwardly projecting flanges **46***a* of the side bars **46**, as shown in FIG. 3.

Secured to the horizontal inwardly extending flange portion **46***a* of each angle bar **46**, adjacent to the forward end of the bar is an upstanding flange **66** which is spaced inwardly slightly from the free inner edge of the flange as clearly shown in FIGS. 7 and 8, so as to provide a portion of the flange to function as a guide track for the movement therealong of an end of the latch element pin **65**, as hereinafter described. This flange **66** is also spaced inwardly slightly from the vertical flange **46***b* of the angle bar **46** to provide space for the movement of the lower end of the adjacent toggle bar **50**.

Each of the flanges **66** has secured along its top edge or is formed integral with an inwardly projecting horizontal plate **68** which projects inwardly beyond the inner edge of the horizontal flange of the angle bar **46** as is also clearly shown in FIGS. 7 and 8. This plate **68**, the flange **66** and the track portion **67** of the angle bar flange forming a guide channel **69** for the adjacent end of the latch element pin **65** in the release action of the mechanism.

Each of the two oppositely positioned plates **68** supports on its top surface and adjacent to its inner edge, an upstanding keeper plate **70**. Each of these keeper plates has a forwardly and downwardly inclined edge **71** and an upwardly opening notch **72** immediately therebehind, the notch **72** having a substantially vertical forward edge **73** and an upwardly and rearwardly inclined edge **74**. Each of the plates has a rear downwardly and forwardly inclined edge **75** which terminates at the bottom

end slightly forwardly of the rearmost end of the plate **68**, thus forming a rest surface **76** which corresponds in function to the notch **72**, as will become apparent in the hereinafter set forth description of the operation of the mechanism.

The rearward ends of the flanges and plates **66** and **68** are set forwardly of or spaced forwardly from the inner side of the transverse bar **48** of the base frame, thus forming a recess **77**, the top of which lies below the top edge of the bar **48** and forms a part of the guide channel for receiving the ends of the pin **65**.

The transverse bar **48** has secured thereto an inwardly projecting deflector flange **78** which is in a plane above the top of the rear end of the plates **68** and overlies the upper part of the recess **77**.

The function of this deflector plate **78** will become apparent in the hereinafter set forth description of the operation of the mechanism.

At least one of the latch plates **70** has secured thereto and projecting laterally from the outer side thereof a pivot pin **79**. This pin is disposed below and slightly forwardly of the notch **72** and passes through the sleeve portion **80** of the latch deflector finger or elevator **81** which extends forwardly and downwardly and is beveled on its underside to provide a sharp edge **82** which rests upon the surface flange **46***a* of the adjacent angle bar **46**.

The floating support means rests upon the bottom forming means of the receptacle and this is effected by the provision of forwardly and rearwardly located transverse flat bars **83** which underlie the flanges **46***a* of the angle bars **46** and rest at their ends upon the horizontal flanges of the angle bars **26**.

In the operation of the hold-down or latching mechanism of the present invention it will be seen upon reference to FIG. 1 that when the platform is in the fully raised position the latch element will be disposed at a substantial distance forwardly of the keeper elements and of the lower end of the latch deflector or elevator **81**, the latch element resting at its ends upon the horizontal flanges **46***a* of the angle bars **46**.

The latching mechanism is designed so that the platform may have two secured positions or may be secured at two lowered elevations which are indicated in broken lines in FIG. 1 at *x* and *y*. In the lowered position *x* the latch element pin **65** will rest at its ends in the notches **72** of the transversely spaced keeper elements **70**, which notches, of course, are in alignment transversely of the structure and when in the lowest position *y* the transversely extending latch pin element **65** will rest on the supporting surface **76**, as shown in FIG. 6, so as to hold the platform **40** against upward movement.

In the operation of latching down the platform in either of these two designated positions or elevations, when the downward pressure is applied to the platform the latch pin element **65** will be slid rearwardly along the horizontal flanges **46***a* and upon reaching the deflector or elevator **81** the element **65** will have one end forced upwardly along the rearwardly and upwardly inclined surface of the deflector.

It will be seen upon referring to FIGS. 5 and 6 that the plane of the top surface of the deflector intersects the plane of the inclined surface **71** of the keeper elements and accordingly the ends of the latch pin element will be caused to ride onto these surfaces **71** and continue to move upwardly until it rides over the top of the first point **71***a* of the keeper to drop into the notch **72**. This will effect holding of the platform at the elevation *x*.

Further downward pressure applied to the platform will cause the ends of the keeper element pin **65** to ride up on the surfaces **74** of the keepers and over the point **74***a* to drop down behind the rearwardly inclined surface **75** onto the supporting surface **76**. While the supporting surface **76** and the edge **75** are not in the form of a cutout or a notch similar to the notch **72**, it will be appreciated that they in effect function as a notch as the same function is served, the edge **75** holding the pin against reverse movement and the surface **76** acting in the same capacity as the notch **72** to support the pin.

After the receptacle has been loaded and it is desired to release the platform so that the same can be raised by the springs **44**, if the maximum load on the platform is not sufficient to effect its automatic release, an operator can bring about this action by exerting additional downward pressure to the platform and in doing this the ends of the latch pin element **65** will be caused to ride rearwardly off of the plates **68** into the recesses **77** and then upon releasing the platform to permit the springs to take over the platform may rise and this is permitted by the ends of the latch pin element being caused to move forwardly in the guide channels **69**.

The latch deflector or elevator member, being pivotally supported as shown will be itself raised or elevated by the end of the latch element pin pressing against the underside thereof and causing it to rise so that the pin can be freed to move back along the flanges **46***a*.

One of the arms **50** of a toggle unit is shown equipped with a stop member in the form of a long pin extending inwardly from the arm at an elevation above and slightly in advance of the shaft **60**. This pin or stop member is designated **84** and, as shown in FIG. 4, extends across, and above, the deflector **81**. This stop member prevents the deflector **81** from being thrown up and over the shaft **60** in the event that the platform is pushed down with sufficient violence to cause this action from the rapid riding of the latch element pin **65** up along the surfaces **71** of the keepers.

As shown in FIG. 3, the width of the platform **40** is greater than the width of the receptacle opening **18**. Thus a side portion of the platform extends under the inner side of the sloping front wall portion **12'**. With this arrangement when the platform is loaded and raised the spools or bobbins will be more or less compacted or compressed in the narrow portion of the opening **18** and consequently the load on the platform cannot be raised to the elevation where any of the spools or bobbins would spill out from the receptacle.

From the foregoing it will be seen that there is provided by the present invention a new and novel lock-down mechanism for a floating platform structure which can be operated effectively and automatically and without requiring the employment of any extraneous or exteriorly located means for effecting the latching of the mechanism or the unlatching thereof. In other words, the entire lock-down mechanism is contained in the lower part of the receptacle or truck box and forms a part of the floating support means for floating support unit so that it is fully removable as an element of such unit and to effect removal of the floating support means with the lock-down mechanism there is no necessity for removing or disassembling any parts of the structure or detachment of any parts of the structure from the box.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined in the appended claims, and all changes that fall within the metes and bounds of the claims, or that form their functional as well as conjointly cooperative equivalents, are therefore intended to be embraced by those claims.

I claim:

1. A textile handling apparatus including a receptacle having an open top, side and end walls and bottom forming means, a floating support means in the receptacle embodying a follower platform and supporting spring means for and constantly urging the platform upwardly, the platform being movable from a fully elevated position to at least two lowered positions and being securable in each of said lowered positions, a lock-down mechanism for the support means comprising cooperating latch and keeper

elements, one element being operatively coupled with the platform and the other element being supported by said bottom forming means, said elements being adapted to move relatively to one another into a coupled platform securing relationship upon movement of the platform to a first one of said two lowered positions, means for guiding one of said elements into said coupled relationship with the other element while the platform is moving downwardly into said first one of said lowered positions, and means for effecting uncoupling of the latch and keeper elements while the platform is moving downwardly beyond said first one of said lowered positions to the second one of said lowered positions.

2. A textile handling apparatus including a receptacle having an open top, side and end walls and bottom forming means, a floating support means in the receptacle embodying a follower platform and supporting spring means for and constantly urging the platform upwardly, a lock-down mechanism comprising cooperating latch and keeper elements, one element being operatively coupled with the platform and the other element being supported by said bottom forming means, a movable latch element deflector means adjacent to said keeper element for receiving and elevating said latch element into latching engagement with the keeper element upon movement of the platform to a predetermined incompletely lowered position, means for shifting said latch element out of engagement with the keeper element upon further downward movement of the platform beyond said predetermined position, and means for guiding said latch element uninterruptedly along a reverse path of movement past the keeper element and under said deflector means to permit upward movement of the platform.

3. A textile handling apparatus including a receptacle having an open top, side and end walls and bottom forming means, a floating support means in the receptacle embodying a follower platform and supporting spring means for and constantly urging the platform upwardly, the platform being movable downward from a fully elevated position to successive first, second and third lowered elevations, a lock-down mechanism for the support means comprising cooperating latch and keeper elements, one of which elements is operatively coupled to the platform and the other element being supported by the bottom forming means, said keeper element comprising a plate having an upwardly directed edge provided with a latch part receiving notch and an inclined latch elevating edge at one end leading toward said notch and a reversely inclined edge at the opposite end, said latch element being pivotally mounted for up and down swinging movement, said elements being adapted to be moved relatively to one another upon up and down movement of the platform, said latch element including a part positioned to ride up on and over the top of said elevating edge and into said notch upon downward movement of the platform to its first low elevation position, said notch being formed to effect movement of said latch element part to a position of engagement with said reversely inclined edge upon movement of the platform to its second low elevation position, and means for effecting release of said latch element part upon depression of said platform to its third low elevation position.

4. The invention according to claim 3, with a latch deflector pivotally supported at one end adjacent to one side of said keeper plate for vertical swinging movement and extending downwardly across said elevating edge of the keeper plate, said latch deflector receiving the said latch element part upon movement of the latter toward the keeper to raise and guide said part onto said keeper edge, and said keeper element part moving reversely beneath said latch deflector following its release from the keeper element.

5. The invention according to claim 3, wherein the element coupled to the platform is the latch element, means supporting the said part of the latch element for sliding movement toward the said elevating edge of the keeper plate upon downward movement of the platform whereby said latch element part is caused to ride into said notch at the first said low elevation position of the platform, said keeper element being disposed at an elevation above the path of sliding movement of the latch element part, and there being a guide channel forming means for receiving the latch element part upon its release from the keeper element and formed to guide the latch element part in a reverse direction past the keeper element to permit the follower platform to rise.

6. A textile handling apparatus including a receptacle having an open top, a floating support means in the receptacle embodying a follower platform, supporting spring means therefor and constantly urging the platform upwardly, laterally spaced parallel guide bars supported in the lower part of the receptacle and having forward and rear ends and stabilizing toggle units having arms connected between the platform and said guide bars with certain of the arms having ends coupled with the forward ends of the guide bars for sliding movement longitudinally thereof in the up and down movements of the platform, the platform being movable downward from a fully elevated position to at least two lowered elevations, a lock-down mechanism for the platform adjacent to the said forward ends of the guide bars and comprising a keeper means embodying a keeper plate extending longitudinally of the bars and having a top edge notch, means supporting the keeper plate on and at an elevation above the guide bars, a latch element pivotally joined to that end of a toggle arm which is coupled to a guide bar and having a part slidable on the adjacent guide bar for movement rearwardly toward the keeper plate by and upon downward movement of the platform, means for swinging the pivoted latch element upward and effecting elevation of said part thereof into the keeper notch upon said rearward movement thereof by and upon movement of the platform to a predetermined one of its lowered elevations, and means operative upon lowering the platform from said predetermined one of its elevations for disconnecting the latch element part from the keeper plate notch and lowering such part to an elevation below said keeper plate supporting means onto said bar for reverse sliding movement thereon past the keeper plate.

7. The invention according to claim 6, wherein said means for swinging the pivoted latch element upwardly comprises an elongate deflector element pivotally mounted at one end for swinging movement about a horizontal axis and extending from said end downwardly and forwardly with respect to and beyond the front end of the keeper plate and resting at its other end upon the said bar along which the latch element part is adapted to slide.

8. The invention according to claim 6, wherein said keeper plate supporting means comprises a horizontal plate extending longitudinally of and in vertically spaced relation to the adjacent guide bar, said keeper plate having a rear end edge position for engagement by said latch element part, said horizontal plate extending rearwardly beyond said rear end edge of the keeper plate and providing a support for said latch element part, said support being adapted to receive the latch element part upon rearward and gravitational downward movement of the part from said notch whereby said part is maintained in holding engagement with said rear end edge of the keeper plate, the latch element part being moved from said horizontal plate rearwardly and downwardly in the operation of said disconnecting means.

9. The invention according to claim 8, with means disposed rearwardly of said keeper plate for guiding the latch element part to position on said receiving support.

10. The invention according to claim 8, wherein said rear end edge of the keeper plate inclines upwardly and rearwardly from the supporting plate.

11. The invention according to claim 8, with a deflecting means for the latch element part disposed in spaced relation with the said rear end edge of the keeper plate at an elevation between the topmost part of the keeper plate and said horizontal plate and having a forward edge disposed in a vertical plane perpendicular to said bar and in relatively close adjacency to a vertical plane common to the rearmost portion of said horizontal plate and parallel to said first plane.

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