Dec. 24, 1968 J. G. FISHER 3,418,031

FLOATING PLATFORM LOCK-DOWN MECHANISM FOR SPOOLER TROUGHS AND DOFF TRUCKS AND THE LIKE

Filed Aug. 30, 1967 2 Sheets-Sheet 1

Fig. 1.

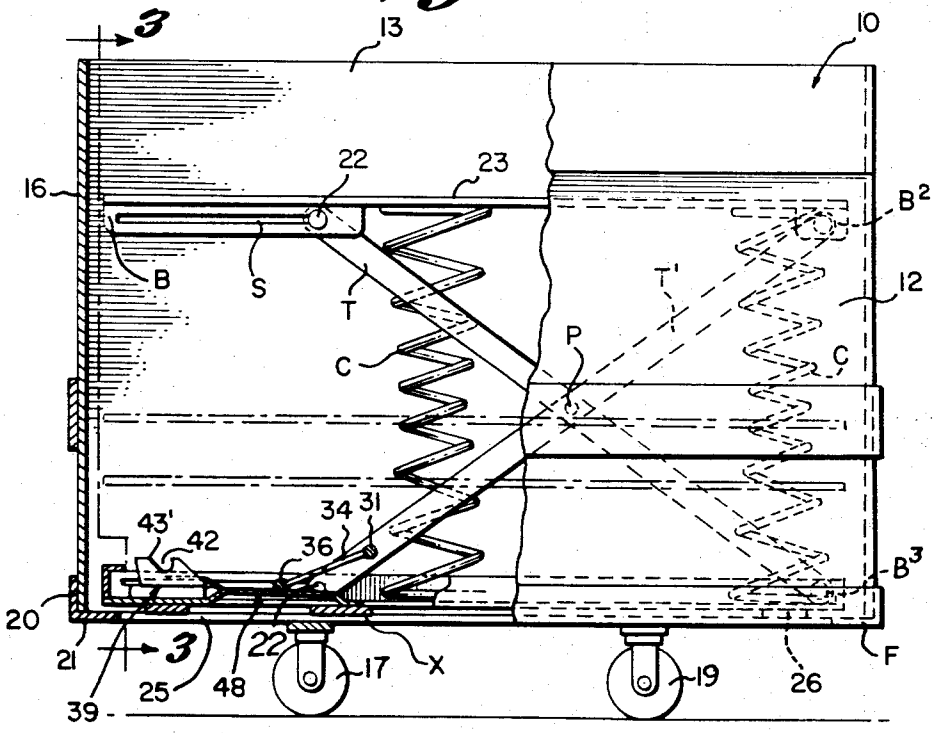
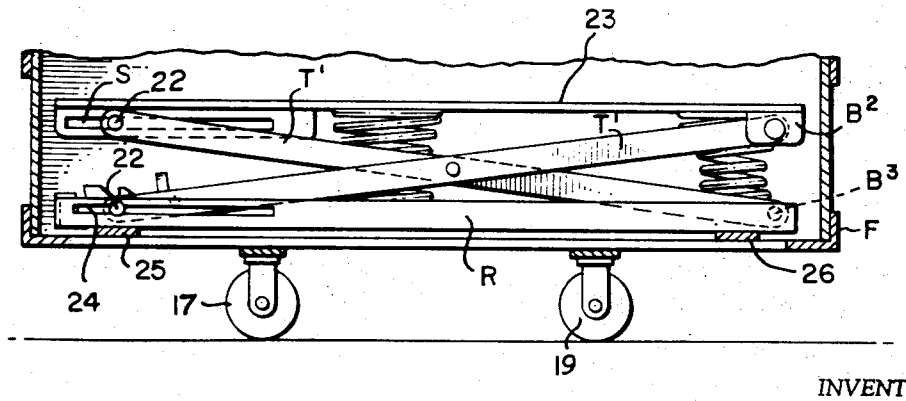


Fig. 2.



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Filed Aug. 30, 1967 2 Sheets-Sheet 2

Fig. 4.

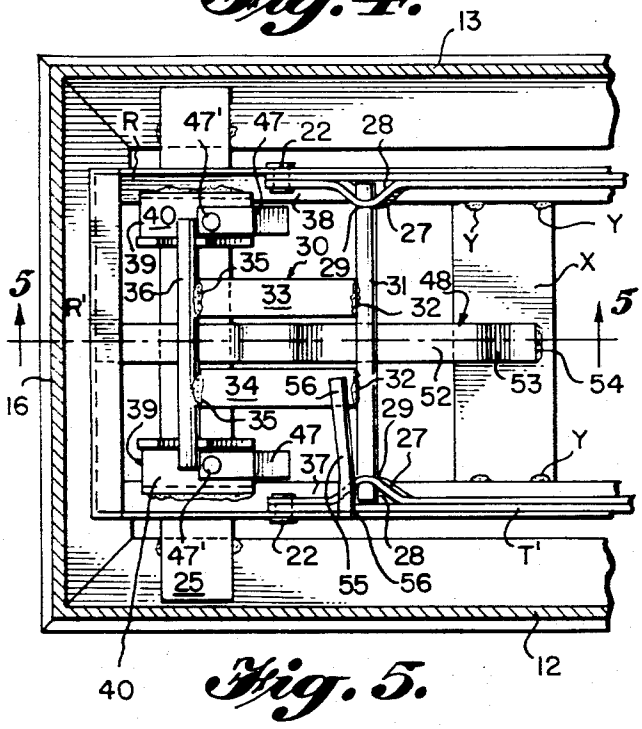


Fig. 5.

Fig. 3.

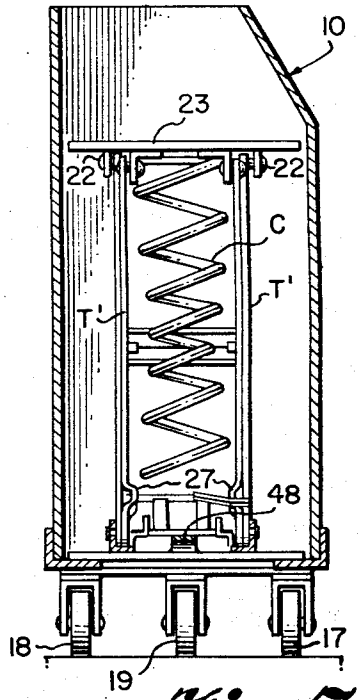
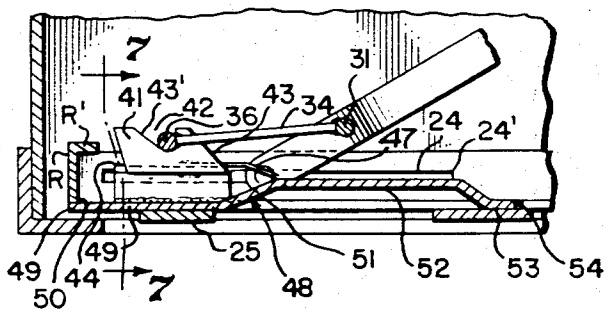


Fig. 7.



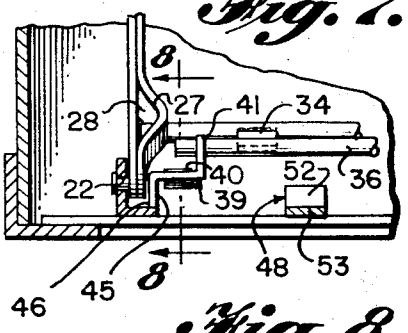


Fig. 6.

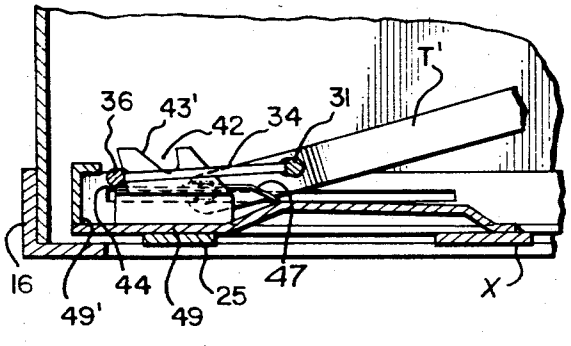
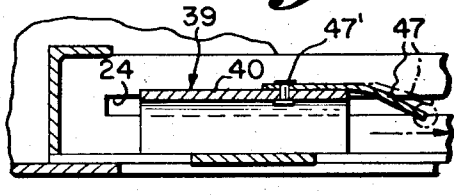


Fig. 8.



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FLOATING PLATFORM LOCK-DOWN MECHANISM FOR SPOOLER TROUGHS AND DOFF TRUCKS AND THE LIKE

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Filed Aug. 30, 1967, Ser. No. 664,458
4 Claims. (Cl. 312—319)

ABSTRACT OF THE DISCLOSURE

This invention for the lock-down mechanism is comprised of unique reinforced toggle arms that support a platform in a receptacle and said arms provide for a unique attachment for pivotally attaching a shaft thereto and carrying and uniquely supporting outwardly thereof latch rod means and a pair of spaced oppositely disposed resilient flat spring means extending forwardly of and carried by similar latch keeper means and a centrally disposed latch bar elevating means extending substantially midway between the said keeper means and the sides of a frame in which certain ends of the toggle arms are slidably maintained, and the said elevating means being so formed and of varying heights as to properly guide the latch bar onto the said springs and up over inclined edges of the keeper means and into an aligned notch in each of the keeper means and for releasing the latch rod from the keeper means to a second position of lowering of said platform supported by the toggle arms and the return of the latch rod from beneath the keeper means and snapping past the respective springs of the keeper means and being raised by the elevating means for a repetition of this movement.

An object of the invention is to provide a new lock-down mechanism for a floating spring loaded platform of a doff truck or the like embodying novel means for the cycling of the components thereof and reducing the cost of production, and such mechanism as will be simpler to clean and eliminating some of the moving parts of the prior art lock-down mechanisms and, additionally, be more positive in its cycling operation as caused by the lowering of the platform.

Another object of the invention, therefore, is to provide a new lock-down mechanism embodying unique action and carrying and mounting of a latch rod and downwardly extending inclined spring means for elevating the latch rod and positioning it in the notch of a keeper means which is the first lowered position of a platform vertically movably supported in a receptacle, and releasing the rod from this first lowered position to a second lowered position, and returning the rod from beneath said keeper means and past said spring means, and providing other means for elevating the latch rod so that it will be in a position above the ends of the spring means for a repetition of this movement.

Another object of the invention is to provide a novel lock-down mechanism having reinforced toggle arms and the toggle arms having oppositely disposed outwardly extending portions providing a space and each having an opening therein, and which said openings are aligned, and a shaft for supporting a latch rod having its respective ends mounted in said openings and extending into said space.

Still another object of the invention is to provide unique downwardly extending inclined spring means carried by latch rod keeper means for allowing elevation of the latch rod into first and second lowered positions of a vertically movably supported platform in combination with latch rod elevating means that will maintain said latch rod above the ends of the spring means so as to enable the latch rod, when moved, to ride up the same into the said locking positions and the return of the latch rod being so elevated that the same movements may be repeated.

In the drawings:

FIG. 1 is a side elevational view of a doff truck, partly in section, and disclosing the improved lock-down mechanism in section, and with the following platform in fully elevated position;

FIG. 2 is a sectional view showing the follower platform in its fully depressed or downward position adjacent the bottom of the truck;

FIG. 3 is a sectional view taken along the lines 3—3 looking in the direction of the arrows in FIG. 1;

FIG. 4 is a partial longitudinal sectional view disclosing the improved lock-down mechanism;

FIG. 5 is a sectional view taken on the lines 5—5 of FIG. 4 looking in the direction of the arrows and showing the lock-down mechanism in the first downward stage;

FIG. 6 is a view similar to FIG. 5, showing the lock-down mechanism in the second lowest downward stage;

FIG. 7 is a sectional view along the lines 7—7 of FIG. 5 looking in the direction of the arrows; and

FIG. 8 is a view along the lines 8—8 of FIG. 7 looking in the direction of the arrows.

The present invention is an improvement of my Patent No. 3,091,503, May 28, 1963.

The features in common with regard to my aforesaid patent are the wheel supported receptacle **10** which comprises front and back walls **12** and **13** respectively, and end walls **16**. A pair of aligned and oppositely disposed casters **17** and **18** are secured to the bottom frame of the truck and are preferably fixed. The central caster **19** is preferably mounted as to swivel. There is a main frame F which is of angle iron and which has opposite sides and ends for reception therein of the lower marginal portions **20** resting on the bottom flange **21**. The receptacle is open topped and has mounted therein oppositely disposed toggle arms T. The upper forward ends of each pair of toggle arms each have a guide pin **22** mounted adjacent the outer end thereof and extending through a guide slot S in a bracket B. The ends of the other toggle arms T1 are pivotally mounted in an upper bracket B2 and the opposite end B3 of the toggle arms being pivotally mounted in the frame later described. Each pair of toggle arms is centrally pivoted as at P. There is a platform **23** that is supported by the toggle arms and this platform is spring loaded by means of similarly formed coil springs C, the upper ends of which springs engage beneath the inner side of the platform and the lower ends of the springs engage in a frame described later herein.

The aforementioned structures and combinations are clearly shown in my Patent No. 3,091,503.

The improved lock-down mechanisms include a rectangular frame R having an inturned ledge R' at one end and such frame is connected at its corners by welding or riveting or the like and has at the forward ends of opposite upstanding sides thereof similar elongated slots **24**. This frame rests on cross beams **25** and **26** that engage in opposite sides of the right angle main frame F. The toggle arms T1 are of different construction than in the toggle arms in my Patent No. 3,091,503. In the present invention, the toggle arms T1 are elongated and flat and each has on its inner side and welded thereto, a strip substantially similar in width to the toggle arms proper, and ad-

jacent the lower ends the strip is curved outwardly at **27** substantially the same on each toggle arm and providing between the same a space **28**.

Thus, it will be seen that the toggle arms of the present invention are greatly reinforced and, moreover, the substantially similarly curved portions each has an opening **29** therein, which openings are in alignment. The locking rod means, generally indicated at **30**, includes a shaft **31** with opposite end portions thereof disposed into the said openings in the curved part of the reinforced toggle arm and extending into the said spaces **28**. Attached as by welding **32** to this shaft are outwardly extending substantially flat spaced bars **33** and **34**, and to the ends of the bars **33** and **34** there is welded at **35** a latch rod **36**.

Mounted on the oppositely inwardly extending flanges **37** and **38** are similar keeper means **39**. This keeper means, as more clearly shown in FIG. 7, is comprised of a central flat portion **40** and an upstanding flange portion **41**, with a notch **42** therein and an inclined front edge **43** and a second locking position ledge portion **44** and a downwardly extending flange **45** welded at **46** to the frame R.

Attached to each forward end portion of the flat portion of the keeper means **39** is a relatively wide, flat curved downwardly extending latch rod elevating spring **47**. The end of each spring extends below the elongated slot **24** as shown in FIG. 8 for a purpose later to be described.

Centrally of the frame and the oppositely disposed latch means there is a relatively wide latch rod elevator bar means generally indicated at **48**, and which comprises an end flat portion **49** thereof welded as at **50** to the frame R, and then extending upwardly as at **51** and further continuing in a single plane as at **52** and curved downwardly as at **53** and welded at **54** to a brace plate X, the opposite marginal portions thereof being welded at Y to the respective opposite flanges of the frame R, and which bar **48** extends beyond the rear end **24'** of each slot **24**. The vertically opposite ends of the toggle arms **T1** are each slidably mounted in the respective slots S and **24** by means of the guide pin **22**.

It will be noted from FIG. 4 that the high point of the inclined portion **51** of the bar **48** is in advance of the respective ends of the down-turned springs **47**. There is a stop bar **55** welded at **56** to the reinforced toggle arm **T1** and the end portion **56'** thereof is adapted to engage the flat bar **34**.

The operation of the improved lock-down mechanism is that, when the platform **23** is in the uppermost position as shown in FIG. 1, the latch rod **36** will be in engagement with the flat portion **52** of the elevator bar means **48**, and as the platform is loaded and moves downwardly in the receptacle, the toggle arms slide in the slots S and **24** and on their pivots **B2** and **B3** and, of course, compress the coil springs in their downward movement, and when such downward movement has advanced sufficiently, the latch rod **36**, which is maintained above the respective ends of the springs **47** by the highest portion of the inclined portion **51** of the bar **48**, will engage the springs inwardly of their ends and will be elevated on the inclined portion thereof and then engage the sloped portion **43** of the keeper means and ride up on the same and then drop down into the notch **42**, which is the first lock-down position of the platform. With continued downward movement, the latch rod will ride upwardly on the inclined portion **43'** within the notch and then pass over the top of the notch portion and by gravity fall onto and be supported by the ledge portion **44** which is the lowest or second locking position of the platform, and this position is shown clearly in FIG. 2. From the second latch position, further movement of the toggle arm will move the latch rod off of the ledge and by gravity this latch rod will fall and rock on the shaft **31**, and this latch rod will then, by further movement of the platform, engage the flat portion **49** of the bar means **48**, and the end portions of the latch rod will be beneath the keeper means **39**. On further movement, the latch rod will ride up on the inclined portion **51**. The latch rod will emerge from beneath the keeper means and when doing so, the end portions of the latch rod that are beneath the springs **47** will engage the down-turned springs and snap past the same when the latch rod reaches the highest point of the incline **51**, and again the latch rod will then be resting on the elevated flat portion **52** of the bar means **48** for a repetition of this movement.

The components of the lock-down mechanism described and shown herein are of suitable metal.

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. Lock-down mechanism for textile handling apparatus including a receptacle, a frame and a spring loaded vertically movable platform in the receptacle, collapsible arms attached at their upper ends to the platform and at their lower ends to the frame, latch rod means pivotally mounted between the arms, the latch rod means carrying a latch rod, similar spaced latch rod keeper means carried by the frame, similar flat spring latch rod elevating means secured to each keeper means and extending forwardly and downwardly therebeyond and each having substantially aligned free ends, another latch rod elevating means fixed to the frame whereby downward movement of the platform in the receptacle effects movement of the latch rod on the latch bar elevating means to position the rod on the inclined downwardly extending portions of the spring elevating means and further movement of the platform effecting a locking of the latch rod in said latch rod keeper means and still further a downward movement effecting release of the latch rod from the keeper means, and an upward movement of the platform with the latch rod in engagement with said other latch rod elevating means it will be moved to a position above the ends of the spring means for a recycling of the aforesaid movement.

2. A lock-down mechanism as in claim **1**, wherein the collapsible arms are toggle arms in spaced pivoted pairs and with a lower pair of arms operatively associated with said lock-down mechanism, the toggle arms each being similarly reinforced and provided adjacent inner ends of said lower pair of arms with an inwardly extending integral curved portion with an opening therein and with said openings being in transverse alignment, the rod keeper means including a shaft with its respective end portions extending into the said openings and permitting the shaft to be turned, and elongated flat spaced bar means connected to the shaft and with their respective ends connected to the latch rod means.

3. A lock-down mechanism as in claim **2**, wherein the said other latch rod elevating means is a one-piece flat relatively wide strip having end portions substantially in the same plane and an inclined portion merging into an elongated flat portion, the highest point of the said inclined portion being slightly in the rear of the said free ends of the said flat downwardly extending aligned springs, the said relatively wide strip being held on the frame between the said spaced latch keeper means, whereby the latch rod is always properly positioned adjacent edge portions of each spring to begin its ascent up said portion of said other latch rod elevating means.

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

prised of a frame, reinforced toggle arms, the bottom of the toggle arms being slidable in guideways and including adjacent their lower ends outwardly extending portions providing a space therebetween and an opening in each of the outwardly extending portions and which openings are in alignment, a latch rod means including a shaft the ends of which are positioned in the openings and extended therebeyond into said spaces, the shaft having outwardly projecting spaced bars fixed to it and to said latch rod, a pair of spaced similar keeper means each having an upwardly opening notch and a ledge portion rearwardly thereof and a sloping inclined front edge, a similar shaped flat spring secured to each keeper means and extending forwardly and downwardly thereof and each having a free end spaced from said frame, another latch rod elevating means fixedly positioned between the keeper means, said rod elevating means included a substantially flat portion in one plane and a downwardly inclined portion the highest point thereof being slightly rearwardly of the extreme edges of each of the said spring rod elevating means and the downwardly inclined portion terminating in substantial alignment with an inner end of each of the keeper means and terminating in an end flat portion, the latch rod being positioned on the first mentioned flat portion of the other latch rod elevating means in the highest position of the platform and upon movement of said platform the end portions of the latch rod will engage the inclined downwardly extending springs and ride up thereover and up the inclined edges of each keeper means and into each of the said notches of the keeper means and this being the first

downwardly locked position of the platform and by further downward movement of said platform the latch rod will ride up on the inner inclined edge of each notch and by gravity engage the ledge of the keeper means and this being the second downward movement, and upon further movement of the platform the latch rod will drop down onto the second mentioned flat portion of said other rod elevating means and with opposite end portions of the latch rod beneath the keeper means and while moving engage the free ends of said flat springs and pass by the same while simultaneously engaging the inclined portion and then back onto the first mentioned flat portion of the elevating means for a repetition of this cycle of movement.

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U.S. Cl. X.R.

108—136; 220—93; 312—71