July 23, 1963 B. L. HARRIOTT 3,098,555

DISCHARGE ELEVATOR

Filed May 3, 1961

3 Sheets-Sheet 1

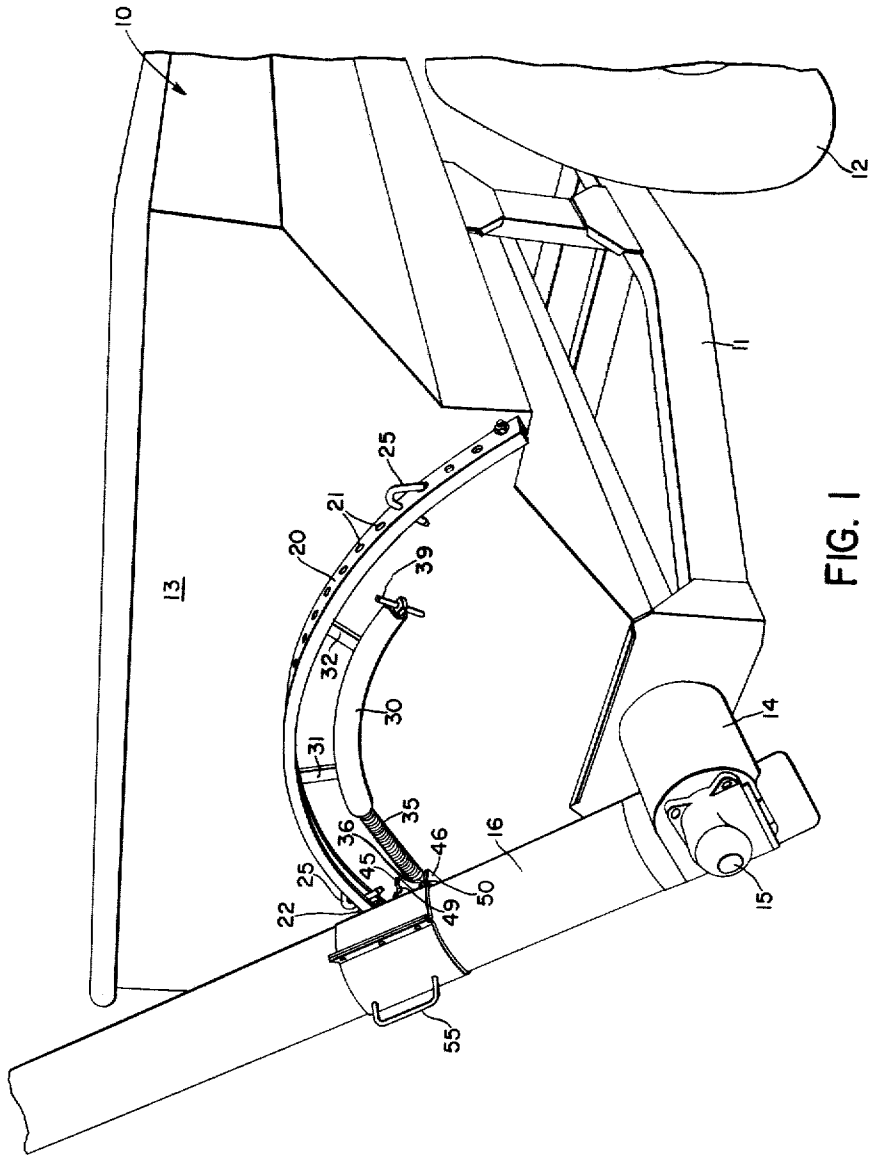


FIG. 1

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3 Sheets-Sheet 2

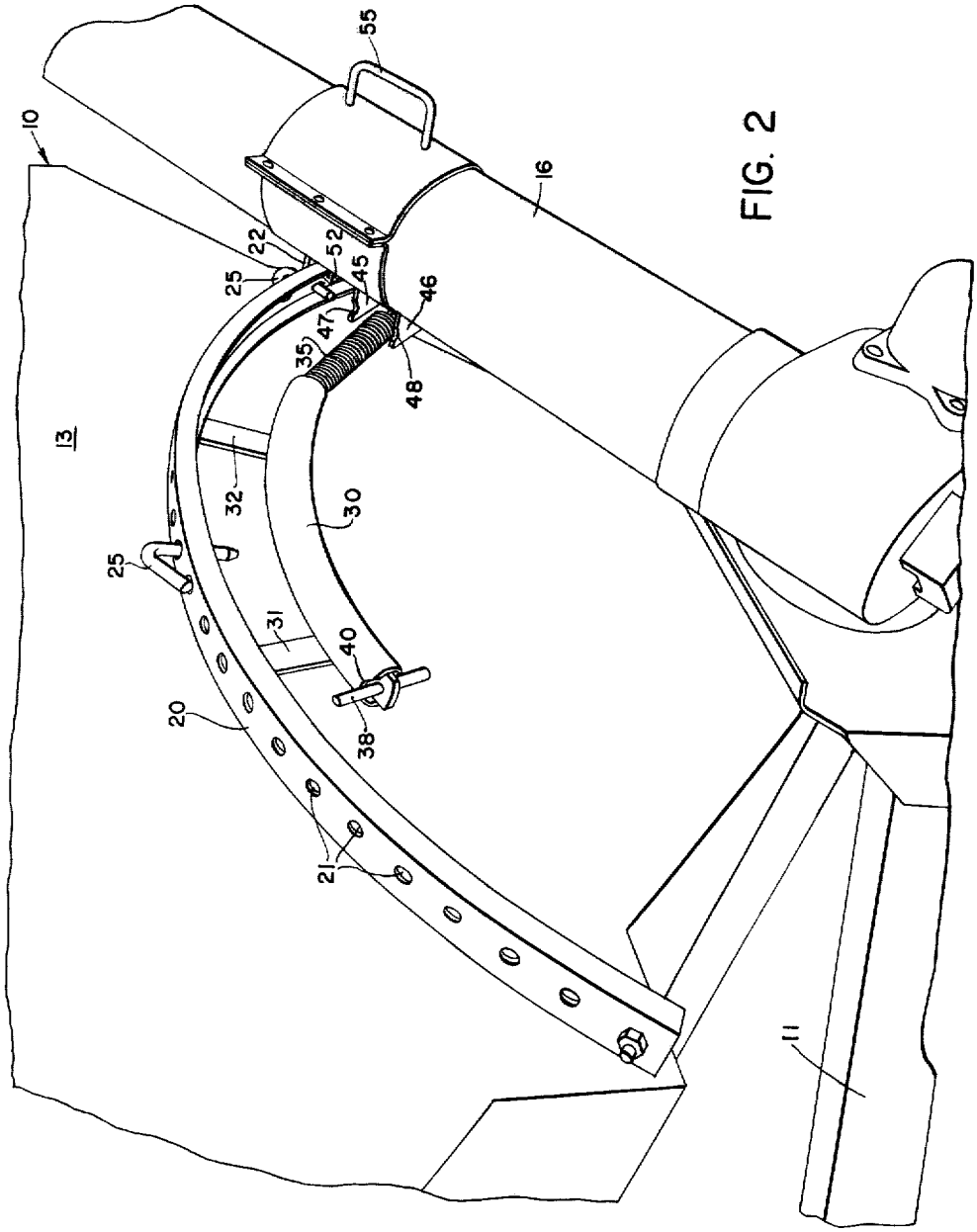


FIG. 2

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3 Sheets-Sheet 3

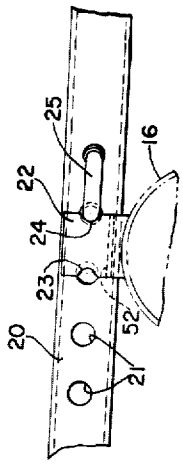


FIG. 4

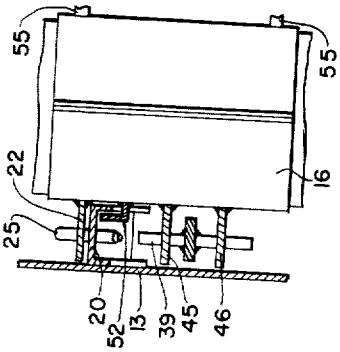


FIG. 6

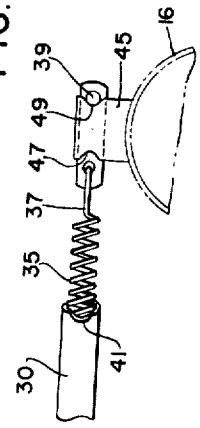


FIG. 5

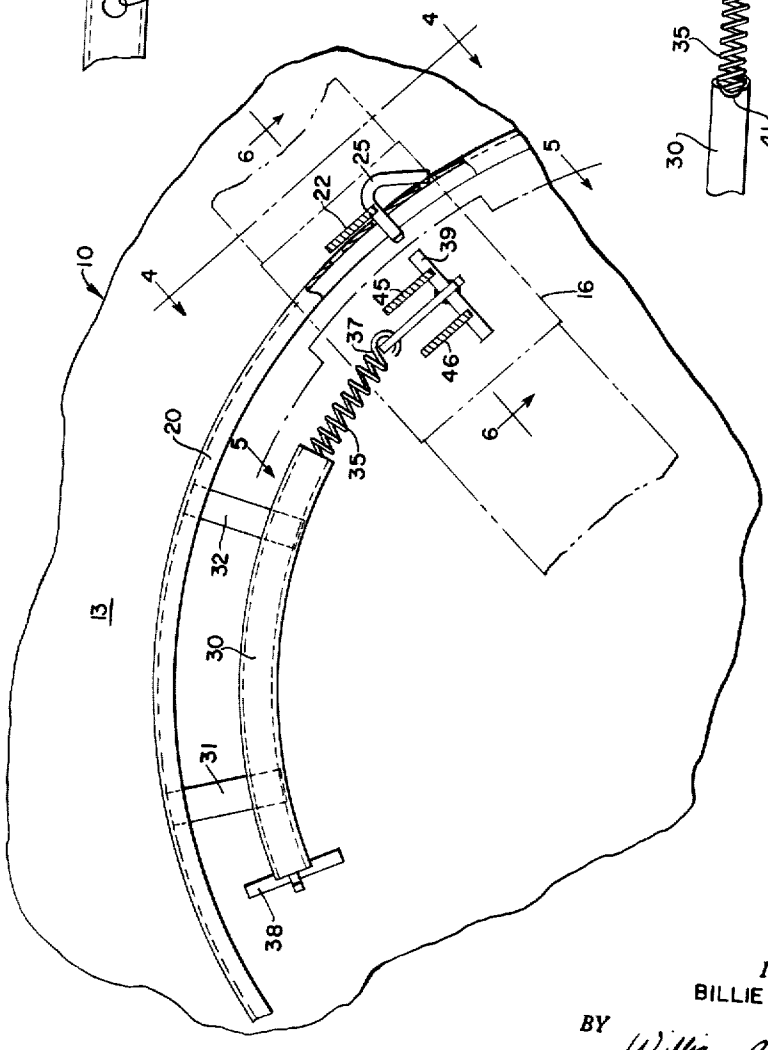


FIG. 3

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United States Patent Office 3,098,555 Patented July 23, 1963

3,098,555

DISCHARGE ELEVATOR

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Filed May 3, 1961, Ser. No. 107,474
8 Claims. (Cl. 198—122)

This invention relates to an elevator mounted on a self-unloading wagon or trailer. More particularly this invention relates to a device for the elevator which makes the elevator easy to reposition to various angles of discharge and also operates as a cushion or shock-absorber for the movable elevator.

In the conventional type of self-unloading wagon there is provided a material container or box which has an auger at its base feeding material to a vertically disposed elevator outside the box. The elevator is supported on the box so that it may swing about a horizontal axis at its lower end to permit discharge at both sides of the box and in some instances to discharge in the box. The latter would occur when the self-unloading wagon is used as a mixer for feed.

Often the elevator may be full of material when it is desired to move the elevator from one side to the opposite side. Consequently the weight of the elevator makes it very difficult to raise and to move. It is therefore the primary object of the present invention to provide a spring device which will aid in the initial movement of raising the elevator as it is swung from one side to the other. Also, it is an object of the present invention to utilize the spring as a cushioning or shock absorbing device to ease the manner of lowering the elevator as it reaches the extreme opposite side.

It is also an object of the present invention to incorporate with the spring device an arcuate shaped track which has a radius struck about the horizontal axis of the elevator. Provision is made to lock the elevator at various angular positions on the track.

Other objects and advantages of the present invention will become apparent to those skilled in the art as the nature of the invention is better understood from the following description and as shown in the accompanying drawings.

FIG. 1 is a rear perspective view of a portion of a self-unloading wagon utilizing the features of the present invention relative to its discharge elevator.

FIG. 2 is a further perspective view taken from the rear and side of the self-unloading wagon and showing a portion of the wagon.

FIG. 3 is a rear view of a portion of the self-unloading wagon showing the rear wall of the wagon and portions of the mounting device for the elevator. The connecting links to the elevator housing are shown in section.

FIG. 4 is a view taken substantially along the line 4—4 of FIG. 3.

FIG. 5 is a view taken substantially along the line 5—5 of FIG. 3.

FIG. 6 is a sectional view taken substantially along the line 6—6 of FIG. 3.

The self-unloading wagon, other than the features of the present invention, is similar in many respects to any of a group of conventional trailers now on the market. Such an unloading wagon is shown and described in U.S. Patent 2,767,963 which issued to A. Rinden et al. October 23, 1956.

The self-unloading trailer is composed of an elongated trailer body or box **10** supported on a main frame **11**, which in turn is supported on a pair of transversely spaced wheels, one of which is shown at **12**. The body **10** has a rear upright wall **13** which forms the end of the trailer body. Contained within the trailer body is a floor auger

not shown which extends outwardly of the trailer body and beyond the wall **13** to terminate in an auger housing **14**. The auger housing **14** is free to rotate about a longitudinal horizontal axis, as indicated by the end of the shaft **15**. Fixed to the auger housing **14** is an upright elevator as indicated by its housing **16**.

Fixed to the face of the wall **13** is an arcuate shaped track **20** having a series of openings **21** therein. The track **20** is formed about the axis of the shaft **15**. Fixed to the housing **16** is a forwardly directed bracket **22** which normally is positioned on top of the track **20**. The bracket or element **22** is provided with a pair of notches **23**, **24** which opens to opposite edges of the bracket **22** and is normally in registry with a pair of openings **21** in the track **20**. Pins **25** are provided to seat in the notches **23**, **24** and openings **21** so as to lock the elevator housing in a desired angular position. Also, as may be seen from FIG. 3, the pin **25** may be placed on one side of the bracket **22** so as to limit the degree that the elevator housing **16** may fall. Therefore in one sense the pins may be used as locking means for the elevator housing **16** and in another sense may serve as limiting means which determine the length of arc that the elevator may swing.

Positioned beneath the arcuate track **20** is an arcuate shaped tubular member **30** positioned above the shaft **15** and extending to opposite sides of the shaft. The member **30** is formed in its curvature about a radius struck substantially on the axis of the shaft. The arcuate member **30** is also fixed to the wall **13** by means of brackets **31**, **32** which may be welded or otherwise fixed to both the tubular member **30** and the wall **13**.

Contained within the tubular member **30** is an elongated resilient element or spring **35** which has opposite ends **36**, **37** extending beyond the ends of the tubular member **30**. Fixed to the end **36** is an upright rod element or lug **38** which engages the end of the tubular member **30**. Fixed to the end **37** is an upright lug **39** which is adapted to contact the opposite end of a tubular member **30**. The rod members **38**, **39** extend outwardly and beyond the ends of the tube **30**. The ends of the tubular member **30** are provided with notches such as **40**, **41** which have diverging edges leading to the ends of the member **30**. The purpose of so shaping the notches **40**, **41** is to guide the lug members **38**, **39** to an upright disposition when they contact the ends of the member **30**.

Extending from the elevator housing **16** toward the wall **13** are a pair of laterally disposed rigid elements **45**, **46** positioned above and below the arcuate tubular member **30** and the spring **35**. The elements **45**, **46** are provided with notches **47**, **48** on one of their respective edges and **49**, **50** on their other edges which are disposed to contact the rods **38**, **39** respectively, on the spring **35**.

As may be clearly seen from viewing the figures, the elements **45**, **46** are always disposed between the lugs **38**, **39** and unless the elevator is held in an upright position or within the limit of arcuate movement defined by the length of the arcuate tubular member **30**, the elements **45**, **46** will always be in contact with one or the other of the rods or lugs **38**, **39**, and one of the rods or lugs will be in contact with the end of the tubular member **30**. An L-shaped bracket **52** is fixed to the housing **16** and has a flange extending behind the forward flange of the track **20** so as to stabilize the housing in a fore and aft direction.

In operation, as the elevator housing **16** is released from its locked position by removing one or more of the pins **25**, the spring **35** will operate as a force tending to raise the elevator and to swing it toward its upright position. Since the elevator housing would be most difficult to move when it is in either of its extreme low positions, the force of the spring **35** will at those points be its

greatest. As the elevator **16** is moved toward the vertical or adjacent to the tubular member **30**, there will be very little effort required to force it into an over-center position. However, as the elevator passes over center it will tend to fall due to gravity. As it passes the end of the tubular member **30**, it will engage the lug on that end of the spring **35** and the spring **35** will then operate as a cushion for purposes of stopping the downward movement of the elevator **16**. It would normally be desired to place one of the pins **25** in a position which will stop the elevator in its downward movement so as not to extend the spring **35** beyond its limits. Once the elevator has been stopped, suitable pins **25** may be placed on opposite sides of the element or bracket **22** so as to latch the elevator housing in the desired position. Other features on the elevator, such as the manual gripping elements **55**, and the specific drive for the elevator has not been shown or described in detail since it is believed the fundamental invention to be disclosed pertains generally to the cushioning device as well as the mounting device of the elevator housing relative to the wagon box **10**.

While only one form of the invention has been shown it should be recognized that other forms and variations will occur to those skilled in the art. Therefore, while the present disclosure has been shown in concise and detailed manner for the purpose of clearly illustrating the principles of the invention, it is not intended to limit or narrow the invention beyond the broad concept set forth in the appended claims.

What is claimed is:

1. For use with a discharge elevator for a material container having an upright side wall, the elevator being of the type having a vertically disposed elevator housing adopted to swing about a horizontal axis and in a plane substantially parallel to the wall, the improvement comprising: a rigid tubular member fixed to the wall above the axis with opposite ends thereof extending to opposite sides of the axis, the tubular member further being arcuate shaped with a radius of curvature struck substantially on said axis; a coil spring contained within the tubular member with opposite ends thereof extending outwardly the respective ends of the member; lugs mounted on opposite ends of the spring and extending outwardly therefrom to contact the ends of the tubular member; an arcuate track spaced from the tubular member and mounted on the wall, the track being arcuate shaped with a radius of curvature struck substantially on the axis; rigid elements rigidly mounted on the elevator housing projecting toward the wall, part of the elements being positioned to engage the lugs on the spring and part of said elements being positioned alongside the track; and means on the track for locking the latter part of said elements against movement.

2. For use with a discharge elevator for a material container having an upright side wall, the elevator being of the type having a vertically disposed elevator housing adopted to swing about a horizontal axis and in a plane substantially parallel to the wall, the improvement comprising: a rigid tubular member fixed to the wall above the axis with opposite ends thereof extending to opposite sides of the axis, the tubular member further being arcuate shaped with a radius of curvature struck substantially on said axis; a coil spring contained within the tubular member with opposite ends thereof extending outwardly the respective ends of the member; lugs mounted on opposite ends of the spring and extending outwardly therefrom to contact the ends of the tubular member; and rigid elements rigidly mounted on the elevator housing projecting toward the wall and positioned between opposite ends of the spring to engage the lugs on the spring.

3. For use with a discharge elevator for a material container having an upright side wall, the elevator being of the type having a vertically disposed elevator housing adopted to swing about a horizontal axis and in a plane substantially parallel to the wall, the improvement comprising: a rigid arcuate shaped member fixed to the wall above the axis with opposite ends thereof extending to opposite sides of the axis; a coil spring supported by the member with opposite ends thereof extending beyond the respective ends of the member; lugs on opposite ends of the spring adapted to contact the ends of the member and including lug portions extending outwardly therefrom; and rigid elements rigidly mounted on the elevator housing projecting toward the wall and positioned between opposite ends of the spring to engage the lug portions on the spring.

4. For use with a discharge elevator for a material container having an upright side wall, the elevator being of the type having a vertically disposed elevator housing adopted to swing about a horizontal axis and in a plane substantially parallel to the wall, the improvement comprising: a hollow tubular member fixed to the wall above the axis with opposite ends thereof extending to opposite sides of the axis; a coil spring contained within the tubular member with opposite ends thereof extending outwardly the respective ends of the member; lugs mounted on opposite ends of the spring and extending outwardly therefrom to contact the ends of the tubular member; and a rigid element mounted on the elevator housing projecting toward the wall and disposed between the lugs so as to engage the lugs on the ends of the spring as the elevator housing swings adjacent the respective end of the tubular member.

5. The invention defined in claim 4 further characterized by means mounted on the wall for locking the elevator housing in a plurality of positions.

6. The invention defined in claim 4 further characterized by the ends of the tubular member having notches therein and opening to the ends with each of the notches having inclined edges diverging to the respective ends so as to guide the lugs to an upright disposition as the lugs contact the ends of the tubular member.

7. The invention defined in claim 6 in which the elements extending from the housing are disposed to contact the lugs as the housing swings adjacent thereto and to maintain contact with the lugs as the elevator swings beyond the respective end of the member and to extend the spring.

8. For use with a discharge elevator for a material container having an upright side wall, the elevator being of the type having a vertically disposed elevator housing adopted to swing about a horizontal axis and in a plane substantially parallel to the wall, the improvement comprising: a hollow tubular member fixed to the wall above the axis with opposite ends thereof extending to opposite sides of the axis; a resilient element contained within the tubular member with opposite ends thereof extending outwardly the respective ends of the member; lugs mounted on opposite ends of the element and extending outwardly therefrom to contact the ends of the tubular member; and a rigid element mounted on the elevator housing projecting toward the wall and disposed between the lugs so as to engage the lugs on the ends of the resilient element as the elevator housing swings adjacent the respective end of the tubular member.

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