March 21, 1961 D. W. GREEN 2,976,002

HOLDER AND GUIDE MEANS FOR GRAIN SPOUTS AND THE LIKE

Filed April 29, 1959

FIG. 1

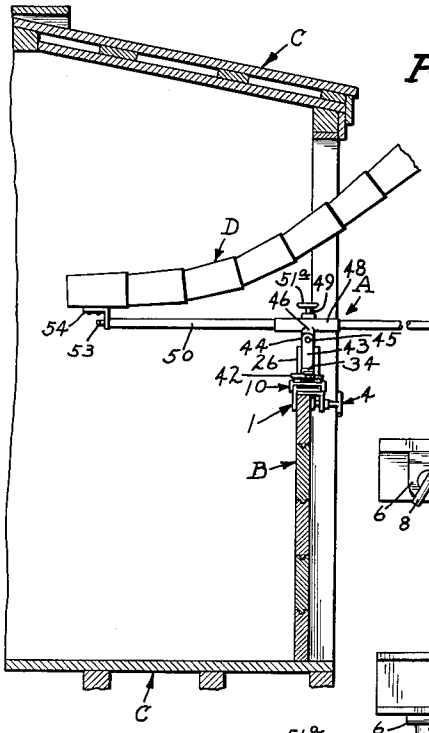


FIG. 2

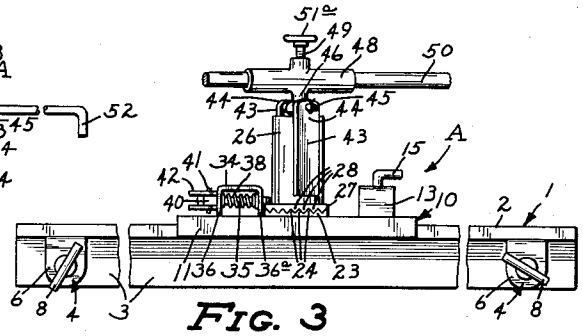


FIG. 3

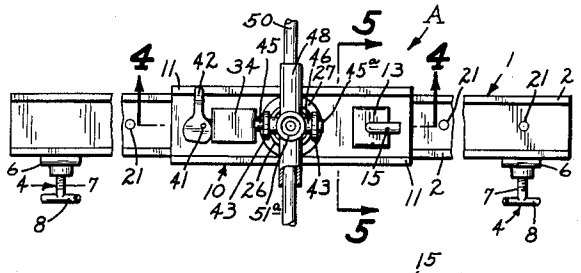


FIG. 7

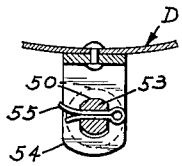


FIG. 4

FIG. 5

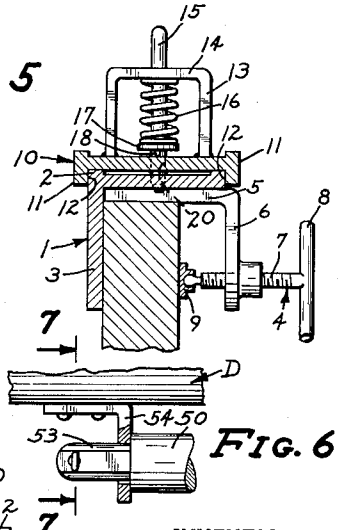


FIG. 6

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HOLDER AND GUIDE MEANS FOR GRAIN SPOUTS AND THE LIKE

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2 Claims. (Cl. 248—226)

This invention relates to an improved means for facilitating the loading of bulk materials into a movable container from a fixed storage area and has particular reference to the problem of guiding and supporting the terminal end of a flexible spout adapted to convey bulk materials such as grain and the like from an elevator to a box car.

Previous devices used for guiding and supporting a flexible grain spout during the delivery of grain to the interior of a box car have been characterized by various mounting brackets attachable either to the wall of the elevator or to portions of the car structure. The former type has proved quite unsatisfactory because of the rigid space limitations imposed by the fixed position of the bracket and because of the inconvenience suffered by the presence of a projecting structure during periods of non-use. The majority of prior art devices attachable to the box car proper lack the required rigidity and spatial freedom necessary for the complete and efficient loading of a box car by one operator stationed at all times outside of the car. For example, one of such devices employs a rod having a pointed end engageable with the upper edge of a box car door, the opposite end being in contact with the delivery spout. A study of the forces upon the rod will enable one to see that continual vertical and horizontal loading components present in the spout can easily cause the rod to slip or become displaced. Another device uses a single clamp bracket to absorb the load of the spout leading to similar results.

This it is apparent that improved facile means for rigidly restraining the delivery end of the grain spout while at the same time permitting enough spatial movement to adequately fill the entire car from an outside vantage point are necessary. The device must also be easy to manufacture from standard shapes and materials and should be low in cost.

Accordingly it is a primary object of this invention to provide an improved means for facilitating the loading of bulk materials into a box car from a flexible spout.

Another object of the present invention is to provide a flexible grain spout support characterized by extreme rigidity and strength.

Yet another object of this invention is to provide in a holder and guide means for grain spouts and the like novel means for locking said device in a selected position.

Another object of this invention is to provide facile means for changing the position of the terminal end of a grain spout in a box car.

A further object of this invention is to provide novel structure in a grain spout holder and guide capable of distributing loads imposed thereon to the entire upper edge of the box car door.

Still another object of this invention is to provide a grain spout holder and guide means adapted to permit the loading of an entire box car without the necessity of entering the car.

Another object of the present invention is to provide

novel and improved means for releasably securing the movable components of a grain spout holder and guide means in a variety of selected positions.

Another object of the present invention is to provide in an improved grain spout holder and guide means novel structure adapted to permit movement in both the vertical and horizontal planes.

Still other and further objects will at once become apparent to those skilled in the art from a consideration of the following detailed description taken in conjunction with the accompanying drawing in which is shown a preferred embodiment of the invention by way of illustration only.

Referring to the drawings wherein like characters indicate like parts throughout the several views:

Fig. 1 is a vertical transverse section taken centrally through a box car showing the invention applied to the bulkhead thereof;

Fig. 2 is a side elevational view, with portions broken away, of the invention;

Fig. 3 is a plan view of the invention, with portions thereof broken away;

Fig. 4 is an enlarged fragmentary section taken on the line 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmentary section taken on the line 5—5 of Fig. 3;

Fig. 6 is an enlarged fragmentary elevational view, partially in section, illustrating a feature of the invention; and

Fig. 7 is a section taken along the line 7—7 of Fig. 6.

As shown in Fig. 1, the invention A is attached to the upper edge of the door or bulkhead B of box car C. Pivotally connected to the inner end of the invention is flexible spout D which is made up of a plurality of similar tapering sections of the type commonly employed in the granular material handling art.

The device, as set forth in Figs. 2 to 5, includes an L-shaped elongated mounting plate **1** having external vertical edges forming ways **2** and a depending side wall **3**. Mounting plate **1** is positioned on the upper edge of grain door B by means of longitudinally spaced clamp members **4**. Clamp members **4** are characterized by horizontal arms **5** which terminate in vertical arms **6** which are adapted to threadedly receive clamp screws **7**. Each screw **7** has hand engageable means **8** at the outer end thereof and a button **9** at the inner end thereof adapted to engage the exterior side wall of door B. Clamp members **4** are preferably welded to the undersurface of mounting plate **1** to form therewith a strong integral mounting assembly. Under normal practice, the length of mounting plate **1** is approximately equal to the width of a standard car door, although other lengths may be used as conditions warrant.

Longitudinally positioned astride mounting plate **1** is carriage **10** having relatively short side walls **11**, the inner surfaces **12** of which slidably contact ways **2** of mounting plate **1** to provide longitudinal sliding movement of carriage **10** over mounting plate **1**. Adjacent one end of carriage **10** is U-shaped bracket **13** having an aperture in the top leg **14** thereof adapted to slidably receive locking pin **15**. Locking pin **15** is biased in a normally downward position by coil spring **16** suitably restrained against engagement with the upper surface of carriage **10** by means of washer **17** and cotter key **18**. An aperture **20** in carriage **10** allows pin **15** to protrude therethrough to contact one of a plurality of holes **21** spaced along the longitudinal centerline of mounting plate **1**. Means for grasping pin **15** is accomplished by a right angle bend at the upper end thereof.

An upright support **23** having a shallow cylindrical body integral with carriage **10** is located intermediate the ends thereof, as shown in Fig. 4. Support **23** includes a

plurality of toothed elements 24 arranged upon the periphery thereof and projecting upwardly from carriage 10. Formed integrally with support 23 and extending upwardly therefrom is central post 25. Hollow cylindrical sleeve 26, having an enlarged annular lower section 27 of the same diameter as support 23, is engageable with support 23 by virtue of toothed elements 28 that are complementary to and mesh with toothed elements 24 of support 23. A horizontal annular inner wall 29 at the lower end of sleeve 26 is provided through which central post extends. Sleeve 26 is biased into engagement with support 23 by means of coil spring 30 concentrically positioned about central post 25. A nut 31 threaded upon central post 25 and cotter key 32 serve to restrain the axial movement of spring 30. Washer 33 provides a bearing surface for the upper end of spring 30 while the lower end thereof is in abutting engagement with wall 29 of sleeve 26.

Immediately adjacent support 23 and located remote from bracket 13 is U-shaped bracket 34 having a longitudinal axis coincident with the longitudinal axis of carriage 10. A horizontal pin 35, slidably mounted in holes formed in depending legs 36 and 36*a* of bracket 34, is adapted to engage the upper surface of annular section 27 of sleeve 26 by means of the inner end 37 thereof protruding beyond depending leg 36*a* adjacent support 23. Coil spring 38, concentrically engageable with and secured to pin 35 within bracket 34 by means of lock washer 39, urges pin 35 in a normally exposed and protruding position in contact with the upper surface of annular section 27 to thereby prevent the separation of mating toothed elements 24 and 28. This construction insures the positive locking of sleeve 26 in the desired angular position. Pin 35 has an enlarged head 40 abutting the exterior surface of leg 36 through which is pinned, by means of fastener 41, a cam lever 42 adapted to provide proper leverage for the easy withdrawal of pin 35 from sliding contact with the upper surface of annular section 27 of sleeve 26.

Fastened, as by welding, to opposite sides of sleeve 26 are identical vertical lugs 43 which extend upwardly therefrom to form spaced bearing supports 44 having holes 44*a* in horizontal register with each other. A cylindrical journal 45 having a head 45*a* is positioned between lugs 43 in spaced vertical relation with the upper end of sleeve 26. Cotter key 45*b* at one end of journal 45 in conjunction with head 45*a* at the other end thereof serves to retain journal 45 in place.

Rotatably mounted upon journal 45 is saddle 46 having a cylindrical lower base 47 of sufficient length to fit between lugs 43. Integral with base 47 of saddle 46 is guide 48, of tubular cross section and disposed perpendicular to base 47 and journal 45. A slender elongated cylindrical control rod 50 adapted for slidable axial movement within guide 48 is contained therein. Set screw 49 threadedly mounted into upper shoulder 51 of saddle 46 and equipped with circular hand wheel 51*a* provides means for securing rod 50 in a desired axial position. Control rod 50 terminates at the outer end thereof in a handle 52 and at the inner end thereof in a swaged rectangular section 53 adapted to fit loosely within a rectangular aperture in angle 54, which is secured to the free end of the grain spout D. A suitable fastener, such as cotter key 55, may be used to affix angle 54 to the inner end of control rod 50.

The device is installed for use by firmly clamping mounting plate 1 to the upper horizontal edge of grain door B by means of clamp members 4. For the beginning of the loading operation of box car C, the upper movable assembly of the invention carried by carriage 10 is positioned at one end of plate 1 by means of locking pin 15 and holes 21. The withdrawal of horizontal pin 35 from contact with the upper surface of annular section 27 permits the disengagement of toothed elements

24 and 28 and rotation of control rod 50 about a vertical axis. Spring 30 is strong enough to firmly hold toothed elements 24 and 28 together but not so strong as to prevent the facile change of the angular position of control rod 50. Of course, the release of horizontal pin 35 locks sleeve 26 in position, independent of spring 30. Control rod 50 may also be moved about its horizontal axis to raise or lower the end of grain spout D. Lateral movement of spout D is facilitated by the axial movement of control rod 50 through tubular guide 48.

It can be readily appreciated that little, if any, lost motion is consumed during the loading operation. The freedom of movement of control rod 50, inherent in its ability to rotate about both the horizontal and the vertical axes as well as in the axial direction, enables all sections of the car to be filled with a minimum of trouble.

The even distribution of the load imposed by the terminal end of grain spout D upon control rod 50 by means of mounting plate 1 and spaced clamp members 4 prevents the undue stressing of grain doors B and their possible failure. This is particularly important when the doors are in poor condition due to continuous and prolonged use. Rigidity of the structure is enhanced by the slidable carriage feature as well as by the positive manner in which the rotatable toothed elements are locked together.

Thus there has been described a new and improved device for supporting and guiding the free end of a spout adapted to handle granular material. The construction is simple, highly efficient in operation and permits the easy handling of the materials described without the necessity of getting into the box car.

It will, of course, be understood that various details of construction may be varied through the wide range from the principles of this invention and it is, therefore, not proposed to limit the patent granted hereon otherwise necessitated by the scope of the appended claims.

What I claim is:

1. A holder and guide means for grain spouts and the like comprising a longitudinal elongated mounting plate adapted to be removably clamped to the upper edge of a box car grain door, said plate having ways to slidably receive a carriage thereon and having a plurality of spaced holes therein, a carriage slidable on said plate engageable with the ways thereof, spring urged stop means on said carriage adapted for positioning in a selected hole in said plate, a first shallow cylindrical body on said carriage having toothed elements projecting upwardly therefrom, a second shallow cylindrical body having downwardly projecting toothed elements engageable with the toothed elements of said first body and having a central aperture therein, a vertical post integral with said first body extending through the central aperture of said second body, a vertical hollow sleeve of lesser diameter than and integral with said second body adapted to enclose said post, spring means on said post for biasing said second body into intimate contact with said first body, a releasable stop horizontally engageable with the upper surface of said second body, spaced means attached to said sleeve for pivotally carrying a horizontal support member thereabove, a horizontal support member pivotally mounted between said spaced carrying means in spaced relation to the upper end of said sleeve, means normal to and integral with the upper surface of said horizontal support member for receiving a control rod, a control rod slidably mounted in said receiving means adapted to be releasably positioned in a selected axial position, and means on said rod for pivotally engaging the terminal end of a grain spout.

2. A holder and guide means for grain spouts and the like comprising an elongated mounting plate securable to the upper edge of a grain door, said mounting plate having a depending wall adapted to engage the inner wall of the grain door, spaced clamp members integral

with said mounting plate cooperable with the depending wall of said mounting plate for removably attaching said mounting plate to the grain door, said mounting plate having spaced holes along the longitudinal centerline thereof and having smooth vertical edges defining ways, a carriage slidable along the ways of said mounting plate, said carriage having a hole centrally positioned therein in register with the spaced holes of said mounting plate, a vertical pin mounted on said carriage coaxial with the hole therein, means for biasing said vertical pin in a normally downward position, a shallow cylindrical upright support intermediate the ends of said carriage, said upright support having toothed elements projecting upwardly therefrom, a central post within said upright support, a cylindrical sleeve coaxial with said central post having downwardly projecting toothed elements cooperable with the toothed elements of said upright support, means within said sleeve for biasing said sleeve into contact with said upright support, means without said sleeve

and mounted on said carriage for locking together said sleeve and said upright support, a pair of spaced lugs attached to the outside of said sleeve and projecting thereabove, a horizontal bearing member positioned between said lugs above said sleeve, tubular guide means swingable about said bearing member, a control rod axially movable within said tubular guide means, means for fixing said control rod in a selected position within said tubular guide means, and means for attaching an inner end of said control rod to the free end of a grain spout.

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