Feb. 6, 1962 M. R. WENSCHLAG 3,019,879

GRAIN LOADING DEVICE

Filed June 15, 1959

FIG. 1

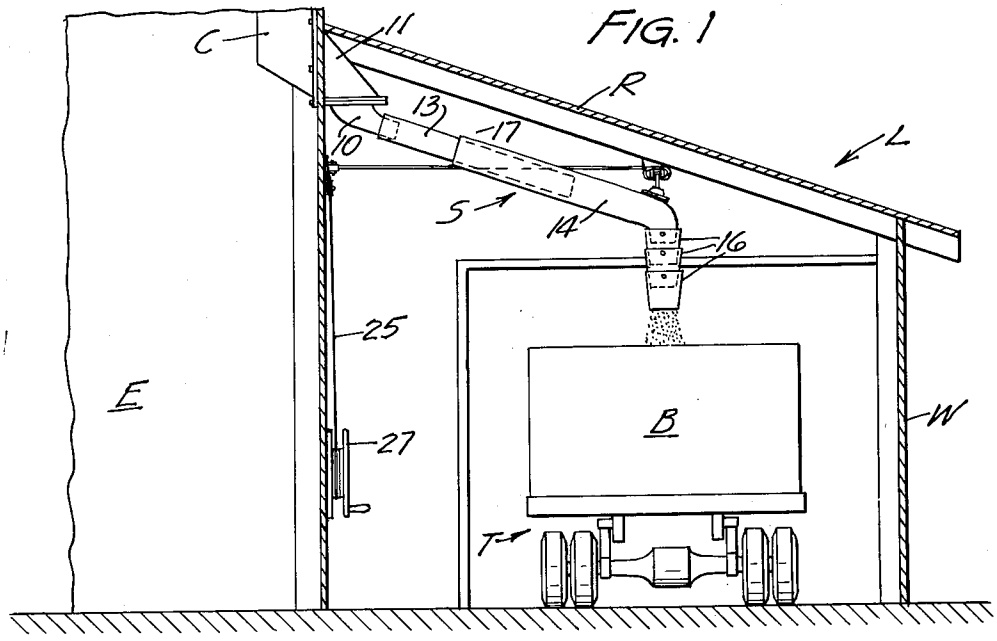


FIG. 2

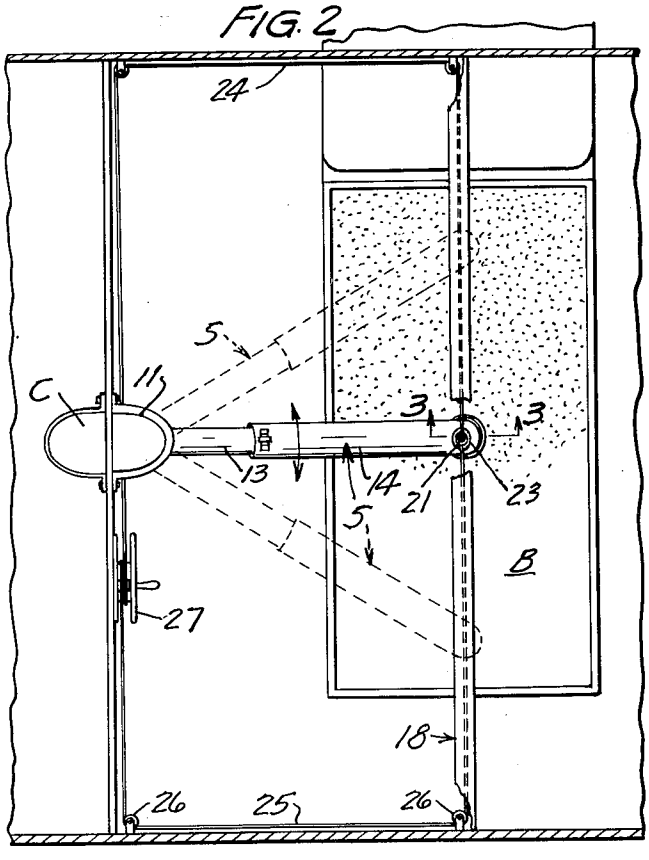


FIG. 3

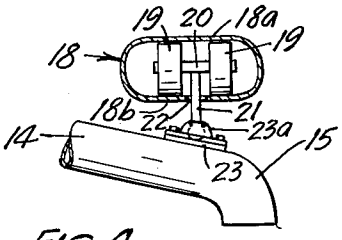


FIG. 4

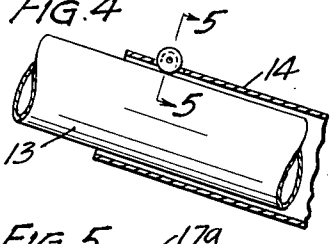
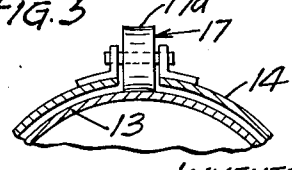


FIG. 5



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GRAIN LOADING DEVICE

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This invention relates to delivery chutes or spouts and in particular to an improved swivel type spout particularly suitable for delivering grain from an elevator to a transport vehicle such as a wagon, truck or railroad car having an open topped material receiving box.

Although this invention finds particular usefulness in delivering grain to a transport vehicle, it is contemplated that it will find use for delivering other types of material and for use in other situations where it is desirable to deliver material from a container to a variety of widely dispersed receiving points.

In the loading of grain from an elevator to an open topped wagon, truck or railroad car, the vehicle is normally parked in a loading shed and disposed beneath or adjacent to an overhead grain bin from which the grain is delivered to the box of the vehicle by means of a spout or chute of various well known designs and familiar to those skilled in the art. Occasionally, these delivery spouts are fixed in nature and discharge the grain from a fixed position above the box. Since it is desirable to have the box of the transport vehicle substantially evenly loaded throughout, it becomes necessary to either periodically move the vehicle itself during the loading thereof to position the discharge end of the spout above different portions of the box or a workman must manually level and distribute the grain as by shoveling to the portions of the box not accessible to the discharge spout.

More commonly, the delivery spout is swivelly mounted so as to swing through a fixed arc of predetermined radius, which swivelly mounted spout is normally manually swung to position the discharge spout at a variety of points above the receiving box along said arcuate path. However, these swinging type spouts are also fraught with certain disadvantages caused by the requirement that the discharge spout follow an arcuate path of predetermined radius which does not permit the discharge spout to deliver the grain uniformly throughout the length of the box, which boxes are normally of elongate rectangular configuration, but instead delivers the grain in irregular, uneven fashion, the vehicle sometimes requiring periodic re-spotting during loading to prevent spilling over the sides and to obtain a relatively uniform load.

The most desirable way to load vehicles having material receiving boxes of this type is to deliver the grain uniformly along the longitudinal axis of said box throughout the entire length thereof, and this may now successfully be done by the improved grain spout of my invention.

Therefore, an important object of my invention is an improved grain spout of novel design and construction which enables the receptacle to be progressively and uniformly loaded in substantially straight line fashion throughout the entire length thereof.

Still another object is a grain spout of the class described which may be mechanically moved or swung from side to side with a minimum amount of effort on the part of the operator.

Still another object is a swivelly mounted extensible grain spout whose length is automatically adjusted as the discharge end of the spout travels above the receptacle from one end of the receptacle to the other along a straight predetermined path.

A more specific object is a swivelly mounted extensible grain spout consisting of elongate telescopically engaged sections having novel means associated therewith for maintaining the walls of the telescoped sections in uniformly spaced relationship to prevent binding thereof during retracting and extending movements thereof and substantially reduce the frictional resistance and binding normally encountered by the sliding engagement of two metallic surfaces with respect to one another.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a side elevational view of the grain spout of my invention in mounted operative loading relationship;

FIG. 2 is a top plan view of FIG. 1 with the roof removed;

FIG. 3 is a detail sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary detail view in partial section of a portion of the telescoped members; and

FIG. 5 is a fragmentary detail section taken on the line 5—5 of FIG. 4.

Referring to the drawings, which illustrate a preferred embodiment of my invention, the spout of my invention indicated generally by S is shown suspended from the downwardly inclined rafters R of an overhanging roof of a loading shed L attached adjacent a grain elevator E and having side walls W. Beneath the discharge end of the spout S is disposed a suitably positioned transport vehicle such as a truck indicated generally by T having an elongate rectangular shaped material receiving box B. The receiving end of the spout S is attached to or mounted on a swivelly mounted turnhead or delivery funnel 10 of well known design and construction which is swivelly mounted to the side bin attachment or hopper member 11 which is mounted on the side wall W of the grain bin or elevator E and which communicates with a grain chute C disposed interiorly of the grain bin, the upper end of which communicates with grain storage compartments not shown.

The preferred embodiment of my invention as shown in the drawings consists of an upper tubular member or section 13 and a lower tubular section or sleeve 14, the upper member 13 being telescoped within and enclosed by the lower member 14 in the form shown in the drawings, said lower member 14 being freely and longitudinally movable with respect to upper member 13. The lower section 14 is provided at its discharge end with an elbow 15 adapted to direct the grain directly downwardly. The elbow 15 may be detachably provided with a plurality of flex spouts 16 which are extensibly interconnected and slightly downwardly and inwardly tapered to permit easy telescoping within one another, said flex spouts 16 being employed if desired to extend the downward length of the discharge spout and permit the grain to be discharged immediately above the truck box B rather than from a high elevation where the grain might tend to scatter.

As best seen in FIGS. 4 and 5, the lower sleeve member 14 is provided adjacent its upper end with a roller member 17 which is mounted to the top thereof through a suitable opening provided therein, said roller member preferably having a concave or grooved periphery 17a corresponding to the curvature of the upper member 13 to permit said roller member 17 to readily engage and roll thereon. The roller member 17 provides a freely rotatable bearing member and serves to maintain the sleeve members 13 and 14 in spaced apart relationship and provides a free wheeling bearing surface to prevent binding and reduce friction between the two sleeve mem-

bers during the course of any telescoping or extending movement between them.

The forward end of the spout adjacent the elbow 15 is suspended from a straight elongate cannon ball track or trolley 18 which in operation is preferably disposed above and in alignment with the longitudinal axis of the box B of the vehicle as best seen in FIG. 2. The spout is swivelly suspended for free rotation about a vertical axis from this track or trolley 18, which track and the mounting means therefor may take any suitable form. The discharge end of the spout is preferably suspended from the track in such fashion that the wall of the lower section 14 is maintained in substantially parallel, non-engaging relationship with the wall of the upper section 13, so that the walls of the telescoped members do not make contact with one another regardless of their relative positions.

In the preferred embodiment of my invention shown in the drawings, and best seen in FIG. 3, the track itself consists of a channel of annular cross-section having substantially parallel top and bottom sides 18*a* and 18*b* respectively. Disposed within the track or trolley are a pair of rollers 19 which are interconnected by a common axle 20. Suspended from said axle 20 is an elongate hanger element 21 which extends through a suitable narrow slot 22 in the bottom 18*b* of the track, which slot extends continuously the full length of the track. The spout is swivelly suspended from the hanger 21 by means of a bracket 23 secured thereto as by welding and a ball joint coupling 23*a* interconnecting the hanger 21 and the bracket 23. Thus, the rollers disposed inside the track or trolley 18 are adapted to roll freely along the length thereof and interiorly thereof, the swivel joint between the elbow and the hanger elements permitting the elbow to swivel and freely change position as it progressively follows the straight line path provided by the track in moving from one end of the track to the other.

To motivate the spout and move or drive it along the track, any suitable means may be employed. In the form shown, cables 24 and 25 are suspended from and guided by suitable pulleys or sheaves 26 and driven or moved by a control wheel or windlass element 27. The cables 24 and 25 extend in opposite directions from the control wheel 27 and are reversibly wound thereon in well known fashion and by the use of suitable pulleys 26, are interconnected with the forward or discharge end of the spout adjacent the elbow 15 to any suitable connection carried by the spout or to the bracket itself. Thus, when the control wheel is turned or wound in one direction it unwinds one of the cables and winds up the other cable thus causing the spout head to be pulled or moved in one direction and the reverse holds true when the control wheel is turned or wound in the opposite direction.

Although in the form of my invention illustrated and shown, a manually operated wheel is shown and described, it is to be clearly understood that it is within the scope of my invention to provide power means for operating said control member 27 and moving said grain spout along the track so that the movement can be controlled simply by switches or buttons manipulated by the operator.

From the foregoing it can be seen that the operation of my invention is very simple but very effective. To evenly load the box of a truck, wagon or open topped railroad car, all that is necessary is that the box be spotted or disposed directly beneath the track with its longitudinal axis substantially in alignment therewith. The discharge end of the grain spout is then caused to travel to one end of the track adjacent one end of the box by means of the control wheel, the freely extensible sections of the spout automatically extending as the discharge end is moved further and further away from the turnhead along the track, the spout assuming one of the extended dotted positions of FIG. 2. The loading is then begun and as the box is filled in a given spot, the discharge end of the spout is slowly and progressively moved along the track towards the other end of the box permitting the box to be steadily filled along a straight line and centrally of the box. As the spout travels from one end of the box to the other, it reaches its most telescoped or retracted condition when disposed at right angles to the track as indicated by the solid line position of FIG. 2, the spout automatically and freely extending and retracting as it travels the length of the track without any help either mechanical or manual being needed on the part of the operator other than the turning of the control wheel itself to move the spout along the track. When the spout has reached the end of its travel and the loading of the box has been completed, a gate is simply closed shutting off the grain from the spout and the truck or transport vehicle is ready to be driven off without any further actions being necessary on the part of the operator to level the grain in the box itself, and without having had to respot or reposition the vehicle during the loading operation.

Thus, from the foregoing, the advantages of my invention are readily apparent. Not only is the spout of simple design and construction and not only does it permit the receptacle box of the transport vehicle to be evenly loaded throughout the entire length thereof without subsequent moving or respotting of the truck or shoveling of grain on the part of the operator but also effects a considerable saving in time and effort on the part of all concerned.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What I claim is:

1. In combination, a fluent material storage structure having a discharge opening in the side wall thereof, an elongate inclined material conveyor comprising a plurality of sections telescopically interconnected for relative extensible and retractable movement therebetween, means interconnecting the upper receiving end of said conveyor with said discharge opening for swinging movement of said conveyor in an inclined plane about a vertical axis, straight track means disposed above the leading section of said conveyor and laterally of said axis, conveyor supporting means movable on said track, and means pivotally suspending said conveyor from said supporting means for straight line movement of the delivery end of said conveyor perpendicular in space to said axis and for swinging movement about a vertical axis, the trailing section of said conveyor swinging about said axis in response to the linear movement of the delivery end.

2. In combination, a fluent material storage structure having a discharge opening in the side wall thereof, an elongate inclined material conveyor comprising a plurality of sections telescopically interconnected for relative extensible and retractable movement therebetween, means pivotally interconnecting the upper receiving end of said conveyor with said discharge opening for swinging movement of said conveyor in an inclined plane, straight track means disposed generally laterally of and parallel to said side wall, conveyor supporting means movable on said track, and means pivotally mounting the lower end of said conveyor on said supporting means for swinging movement about a vertical axis and for travel along a straight path generally paralleling said side wall and perpendicular in space to said axis for unobstructed delivery of material to a receptacle disposed therebelow.

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