May 3, 1966 D. E. BUSKIRK 3,249,192

FLEXIBLE DISPENSING CHUTE ATTACHMENT

Filed Oct. 19, 1964

Fig. 1.

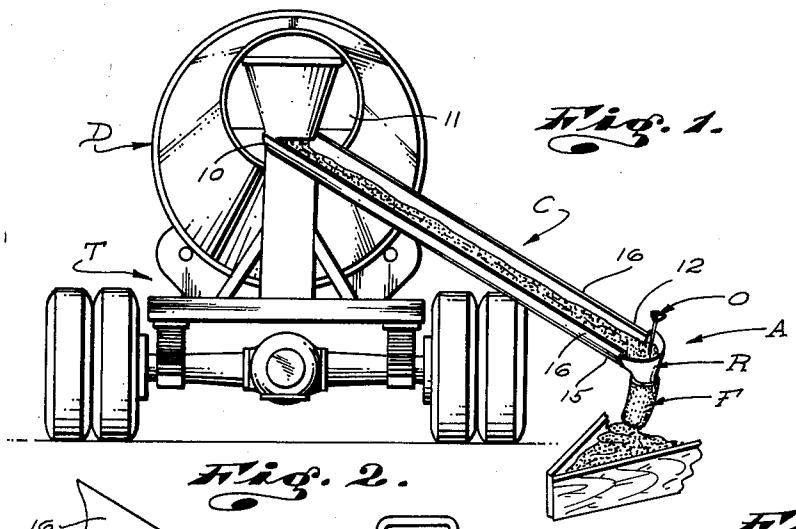


Fig. 2.

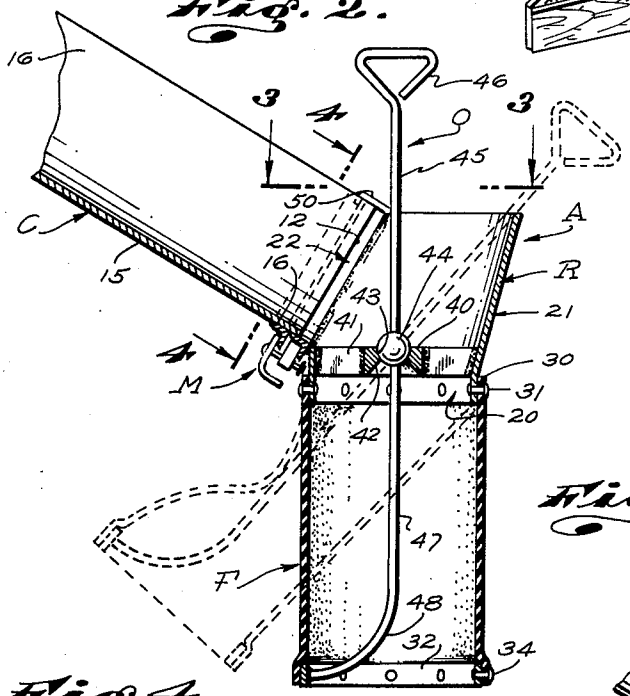


Fig. 3.

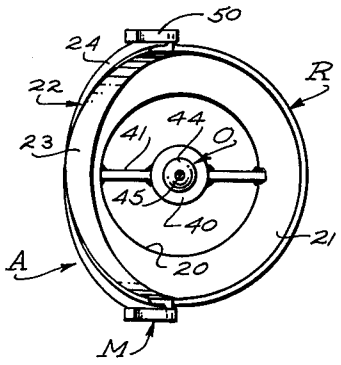


Fig. 4.

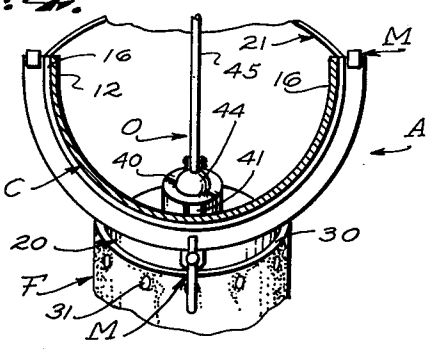
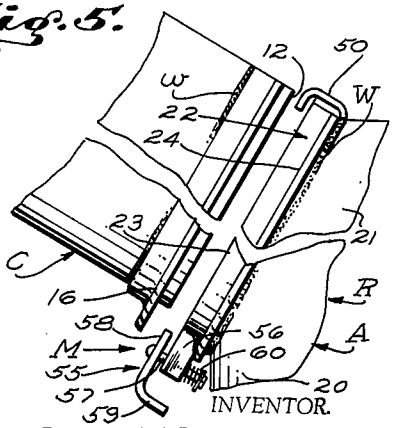


Fig. 5.



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FLEXIBLE DISPENSING CHUTE ATTACHMENT

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This invention has to do with a dispensing chute attachment and is more particularly concerned with a novel attachment applicable to the discharge end of an elongate cement dispensing chute.

It is presently common practice to mix cement in transit mixer trucks during transit from a supply station to a worksite and to dispense the mixed slurry of cement by means of an elongate, rigid, upwardly opening U-shaped metal chute having a receiver end related to the discharge end of the mixing drum of the transit mixer truck and a discharge end which is adapted to be arranged above the form or the like on to or into which the slurry is to be deposited.

The receiver end of the ordinary dispensing or discharge chute related to transit mixer trucks is mounted adjacent the mixer drum and is such that it can be swung or pivoted in a horizontal plane as circumstances require. Further, the ordinary duct is mounted so as to provide for vertical adjustment of the discharge end of the chute.

While dispensing chutes of the character referred to have proven to be reasonably satisfactory in a majority of situations, they are extremely inconvenient and difficult to use in numerous situations. Great difficulty is experienced in the use of such chutes in situations where the slurry is deposited in a narrow form or a form of small dimensions and/or irregular shape. Further, such chutes are often difficult and inconvenient to handle when the slurry must be deposited into wheelbarrows or other similar small transporting vessels where exact and careful positioning of the vessels beneath the discharge end of the chute is imperative, but extremely inconvenient and uncertain in practice.

The above noted shortcomings in the ordinary delivery or discharge chute employed in connection with transit mixer trucks is due to the inflexibility of such ducts and their great weight and bulkiness, especially when filled or conducting a slurry of cement.

An object of the present invention is to provide a novel attachment for the discharge end of a discharge or delivery chute of the character referred to which is such that a cement slurry can be easily, conveniently and accurately directed into a small area or such that a slurry of cement can be more accurately and conveniently distributed over a predetermined area of considerable extent.

It is an object of my invention to provide an attachment of the character referred to which consists of a funnel-like receiver engageable on the discharge end of a delivery chute and which is provided with an elongate, flexible, slurry directing flow tube, which tube depends from the receiver.

Still another object of the present invention is to provide an attachment of the general character referred to including novel, manually operable means for moving or shifting the lower discharge end of the flow tube whereby a slurry of cement flowing through and from the attachment can be advantageously directed.

It is another object of the present invention to provide a structure of the general character referred to which is such that the lower end of the flow tube can be advantageously elevated to clear obstructions or the upper edge or rim of a form or vessel, without the necessity of elevating or otherwise manipulating the chute to which the attachment is related.

A further object of my invention is to provide an attachment of the character referred to which is such that the flow tube can be advantageously flexed so as to restrict and/or pinch off the flow of cement therethrough, when circumstances require.

Another object of this invention is to provide novel means for releasably securing the attachment to a conventional delivery chute construction.

Still further, it is an object of this invention to provide an attachment of the character referred to which is easy and economical to manufacture, easy to install and maintain and an attachment which is highly effective and dependable in operation.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawings, in which:

FIGURE 1 is an elevational view of a typical transit mixer truck with the attachment provided by the present invention related thereto;

FIGURE 2 is a sectional view of my new attachment, showing it applied to the discharge end of a typical delivery chute;

FIGURE 3 is a view taken substantially as indicated by line 3—3 on FIGURE 2;

FIGURE 4 is a view taken substantially as indicated by line 4—4 on FIGURE 2; and

FIGURE 5 is an elevational view of a portion of the construction that I provide.

The ordinary transit mixer truck such as is illustrated generally, in FIGURE 1 of the drawings, comprises a mixing drum D rotatably supported on a truck T. An elongate upwardly opening C-shape delivery chute C, made up of one or more rigid sheet metal sections and having an inlet or receiver end **10** and a discharge end **11** is provided to receive a slurry of cement discharge from the drum and to conduct said slurry of cement to a point or station spaced away from the truck, where it is discharged. The inner receiver end **10** of the chute C is suitably pivotally supported adjacent the discharge end **12** of the transit mixer drum D so as to receive the cement slurry issuing from the drum and also to allow for desired swinging and/or pivoting of the chute to facilitate positioning the discharge end of the chute above or adjacent that point or station where it is desired that the cement be deposited.

The structure set forth above, in general terms, is standard or conventional and is familiar and well known to those skilled in the art. Accordingly, further detailed explanation or discussion of the transit mixer truck is unnecessary and will be dispensed with.

The discharge chute C is a simple, upwardly opening, U-shaped section formed of sheet metal. The chute has a rounded bottom **15** and vertical sides **16**. The discharge end **12** of the chute is open and in accordance with common practice, is provided with an outwardly projecting flange **16**, spaced a short distance from the terminal end of the chute. The flange serves to reinforce the chute and also establishes a stop and anchoring means to facilitate releasably securing another section of chute thereto, if circumstances require. The flange **16** is established of a length of angle iron, bent to embrace the exterior of the chute and fixed thereto as by welding *w*.

The attachment A that I provide includes generally, a receiver R engageable on the discharge end **12** of the chute C, a flow tube F carried by the receiver R, manually operable operating means O for directing the tube F and releasable coupling means M for securing the attachment to the chute.

The receiver R is a simple funnel-like member formed of sheet metal. The receiver R has a lower, upwardly and downwardly opening angular sleeve portion **20** and

an upwardly and laterally opening shield portion 21. The shield portion 21 is formed intricately with and projects upwardly from the angular sleeve portion 20 and is preferably upwardly and outwardly inclined.

The open rear side of the shield portion is defined by a U-shaped frame 22 formed of angle iron and has an axially rearwardly projecting flange 23, which flange is adapted to slideably engage about the exterior of the discharge end of the chute C and to engage and stop against the flange 16 on the chute. The other flange 24 of the angle iron frame 22 projects radially outwardly and establshes a mounting structure to which the shield and a portion of the sleeve of the receiver are fixed, as by welding W.

In practice, since the chute C is normally downwardly and outwardly inclined and it is desired that the central vertical axis of the attachment be normal or vertical, the open rear side and the frame 22 are pitched or inclined upwardly and forwardly, as clearly illustrated in FIGURE 2 of the drawings.

The angle of inclination can be varied as desired, however, an angle between 20 degrees and 30 degrees meets most requirements.

The flow tube F is a simple elongate flexible, thin-walled, sock or tube. In practice, the tube can be established of rubber, rubberized fabric or of a plasticized fabric. The tube is vertically disposed and has its upper open end 30 slidably engaged about the lower portion of the sleeve 20 of the receiver R and is fixed thereto by means of a clamping band, or, as illustrated, by means of a plurality of circumferentially spaced fasteners, such as rivets 31.

The tube is of sufficient longitudinal extent or length to allow for swinging the lower end 32 thereof to that extent necessary to attain the desired control over the direction of flow.

The lower end 32 of the tube is provided with a metal reinforcing and/or supporting ring 33, which ring serves to hold the lower end of the tube open and serves to wait the lower end of the tube so that the tube will not collapse when brought into engagement with an obstruction and will not be easily displaced when brought into contact with an obstruction.

The ring 33 can be secured to the lower end of the tube by means of a clamping band or, as illustrated, by means of a plurality of circumferentially spaced fasteners, such as rivets 34.

The manual operating means O that I provide includes a bearing block 40 supported centrally in the sleeve portion of the receiver R by means of a spider 41.

The block 40 is provided with a central downwardly and outwardly divergent rod receiving opening 42 and a central upwardly opening spherical bearing receiving socket 43.

The means O further includes an elongate, normally vertically disposed operating rod extending freely through the opening in the block and provided with a spherical bearing 44 intermediate its ends, which bearing is seated in the socket 43. The upper portion 45 of the rod projects upwardly from the bearing 44 and freely from the open top of the receiver R. The upper terminal end of the upper portion 45 of the rod is provided with a manually engageable handle 46. The lower portion 47 of the rod, extending downwardly from the bearing 44, through the block 40 and the tube F is provided at its lower end with a laterally downwardly and outwardly turned end portion 48 which engages and is fixed to the ring 33, as clearly illustrated in the drawings.

With the means O illustrated and described above, it will be apparent that by engaging the handle 46 and urging it laterally, the bearing 44 and the rod can be shifted universally and the lower end 32 of the tube can be shifted and directed in any desired direction (as illustrated in phantom lines in FIGURE 2 of the drawings).

It will also be apparent that, if desired, the handle can be gripped and lifted in such a manner as to elevate the lower end 32 of the tube, in which case, the bearing 40 is shifted out of engagement in the socket 43.

Still further, it will be apparent that upon lifting the lower end of the tube, in the manner set forth above, and at the same time turning the handle, the tube can be conveniently twisted so as to restrict or shut off the flow of material therethrough.

The coupling means M that I provide includes a rearwardly and downwardly turned strap iron hook 50 at the upper ends of the frame 22, which hooks establish hooked engagement over the upper ends of the flanges 16 on the chute C and prevent the upper portion of the receiver from shifting away from the discharge end of the chute.

The hooks 50 are secured to the flanges 24 of the frame 22 as by welding.

The means M further includes a suitable latch 55 at the lower end of the receiver frame 22, which latch engages the bottom portion of the flange 76 on the chute and prevents the lower portion of the receiver from swinging away from and out of engagement with the discharge end of the chute.

In the case illustrated, the latch 55 is shown as involving a mounting bracket 56 fixed to and depending from the bottom of the frame, a shaft 57 rotatably carried by the bracket, a latch fixed to one end of the shaft and having a laterally projecting finger portion 58 to engage the rear side of the flange 16 on the chute and a laterally projecting handle portion 59 engageable by one's hand to rotate the shaft and finger so as to shift the finger into and out of engagement with the flange 16. The latch 55 further includes spring means 60 to normally yielding urge the finger portion into tight pressure engagement with the flange 16 and to prevent accidental rotation and disengagement of said finger portion from the flange.

It is to be understood that in practice, the latch 55 can be of any suitable design and construction and that the particular latch shown and described above is for the purpose of illustration only.

It is to be further understood that in practice, the frame 22 of the receiver R can be altered or varied in form and construction so as to cooperate with other forms of delivery chute constructions and that other kinds and/or types of coupling means can be employed to secure the receiver to the chute with which it is related, without departing from the spirit of this invention.

Further, if desired and practical, the frame could be eliminated and the receiver R could be fixed directly to the discharge end of a delivery duct.

While I have illustrated my attachment applied to the discharge end of a delivery duct provided to conduct a slurry of cement, it will be apparent that the attachment could be advantageously employed in connection with ducts provided to handle other fluid materials, such as grain and the like.

Having described only a typical preferred form and application of my invention, I do not wish to be limited to the specific details herein set forth, but wish to reserve to myself any modifications and/or variations that may appear to those skilled in the art and which fall within the scope of the following claims.

Having described my invention I claim:

1. An attachment applicable to the forward discharge end of an elongate rigid material handling duct including, an upwardly and rearwardly opening receiver engageable with the forward open end of the duct, an elongate normally vertically extending flexible flow tube fixed to the receiver to communicate with the interior thereof and to depend therefrom and operating means operable to swing and shift the lower end of the tube laterally relative to the receiver and including universal mounting means arranged and supported centrally in the receiver, an elongate operating rod extending longitudinally through the tube and the receiver and pivotally supported by the

mounting means intermediate its ends, said operating rod having a lower end fixed to the lower end of the tube and having a manually engageable handle at its upper end and accessible above the open top of the receiver.

2. An attachment applicable to the forward discharge end of an elongate rigid material handling duct including, a receiver having a vertically extending downwardly opening lower sleeve portion and an upwardly and rearwardly opening upper shield portion, coupling means at the open rear side of the shield portion to releasably secure the receiver to the forward end of the duct in communication therewith, an elongate normally vertically disposed flexible flow tube fixed to and depending from the lower end of the sleeve portion in communication therewith and manually engageable operating means to shift the lower end of the tube laterally and vertically relative to the receiver including, an elongate rod fixed to the lower end of the tube and projecting upwardly and freely through the tube and the receiver and having a handle engageable at its upper end, and universal mounting means carried by the receiver and pivotally supporting the rod intermediate its upper and lower ends.

3. A structure as set forth in claim 2 wherein said universal mounting means includes a bearing block having a central rod receiving opening, a spider fixed to and extending between the block and the receiver to support the block substantially centrally within the receiver, and a bearing member on the rod and seated on the bearing block.

4. A structure as set forth in claim 2 wherein said universal mounting means includes a bearing block having a central rod receiving opening and a central upwardly opening bearing socket, a spider fixed to and extending between the block and the receiver to support the block substantially centrally within the receiver, and a bearing member on the rod and seated in the socket.

5. A structure as set forth in claim 2 wherein said universal mounting means includes a bearing block having a central downwardly and outwardly divergent rod receiving opening, a central upwardly opening spherical socket, a spider fixed to and extending between the block and the receiver to support the block substantially centrally within the receiver, and a bearing member having a spherical surface engaged and seated in the socket.

6. A structure as set forth in claim 2 wherein said coupling means includes an outwardly projecting stop flange on the chute and spaced from the discharge end thereof, a frame about the open rear side of the receiver shield and having a rearwardly projecting flange slideably engaged about the discharge end of the chute and stopped against the flange on the chute, rearwardly and downwardly projecting hooks at the upper portion of the frame and engaged over and establishing hooked engagement with the upper portions of the stop flange, and a manually operable latch at the lower portion of the frame and releasably engaging the lower portion of the stop flange.

7. An attachment applicable to the forward discharge end of an elongate rigid material handling duct including, a receiver having a vertically extending downwardly opening lower sleeve portion and an upwardly and rearwardly opening upper shield portion, coupling means at the open rear side of the shield portion to releasably secure the receiver to the forward end of the duct in communication therewith, an elongate normally vertically disposed flexible tubular flow tube fixed to and depending from the lower end of the sleeve portion of the receiver in communication therewith, a rigid angular reinforcing ring fixed to the lower end of the tube to hold the tube open, and manually engageable operating means to shift the lower end of the tube laterally and vertically relative to the receiver including, a rod fixed to the ring and projecting freely upwardly through the tube and receiver and provided with a handle at its upper free end, and universal mounting means carried by the receiver and slideably and pivotally supporting the rod intermediate its upper and lower ends.

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