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COMBINED DELIVERY TUBE NOZZLE AND VALVE

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The invention relates to a combined delivery tube nozzle and valve principally intended for handling granular materials from a storage bin, more especially dry sand from storage to diesel, steam or electric locomotives.

The invention is in the nature of an improvement on the combined nozzle and valve disclosed in an application filed May 16, 1947, by Max W. Powell, Serial No. 748,464, now Patent No. 2,566,248, dated August 28, 1951, and it will be understood that the present device is primarily intended for use in an assembly such as is disclosed in Fig. 1 of that application, as a substitute for the combined delivery tube and nozzle thereof, wherein the said combined delivery tube and nozzle and valve is shown as connected with the lower end of a flexible tube or conduit communicating at its upper end with a sand supply tank or bin, and is adapted to automatically open to discharge sand into a locomotive sand box by reason of contact between a portion of the device and the wall of the sand box, and is adapted to automatically close as soon as the nozzle is removed from the sand box, thus avoiding wastage and loss of sand, although it will be apparent that the improved nozzle and valve may also be used in other relations without departing from the spirit of the invention in its broadest aspects.

My improved delivery tube nozzle and valve preferably consists of two principal parts, (1) a main body portion comprising a tube adapted to be connected at its upper end to a delivery pipe or spout leading from an elevated storage tank or bin, said tube being equipped with a sealed lower end, a valve seat and a weather shield, and (2) a normally closed gravity acting slide valve fitting over the body portion and equipped with a locking handle and operating horn.

The invention will be more readily understood by reference to the accompanying drawings and the following detailed description, in which is set forth by way of illustration a specific embodiment of the inventive thought.

In the drawings:

Fig. 1 is a side elevation of the combined delivery nozzle and valve, with a portion of a flexible hose shown in dot and dash lines, the valve being shown in closed position.

Fig. 2 is a bottom plan view of the same, showing in dotted lines the handle and horn in the locking position.

Fig. 3 is an axial sectional view on line 3—3 of Fig. 2, but on a larger scale, parts being shown in elevation.

Fig. 4 is a view similar to Fig. 1 but on a smaller scale and showing the valve in open position.

Fig. 5 is an enlarged sectional view on the line 5—5 of Fig. 3 and

Fig. 6 is an enlarged fragmentary section on the line 6—6 of Fig. 3.
front end of the horn member 13. The space between these two forwardly and downwardly inclined ends is sufficient to fit over a portion of an upright wall I, which may be a slide wall of the locomotive sanding box as set forth in application Serial No. 748,464.

In service the operator may raise the device by the main body 1 and insert the nozzle into a receptacle such as the locomotive sanding box disclosed in Patent No. 2,566,246, with the upturned portion of the operating horn 13 resting against the edge of the receptacle, unlock the slide valve B by slight rotation of the handle 15 and push the main body tube forward, thus opening the slide valve. When sufficient material has been delivered from the hose 2 the operator grasps the valve handle 15, pulls back on the main body tube 1 and, assisted by gravity, pushes the slide valve B closed. A slight rotation of the handle 15 locks the valve in closed position.

It will be apparent that the shield 10, including the filler collar 9, serves the function of providing a watertight proof housing for the sleeve valve B, which valve slides freely in the space provided between the body tube 1 and the shield 10, within longitudinal limits provided by the lower end of the collar 9 on the one hand, and the sealing ring 8 on the other, the said collar 9 and shield 10 being so arranged as to allow of sliding from above into the space between the shield 10 and the tube 1 in which the valve B slides, and thus preventing corrosion and sticking of the slide valve B, which valve, owing to its weight and the downward inclination of the hose supported main body tube 1 on which it slides, will normally occupy a closed position when the nozzle is not in use. The notched lower end 12 of the shield or housing 10 in cooperation with the upper end of the horn 13 also provides means for locking the valve in closed position as previously set forth, the lower end of the slide valve being snugly engaged with the compressible sealing ring 5 carried by the tubular body member to insure a sand tight fit.

A specific embodiment of the inventive thought has been described in detail for the purpose of illustration, but it will be obvious that numerous modifications and variations may be resorted to without departing from the spirit of the invention.

I claim:

1. A valved nozzle for delivering granular materials through a tubular conduit from an elevated storage bin to a receptacle on a lower level, comprising a main body including a tube with a closed end, and a valve seat surrounding the closed end, and a valve seat surrounding the closed end, a valve seat surrounding the closed end, said valve seat comprising a main body and movable axially relative thereto to open and closed positions, said slide valve being adapted in one axial position to close the opening in said main body and rest against said seat, and in another axial position being adapted to uncover said opening, said slide valve member having a horn secured thereto adapted to engage the edge of a receptacle to be filled with granular material, and an outer tube secured to and encircling the main body and fitting over said slide valve member, said outer tube having a longitudinal slot to permit passage of said horn and serving as a guide therefor, catching means for said slide valve member for securing the same in closed position, said catching means including a notch adjacent one end of the slot, and a valve handle secured to the horn to effect partial rotation as well as sliding of the slide valve member to move the horn into and out of said notch.

2. A valved nozzle for delivering fluent material through a discharge pipe from an elevated storage tank to a receptacle on a lower level than the tank, said nozzle comprising a tubular body member having an open upper end for attachment to the discharge pipe, and having its lower end closed and being provided with a discharge opening adjacent the closed end, a valve seat surrounding the lower end of said tube, and a sleeve valve member slidable on said tube and normally contacting said valve seat and closing said opening, and valve actuating means secured to said sleeve valve member and projecting laterally therefrom adapted for engagement with an edge of the receptable to be filled for automatically uncovering the discharge opening as the tubular body member is forced downwardly into the receptacle while the sleeve valve member is held stationary.

3. A valved nozzle for delivering fluent material through a discharge pipe from an elevated storage tank to a receptacle on a lower level than the tank, said nozzle comprising a tubular body member having an open upper end for attachment to the discharge pipe, and having its lower end closed and being provided with a discharge opening adjacent the closed end, a valve seat surrounding the lower end of said tube, and a sleeve valve member slidable on said tube and normally contacting said valve seat and closing said opening, and valve actuating means secured to said sleeve valve member and projecting laterally therefrom adapted for engagement with an edge of the receptable to be filled for automatically uncovering the discharge opening as the tubular body member is forced downwardly into the receptacle while the sleeve valve member is held stationary.

4. A valved nozzle for delivering fluent material through a discharge pipe from an elevated storage tank to a receptacle on a lower level than the tank, said nozzle comprising a tubular body member having an open upper end for attachment to the discharge pipe, and having its lower end closed and being provided with a discharge opening adjacent the closed end, a valve seat surrounding the lower end of said tube, and a sleeve valve member slidable on said tube and normally contacting said valve seat and closing said opening, valve actuating means secured to said sleeve valve member and projecting laterally therefrom adapted for engagement with an edge of the receptable to be filled for automatically uncovering the discharge opening as the tubular body member is forced downwardly into the receptacle while the sleeve valve member is held stationary.

5. A valved nozzle for delivering fluent material through a discharge pipe from an elevated storage tank to a receptacle on a lower level than the tank, said nozzle comprising a tubular body member having an open upper end for attachment to the discharge pipe, and having its lower end closed and being provided with a discharge opening adjacent the closed end, a valve seat surrounding the lower end of said tube, and a sleeve
valve member slidable on said tube and normally contacting said valve seat and closing said opening, valve actuating means secured to said valve member and projecting laterally therefrom adapted for engagement with an edge of the receptacle to be filled for automatically uncovering said discharge opening as the tubular body member is forced downwardly into the receptacle while the valve seat member is held stationary, and an external casing fixed to and spaced from said tubular body and surrounding said sleeve valve member casing having a longitudinal guide slot formed therein for said valve actuating means and being closed at its upper end to provide a waterproof housing for said sleeve valve member.

6. A valve nozzle for delivering fluent material through a discharge pipe from an elevated storage tank to a receptacle on a lower level than the tank, said nozzle comprising a tubular body member having an open upper end for attachment to the discharge pipe and having its lower end closed and being provided with a discharge opening adjacent the closed end, a valve seat surrounding the lower end of said tube, and a sleeve valve member slidable on said tube and normally contacting said valve seat and closing said opening, a valve actuating means secured to said sleeve valve member and projecting laterally therefrom adapted for engagement with an edge of the receptacle to be filled for automatically uncovering said discharge opening as the tubular body member is forced downwardly into the receptacle while the valve seat is held stationary, an external casing fixed to and spaced from said tubular body and surrounding said sleeve valve member, said casing having a longitudinal guide slot formed therein for said sleeve valve actuating means, and means for latching the sleeve valve member in closed position.

7. A valve nozzle for delivering granular materials through a tubular conduit from an elevated storage bin to a receptacle on a lower level, comprising a main body including a tube with a closed end, and a valve seat surrounding the closed end, said tube having an opening adjacent the closed end, a slide valve member fitting over the tubular portion of the main body and movable axially relative thereto to open and closed positions, said slide valve member being adapted in one axial position to close the opening in said main body and rest against said seat, and in another axial position being adapted to uncover said opening, said slide valve member having a horn secured thereto adapted to engage the edge of a receptacle to be filled with granular material, and said tubular member having an outer tube secured in spaced relation thereto and fitting over said slide valve member, said outer tube having a slot to permit passage of said horn and serving as a guide therefor, and latching means on said slide valve member and engageable with said slot for securing the slide valve member in closed position.

8. A valve nozzle for delivering granular materials through a tubular conduit from an elevated storage bin to a receptacle on a lower level, comprising a tubular main body having a closed lower end, an open upper end for attachment to the conduit, a tubular slide valve member fitting said tube and movable axially relative thereto to open and closed positions, a slide valve member being adapted to slide by gravity to the closed end to uncover said opening, and a projection carried by said slide valve member for effecting sliding movement thereof away from said seat to uncover said opening.

9. A valve nozzle for delivering fluent material by gravity flow through a tubular conduit from an elevated storage tank to a receptacle on a lower level, said nozzle comprising a tube with a closed lower end and having an open upper end for attachment to the tubular conduit, a valve seat surrounding the closed end, said tube having an opening adjacent the closed end, and a slide valve member fitting said tube and movable axially relative thereto to open and closed positions, said slide valve member being adapted to slide by gravity toward said seat to close said opening, and a projection carried by said slide valve member for effecting sliding movement thereof away from the seat to uncover said opening.

10. A valve nozzle for delivering fluent material by gravity flow through a tubular conduit from an elevated storage tank to a receptacle on a lower level, said nozzle comprising a tube with a closed lower end and having an open upper end for attachment to the conduit, a valve seat surrounding the closed end, said tube having an opening adjacent the closed end, a slide valve member fitting said tube and movable axially relative thereto to open and closed positions, said slide valve being adapted to slide by gravity toward the valve seat to close said opening, a projection carried by said valve member for effecting sliding movement thereof away from said seat to uncover said opening, and means for locking said slide valve member in closed position.

11. A valve nozzle for delivering fluent material through a tubular conduit from an elevated storage tank to a receptacle on a lower level, comprising a tubular body member having a closed lower end, and having an open upper end for attachment to the conduit, and having a lower opening adjacent the closed end, a slide valve member fitting said tubular body member and movable axially relative thereto to open and closed position, said slide member being adapted to slide by gravity toward the closed end to cover said opening, an external casing fixed to and spaced from said tubular body and surrounding said slide valve member and having a longitudinal slot therein, and an actuating member carried by said slide valve and projecting through the slot in said outer casing and serving to move the slide member away from the closed end to uncover the opening.

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