

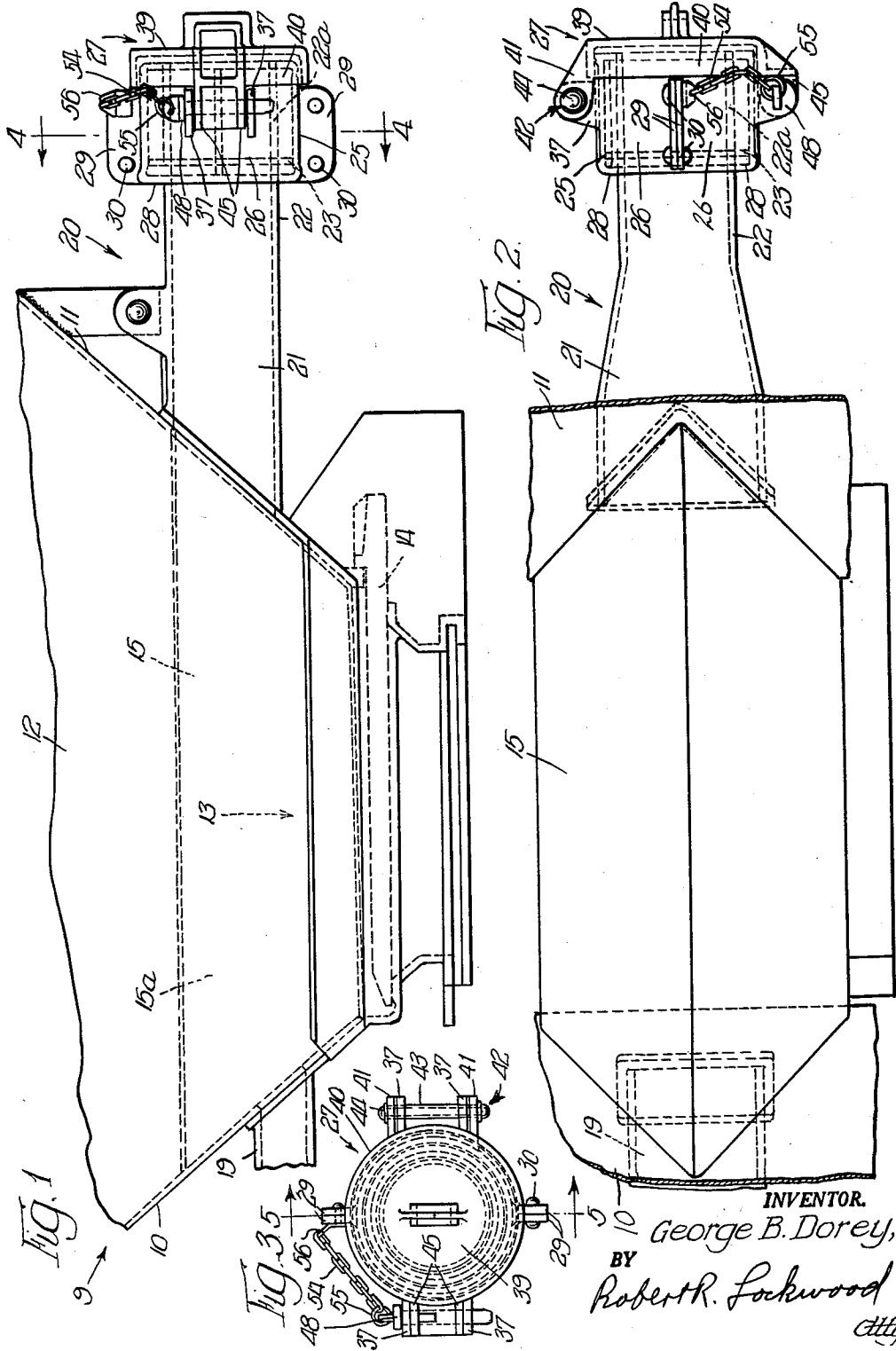
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G. B. DOREY
CLOSURE MEANS

3,079,032

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2 Sheets-Sheet 1



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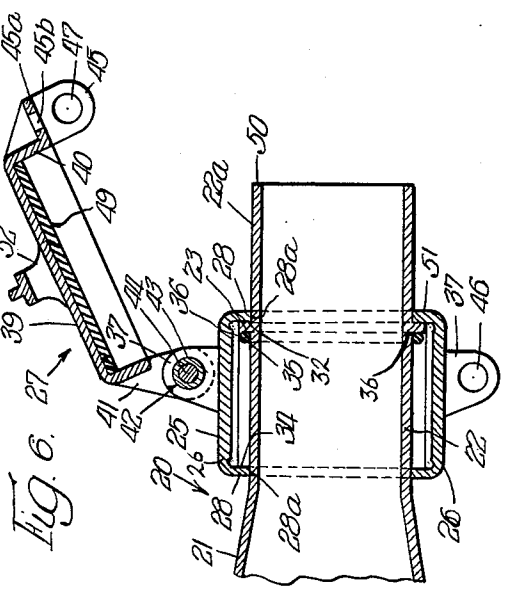
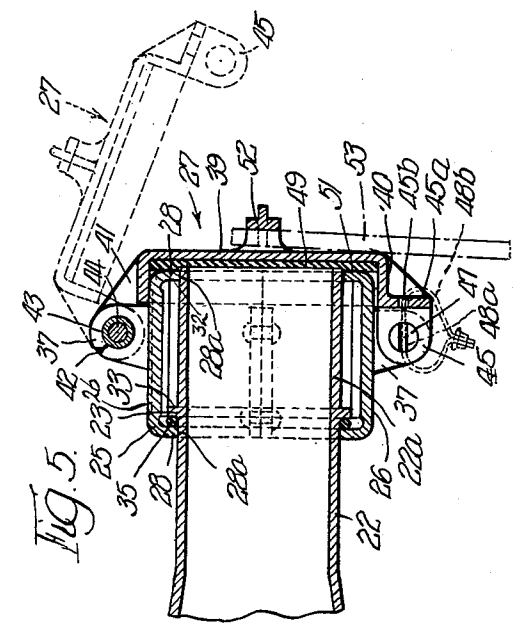
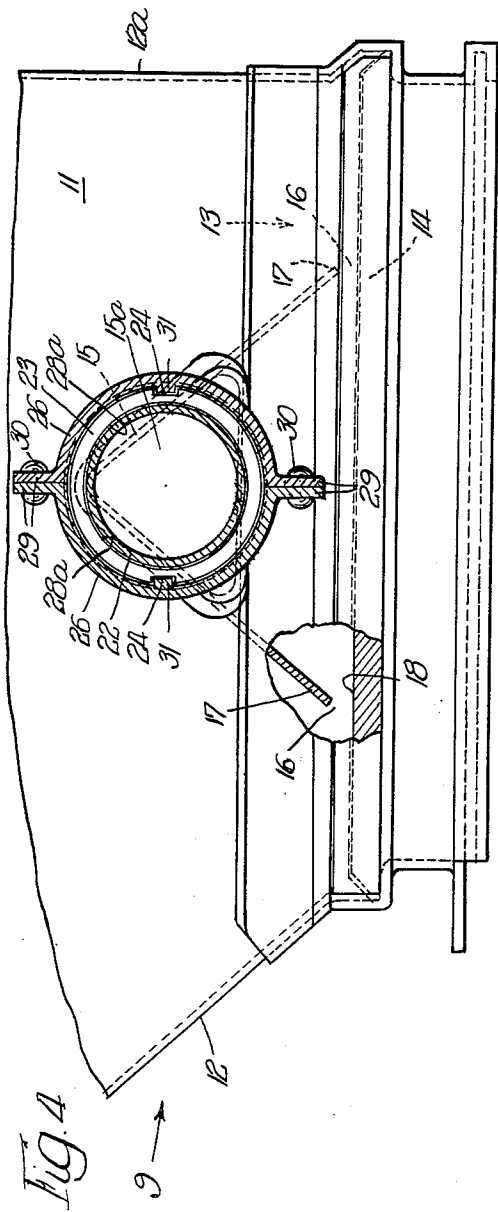
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CLOSURE MEANS

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1 Claim. (Cl. 220—38)

This invention relates to an improved type of nozzle closure for a pneumatic conduit and the like and is of special importance in connection with transportable containers, such as railway cars.

The objects of the invention, among others, are: To provide a closure which will completely enclose the nozzle section of a conduit and exclude contaminating matter; to provide a closure which is axially movable in a direction inwardly away from the mouth of a nozzle to permit application of a suction hose on the nozzle end; to provide an axially movable closure having an end cap pivotally carried thereby and swingable to embrace the closure and thereby provide a canister like enclosure; to provide limiting stops for an axially movable closure; to provide interengaging spline and slot means for maintaining an axially movable closure against annular displacement; to provide suitable gasket and clamping means for retaining the closure in operative sealing position; and to provide socket means for receiving a lever to force the parts into tight sealing relation.

The invention also resides in certain details of parts associated with the construction such as described and claimed.

For further comprehension of the invention reference may be had to the accompanying drawings wherein the improvement is shown as applied to the nozzle end of a pneumatic conduit, such as employed in a railway hopper car of the type shown, for example, in application Serial No. 783,749 filed December 30, 1958, and assigned to the assignee of this application.

In said drawings, FIG. 1 is a vertical longitudinal elevational view of the lower portion of a hopper showing a conventional type of pneumatic outlet with the improved closure applied thereto.

FIG. 2 is a plan view of the central part of the structure associated with the conduit and the closure therefor, and with the side hopper floor sheets eliminated.

FIG. 3 is an end elevational view of the nozzle closure assembly shown in FIG. 1, as viewed from right to left, with certain parts omitted to better illustrate the structure.

FIG. 4 is a vertical transverse sectional view taken through the closure and on a line 4—4 of FIG. 1.

FIG. 5 is a horizontal sectional view of the closure assembly as seen on a line 5—5 of FIG. 3.

FIG. 6 is a view, similar to FIG. 5, except that the closure is shown in fully retracted position with the nozzle in readiness for receiving a suction hose.

In the drawings the improved nozzle structure has been shown as applied to a conventional type of hopper outlet for a hopper car wherein a central hood member in combination with a flat sliding door forms a vacuum chamber having an outlet conduit for pneumatic withdrawal of lading.

The hopper is indicated, generally, at 9 and is formed by oppositely sloping floors 10 and 11 which meet with other walls, shown at 12 and 12a, to form a four sided outlet. It has a discharge opening 13 and a sliding gate 14 for controlling gravity discharge of lading from the hopper 9. A longitudinally extending hood member 15 extends through the hopper 9 and, in cooperation with the gate 14, forms a vacuum chamber 15a in which lading enters through openings 16 disposed between the eaves 17 of the hood member 15 and the upper surface 18 of the

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gate as best indicated by the cutaway section of FIG. 4. An air inlet conduit, indicated conventionally at 19, allows the entry of air into the vacuum chamber 15a.

At the opposite end of the vacuum chamber 15a there is an exit conduit 20 which has a body section 21 of generally triangular shape which is secured to and extends beyond the sloping hopper floor 11. The body section 21 merges into a substantially circular section 22. The section 22, midway of its length, is provided with a flange 23 having notches 24—24 formed therein as best seen in FIG. 4. The part of circular section 22 outwardly of the flange 23 designated by the reference character 22a constitutes a nozzle for connection with a suction hose (not shown). It is essential that this hose receiving end or nozzle 22a be adequately protected against contamination. To this end the present invention contemplates the use of an axially movable closure member 25 as will be described.

The closure member 25 is preferably formed by a pair of segmental parts 26—26 which are united to form an annular assembly. It is provided at the outer end with a swinging cap 27. The interior diameter of the annular closure member 25, as formed by the assembly of the segmental parts 26—26, is such as to embrace the flange 23. At the ends of the member 26 there are radially inwardly extending walls 28—28 which have their edge portions 28a concentrically formed with the circular section 22 to present bearing surfaces riding on the outer surface of the ends of the cylindrical conduit 22 in the manner of sleeves.

For uniting the respective parts 26—26 there are provided flanges 29 which extend laterally from each side and they are secured together by rivets 30—30. Spline like tongues 31 extend radially inwardly and centrally lengthwise on the inside of the segmental parts 26 and have sliding engagement within the notches 24 of the flange 23 thereby maintaining the closure member 25 against annular displacement. The interior face 32 of the right hand end wall 28 constitutes a stop which engages with side face 33 of the flange 23 to limit axial movement of the closure member 25 in an opening direction. The interior face 34 of the left hand end wall 28 likewise constitutes a stop to limit movement of the closure 25 in a closing direction but in this case a resilient O ring 35 is preferably interposed between said face 34 and the side face 36 of the flange 23.

As shown in FIGS. 1 and 2 spaced lugs 37—37 extend laterally from the outer sides of the segmental elements 26—26 for the purpose of pivotally supporting one side of the swinging cap 27 and maintaining the opposite side in tight sealing position. The cap 27 is preferably in the form of a dish plate having a flat body portion 39 and a continuous annular flange 40 of appreciable depth. The cap 27 is provided on one side with hinge butts 41—41 which straddle a pair of the lugs 37 and they accommodate a hinge pivot 42 whereby the cap 27 is mounted for swinging movement. The hinge pivot 42 is preferably in the form of a ferrule 43 held in position by a rivet 44.

The side of the cap 27 opposite to the hinge pivot 42 is provided with bracket lugs 45—45 which, when the cap 27 is in closed position, extend between the adjacent pair of lugs 37—37. The lugs 37—37 and the lugs 45—45 are provided with apertures 46 and 47 which are brought into aligned relation when the cap 27 is closed as shown in FIG. 1. A sealing pin 48 extends through the aligned apertures 46 and 47 and thus retains the cap 27 in fully closed position. Sealing apertures are provided, as shown in FIG. 5, in the pin 48 and wall 45a between lugs 45 as indicated at 48a and 48b respectively for receiving a sealing ribbon therethrough as indicated conventionally by dot and dash lines at 48b.

A resilient gasket 49 is fitted on the inner face of the cap 27 for engagement with the end face 50 of the nozzle

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22a and the exterior face 51 of the adjacent end wall 28. Upon closing movement of the end cap 27, the resilient gasket 49 and resilient O ring 35 are compressed. Thus the various parts are maintained under tension by the pin 48. In order to provide the necessary leverage for compression of the gaskets 35 and 49, a socket 52 is disposed centrally of the cap 27 for accommodating a removable bar as indicated conventionally by dot and dash lines at 53.

The pin 48 is preferably loosely connected to an anchoring chain 54. It is connected at one end, as at 55, to the pin 48 and at the opposite end to the closure member 25, as at 56.

What is claimed as new is:

In combination,

- (a) a conduit including a nozzle section for receiving a suction tube, 15
- (b) said nozzle section having a smooth cylindrical exterior surface of considerable length as compared to its internal diameter,
- (c) a flange extending radially outwardly from said conduit at the base of said nozzle section, 20
- (d) a sleeve axially slidable over said conduit of a length to overlie said nozzle section and having radially inwardly extending flange walls at its ends cooperating with said flange to limit movement of said sleeve in opposite directions, 25

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- (e) a resilient O ring gasket interposed between said flange and the flange wall adjacent thereto when said sleeve overlies said nozzle section to provide a tight seal therebetween,
- (f) interengaging slot and spline means between the last mentioned flange wall and said flange preventing annular displacement of said sleeve on said conduit,
- (g) and a cap pivotally mounted on one side of said sleeve to swing thereacross when it overlies said nozzle section and engage with the opposite side of said sleeve and thereby form a complete enclosure for said nozzle section.

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