

Feb. 26, 1935.

J. A. JENSEN

1,992,750

ROTARY FLUID CONDUCTING MEANS

Filed Sept. 9, 1933

3 Sheets-Sheet 1

FIG. I.

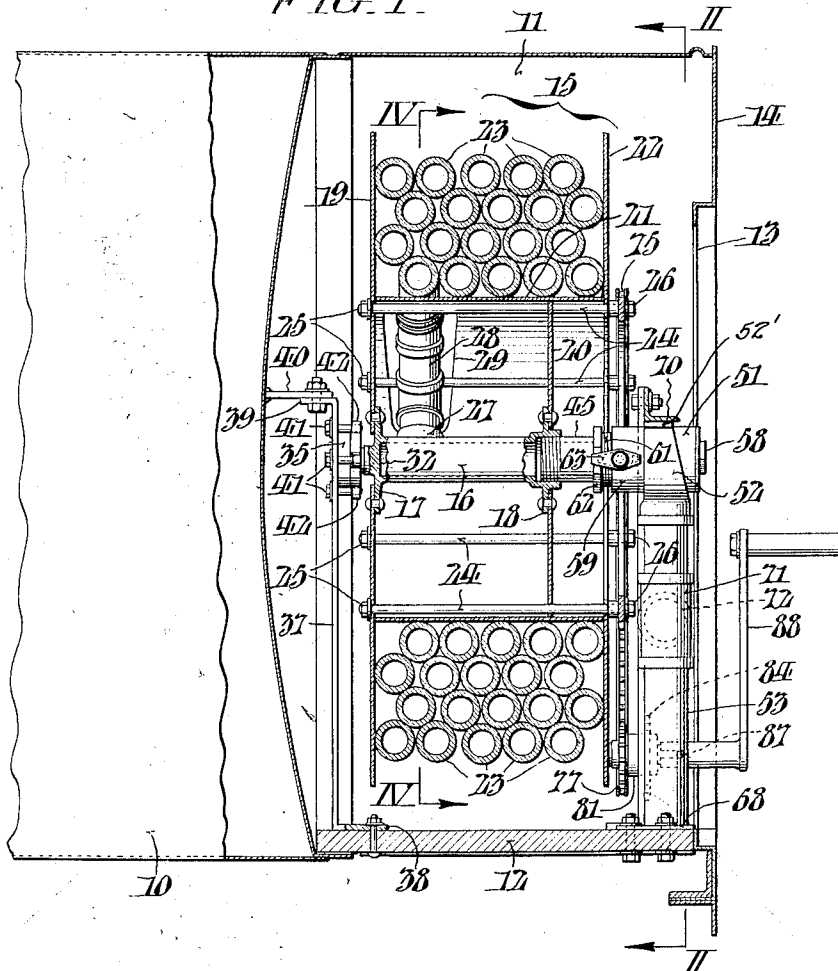
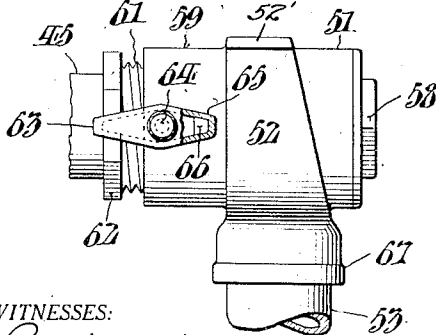


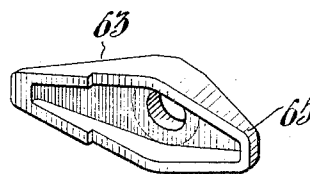
FIG. VI.



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FIG. VII.



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3 Sheets-Sheet 2

FIG. II

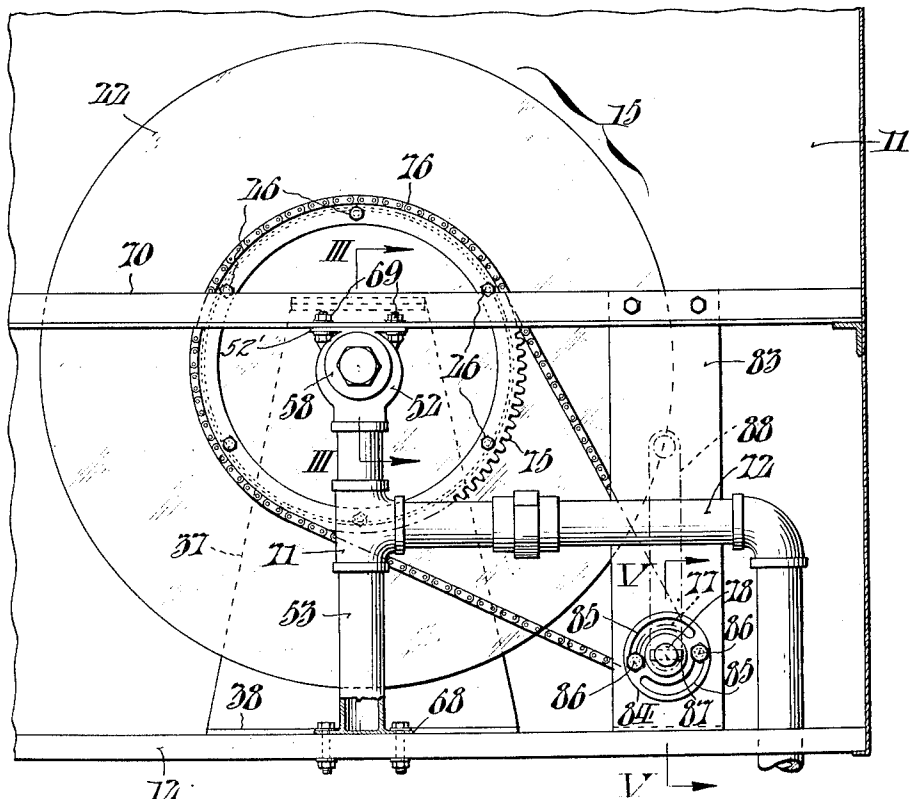
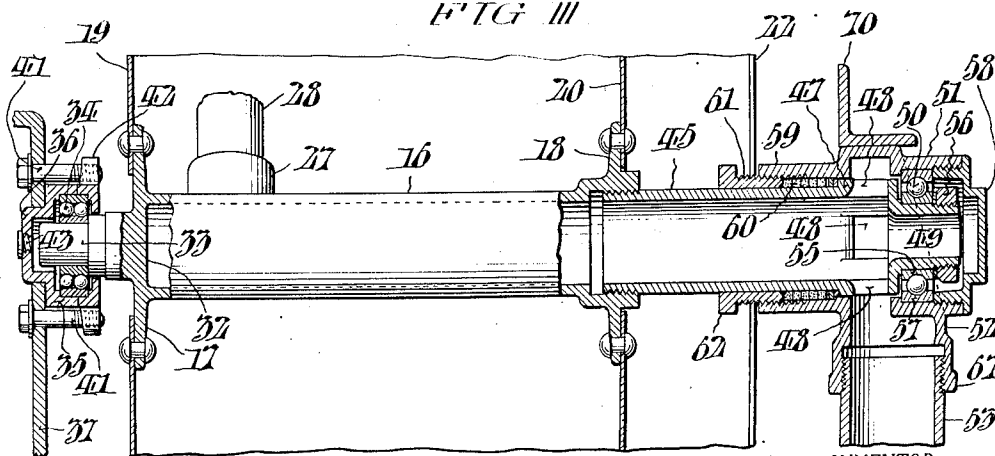


FIG. III



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3 Sheets-Sheet 3

FIG. IV

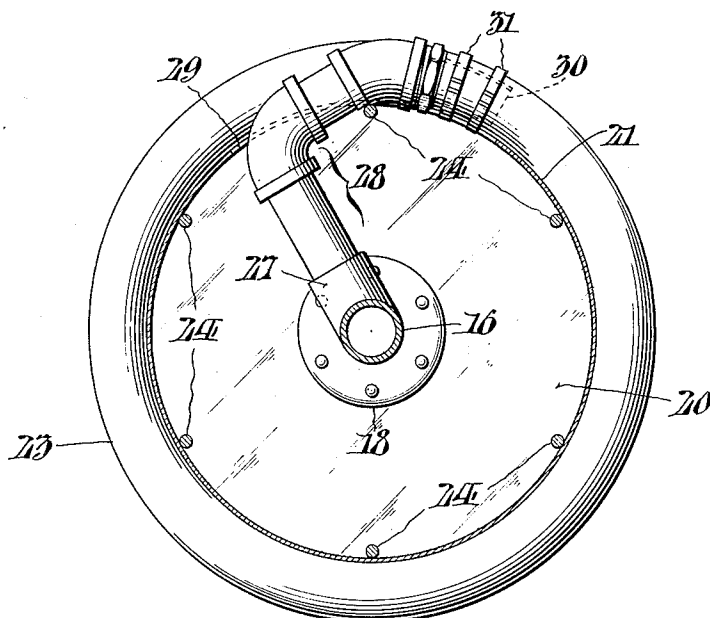
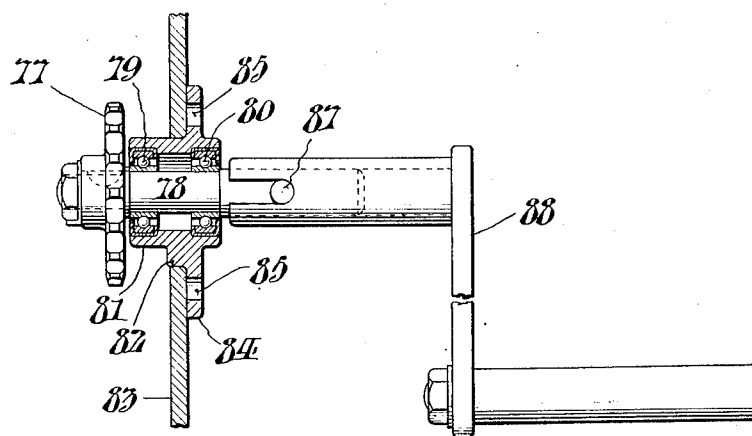


FIG. V



WITNESSES:

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UNITED STATES PATENT OFFICE

1,992,750

ROTARY FLUID CONDUCTING MEANS

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Application September 9, 1933, Serial No. 688,797

5 Claims. (Cl. 285—184)

This invention relates to rotary fluid conducting means, that is to say: to spindles and the like designed for passage of fluids through them.

While my invention is adaptable to many other uses, it is particularly advantageous in connection with hose reels for tank vehicles of the kind ordinarily employed in the delivery of gasoline, oils and other fluid commodities, and I have accordingly so exemplified it both in the drawings and in the detailed description which follows.

The primary aim of my invention is to provide in a means of the character referred to a simple, compact, reliable leak-proof and long wearing joint between the rotary fluid conducting element, such as the tubular spindle of a hose reel for tank vehicles, and a communicating tubular standard or flow conducting support in communication with the source of fluid supply, which standard incorporates a self-lubricating bearing capable of taking both the lateral and the end thrust of the spindle.

A further aim of my invention is to provide a simple form of locking means which will insure against accidental rotation of the gland of a stuffing box incorporated in a spindle bearing joint thereby to prevent fluid leakage between the rotating and stationary parts.

Other objects and attendant advantages of this invention will become apparent from the detailed description hereinafter.

In the drawings, Fig. I is a fragmentary view partly in side elevation and partly in longitudinal section of a tank vehicle fitted with a hose reel structure embodying the present invention.

Fig. II is a cross sectional view taken as indicated by the arrows II—II in Fig. I.

Fig. III is a fragmentary detail view, on a larger scale, taken as indicated by the arrows III—III in Fig. II and showing the reel in axial section.

Fig. IV is a cross section of the reel taken as indicated by the arrows IV—IV in Fig. I.

Fig. V is a detail cross section taken as indicated by the arrows V—V in Fig. II.

Fig. VI is a fragmentary view showing the outer bearing of the reel in side elevation; and,

Fig. VII is a perspective view of an element included in the locking means which prevents loosening of the packing gland of the bearing joint for the reel incident to turning of the latter.

With reference first more particularly to Fig. I of these illustrations, I have shown in part at 10, the body of a tank vehicle such as is commonly employed in delivering gasoline, oils and other commodities in liquid form. Appended to the

rear end of the tank body 10 is a utility compartment 11 with a wooden floor 12, and with an access opening 13 in its back wall 14.

The hose reel in which the present invention is embodied is designated comprehensively by the numeral 15 and shown in Fig. II as occupying the right hand side of the utility compartment 11. From Figs. I and III it will be observed that the reel 15 comprises a hollow tubular spindle 16, which, adjacent its opposite ends is formed with circumferential flanges 17 and 18. To the flange 17 is riveted the discous inner end head 19 of the reel 15, and to the other flange 18 is similarly secured a circular diaphragm 20 which is peripherally welded to the inside of a tubular drum component 21 of the reel 15 and thus serves to maintain the latter in exact axial relation to the spindle 16. The right hand end head 22 of the reel 15 forms in conjunction with the drum component 21 and the opposite head 19 a circumferential channel within which are confined the superposed convolutions of the hose 23 wound on said reel, the several reel parts being rigidly united by a number of circumferentially-arranged longitudinal stay rods 24 with clamp nuts 25, 26, on their opposite ends. Immediately inward of its flange 17, the spindle 16 has a radial boss 27 for a pipe connection 28 which reaches through an opening 29 in the drum component 21 of the reel 15 and which terminates at the outer surface of said drum component in a nipple 30 whereto the hose 23 is connected by a couple of clamp bands 31, see Figs. I and IV.

From Fig. III it will be noted that the spindle 16 is closed at its inner end as at 32 and there formed with a projecting shouldered trunnion 33 which is supported for free rotation in a self-aligning ball bearing 34. This ball bearing 34 is housed within a split casing 35 having an axial boss 36 which fits within an opening in a standard 37 fashioned from stout sheet metal. At its bottom, the supporting standard 37 has a foot flange 38 (Fig. I) which is bolted to the floor 12 of the utility compartment 11, and at its top it has a lateral flange 39 which is bolted to a bracket piece 40 on the back wall of the tank 10. A number of clamp bolts 41 (Fig. III) passing through the standard 37 and engaging radial lugs 42 of the ball bearing casing 35 serve as a means to hold the two casing parts assembled and also to secure the casing 35 to said standard. The ball bearing 34 is lubricated by grease introduced into the hollow of the casing 35 through an axial screw plug opening 43 in the boss 36 of said casing.

Still referring to Fig. III, the spindle 16 has a

supplemental extension 45, which, at its outer end is formed with a cylindric head 47 having a number of radial inlet ports 48, and also with a diametrically reduced hollow tip portion 49.

5 This tip 49 is designed to serve as the outer trunnion for the reel 16; it being rotatively supported by a relatively large deep groove ball bearing 50. As shown, the ball bearing 50 is housed in a laterally offset boss 51 of a special hollow elbow fitting 52 at the top of a pipe standard 53 which latter reaches up from the floor 12 of the utility compartment 11 at the back end of the latter, see Figs. I and II. The inner ring 55 of the ball bearing 50 is secured by a clamp nut 56 thread-
10 edly engaging the trunnion 49; while the outer ring 57 of said bearing is clamped between a shoulder within the bearing cavity of the elbow fitting 52 and a screw cap 58 which closes the open end of said cavity.

15 The horizontal extremity 59 of the elbow fitting 52 has a bore equal to the diameter of the head 48 of the spindle extension tube 45 and which surrounds a considerable portion of said tube with provision of a circumferential interspace for
20 packing 60 which is compressible by a screw gland 61 having a polygonal head 62 for the application of a tightening wrench. After the packing gland 61 has been drawn up it is locked against rotation by a means shown in Figs. VI and VII as
25 having the form of a hollow finger 63 which is secured to the side of the elbow fitting 52 by a bolt 64 and which is adapted to lap over one of the flat edges of the gland head 62. The finger 63 is prevented from turning about the at-
30 taching bolt 64 by virtue of the engagement of its tail 65 over a lug 66 on the side of the elbow fitting 52 immediately adjacent the hole for said bolt. The pipe standard 53 screws into the downward extremity 67 of the elbow fitting 52, and
35 said standard is closed at its bottom end and there formed with a foot flange 68 which is bolted to the floor 12 of the utility compartment 11, see Figs. I, II and III. In order to insure absolute rigidity in the pipe standard 53, the elbow
40 fitting 52 at its top embodies an apertured flange 52' whereby it is secured by bolts 69 to an angle iron beam 70 extending transversely of the utility compartment 11. Interposed in the pipe stand-
45 ard 53 is a T 71 whereinto connects a branch pipe 72 that leads to the main drain pipe (not shown) of the tank 10.

For turning the reel 15 to wind up the hose 23 provisions are made as follows: Secured to the outer side of the drum head 22 of the reel 15
50 (Figs. I and II) by means of the nuts 26 engaging the corresponding ends of the stay rods 24 is a toothed annulus 75 which is coordinated by means of a sprocket chain 76 with a sprocket pinion 77. This sprocket pinion 77 is secured
55 to a shaft 78 (Figs. I, II and V) which is rotatively supported by a pair of spaced ball bearings 79, 80 within a cylindric casing 81. As shown in Figs. I and V, this bearing casing 81 has an eccentric portion 82 which engages an opening in
60 an upright plate 83 secured at its top to the angle beam 70 hereinbefore mentioned and at its bottom to the floor 12 of the utility compartment 13. The bearing casing 81 it will be noted from Figs. II and V is moreover formed with a circumferential flange 84 which has a pair of eccentric
65 slots 85 coaxial with the eccentric portion 82 for passage of attaching bolts 86 which engage in the upright plate 83. By loosening the bolts 86 and turning the bearing casing 81 it will be
70 evident that through cooperation between the

eccentric slots 85 and the bolts 86 that the slack of the sprocket chain 76 may be taken up when required, and the bearing casing 81 afterwards re-set by tightening said bolts. At its outer end the shaft 78 is provided with a crosswise key 87
75 for application of a removable crank handle such as shown at 88 in Figs. I, II and V.

In the use of the reel 15, the liquid is pumped from the tank 10 and conducted to the hose 23 via the pipe connection 72, the tubular supporting standard 53, the special elbow fitting 52 at the top of the latter, the tubular spindle 16, and the pipe connection 28. Incident to the turning of the reel 15 it will be seen that the bearing 50 within the elbow fitting 52 will take, not only the lateral thrust of said reel but also the end thrust occasioned by compression of the packing 60 against the head 47 of the spindle extension 45. The portion of spindle extension 45 rotating within the gland 61 is thus relieved of strains which would be likely to result in rapid wear. By constructing the bearing support for the reel 15 as herein described substantially the entire width of the utility compartment is available for said reel to the advantage that the same can be made much wider than usual and thereby accommodate a correspondingly greater length of hose.

While I have with particularity disclosed my invention herein as embodied in a hose reel, it is obvious that, by modifications within the scope of the appended claims, it can be adapted in other instances where a reliable long-wearing leak-proof joint is essential to rotary fluid conducting means.

Having thus described my invention, I claim:

1. A rotary fluid conducting means comprising an open tubular spindle embodying an enlargement with radial inlet ports near one end, a fitting on a pipe in communication with a source of supply of the fluid and surrounding the spindle enlargement, said fitting including apertured means whereby it is rigidly supportable and also affording a stuffing-box to prevent leakage around the spindle, and a combined end and side thrust bearing within the fitting beyond the enlargement to rotatively support the spindle.

2. A rotary fluid conducting means comprising an open tubular spindle embodying a cylindric head with radial inlet ports near one end, a fitting on a pipe in communication with a source of supply of the fluid and surrounding the cylindric inlet head of the spindle, said fitting including means for its rigid support, and a combined end and side thrust ball-bearing within an offset boss embodied in the fitting to rotatively support the spindle with provision for the circulation of the fluid through and around said ball bearing.

3. A rotary fluid conducting means comprising an open tubular spindle embodying a cylindric head with a number of radial ports near one end, an elbow fitting on a pipe in communication with a source of supply of the fluid and surrounding the radially ported end of the spindle, said elbow fitting having an apertured flange for its rigid support, and a combined end and side thrust bearing within an offset hollow boss of the fitting to rotatively support the spindle.

4. A rotary fluid conducting means comprising an open tubular spindle embodying a diametrically enlarged cylindric head with a number of lateral inlet ports adjacent a diametrically-reduced axial-trunnion end, a fitting on a pipe in communication with a source of supply of the fluid surrounding the ported head and trunnion end of the spindle, said fitting having an aper-

5 tured supporting flange and an offset hollow boss, and a combined end and side thrust ball-bearing within the offset hollow boss of the fitting to rotatively support the axial-trunnion end of the spindle with provision for free flow of the liquid through and around said ball bearing.

5. The combination of claim 4 wherein the packing compressing means consists of a screw

gland, and the elbow fitting is provided with a hollow pivotal finger and screw means for locking said gland against accidental rotation, after being drawn up to compress the packing, said pivotal finger being restrained against turning by engagement of a hollow tail extension thereof over a lug on the elbow fitting. 5

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