

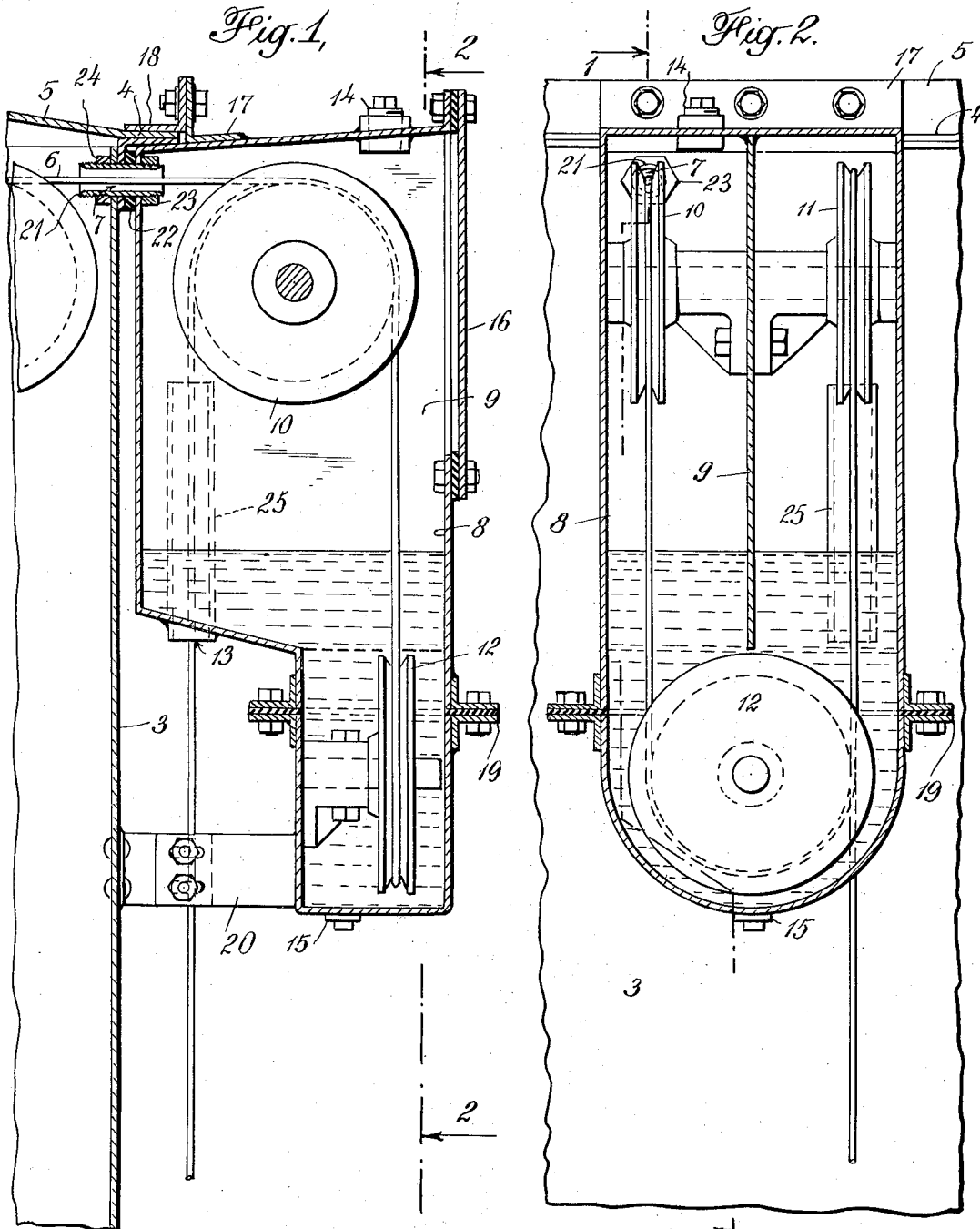
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VAPORPROOF SWING LINE CABLE SHEAVE

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VAPORPROOF SWING LINE CABLE SHEAVE

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1 Claim. (Cl. 254—190)

In oil storage tanks it is customary to fill and empty through a pipe which terminates in some form of adjustable extension within the tank. In this manner the vertical position of the point of withdrawal may be varied by raising or lowering the adjustable extension, which is known as the swing line. This raising and lowering is accomplished by means of a cable, passing over the tank wall, known as the swing line cable.

This invention has to do with a specific form of apparatus whereby a swing line cable may be passed through the wall of a vapor proof oil storage tank in such a way that the escape of vapors may be effectively prevented and fire hazards may be avoided.

Prior devices for this purpose of which I have knowledge consist usually of a simple packed gland, through which the cable passes. If tight enough to prevent leakage, these devices are usually too tight to allow free handling of the swing line. As a usual thing, due to corrosion troubles, lack of tightness of packing, failure to keep packing pulled up, and the like, these so-called vapor proof swing line fittings are not vapor proof.

It is an object of this invention to provide a vapor proof swing line cable fitting capable of being maintained in a vapor proof condition with a minimum of trouble, it is a further object to provide such a fitting through which the swing line fitting can be moved with a minimum of frictional resistance. A further object is to provide a fitting which may be attached to an existing tank with a minimum amount of alteration, and such other objects and advantages as may hereinafter appear.

All of these objects and advantages I have obtained by the construction herein set forth and shown in the drawing attached to and made a part of this specification. The drawing consists of two vertical sections of the apparatus, and these should be read together, like parts being given like numerals.

Fig. 1 is a sectional view taken on the plane indicated by line 1—1 in Fig. 2, and

Fig. 2 is a sectional view taken on the plane indicated by line 2—2 in Fig. 1.

This device consists of an arrangement of sheaves whereby the swing line cable is caused to pass first through a vapor space communicating only with the interior of the tank, then below the surface of a liquid seal, and then passed into the outer atmosphere. Devices somewhat similar in the adoption of a liquid seal have been used to allow the entry of light cables, such as gauge

tapes, sampling devices, etc., into vapor-tight tanks, but I am aware of no prior device specifically embodying those principles necessary for the successful functioning of a series of sheaves over which a large cable bearing a heavy load may be passed.

In the drawing, 3 is the tank wall, 4 is the roof angle of the tank, and 5 is the roof. Swing line cable 6 passes through the tank wall 3 by means of orifice 7. Mounted exteriorly of the wall is a sheave box 8, the upper portion of which is divided into two compartments by vertical partition 9. Mounted within one of these upper compartments is pulley 10, pulley 11 is mounted in the other compartment, and in the lower part of the box 8 is mounted a third pulley 12. Pulley 10 is so mounted that its plane of rotation is perpendicular to the tank wall, and it is in alignment with orifice 7.

Pulley 12 is in alignment with pulley 10, but preferably in a plane at an angle of 90° to that of 10. Pulley 11 is preferably mounted parallel to pulley 10. Swing line cable 6 passes over pulley 10, down around 12, up and over 11, and then is led down parallel to the tank wall, leaving box 8 through orifice 13, and proceeding to a winch, or similar device, not shown. The box 8 is filled with non-volatile oil, glycerine, salt solution, or other suitable sealing liquid to a point above the bottom of partition 9, this point being determined by the static liquid head necessary to balance pressure or vacuum within tank so that vapors from the tank may not pass from the compartment around pulley 10 to the one around pulley 11 and so be lost to the atmosphere. This sealing liquid also acts as a complete fire protection for the point of entry of the swing line cable to the tank. A fill plug 14 is provided whereby the liquid may be replenished, and a drain 15 is also furnished. An access door is provided by making the front plate of the upper compartment, shown by 16, in such a manner that it may be unbolted without disturbing the rest of the assembly. The whole box 8 is supported by angle iron 17, which is in turn bolted to angle iron 18 which may be welded or otherwise secured above the tank roof angle. Vapor tightness around orifice 7 is secured by bolting the box wall and tank wall together at this point with proper packing. I also find it preferable to construct the box 8 in two portions, making use of the circumferential joint 19.

A particular feature of this vapor-proof sheave box is its adaptability for ready installation on existing tankage. This adaptability is gained

by the fact that the box may be supported wholly by the angle irons 17 and 18, and by the brace 20. After being positioned upon the existing tank, the orifice 7 may be formed in the tank wall to register with the corresponding orifice in the box, and then a vapor-tight joint may be effected at this point by inserting threaded sleeve 21, carrying felt gasket 22, and the assembly tightened by means of lock nuts 23 and 24. Internal pipe 25 serves to prevent seal liquid from escaping through the cable exit 13.

I claim:

A vapor-proof swing line sheave box for vapor-tight oil storage tanks, comprising a vapor-tight box adapted to be mounted exteriorly upon the tank wall adjacent the upper edge thereof, means for attaching such box to the tank, communication means for permitting passage of a swing line cable through the tank wall to within the box at a point near the top thereof, said means comprising a vapor-tight packed joint, a

partition within said box positioned in a vertical plane perpendicular to the tank wall, extending from the top of the box to a point above the bottom thereof and serving to divide the top part of the box into two compartments, in one compartment a pulley so aligned as to receive the cable from the tank, in the bottom of the box a second pulley aligned with and mounted at an angle to the first, in the second compartment a third pulley aligned with the second pulley, exit means whereby the said cable may pass through the exterior wall of the second compartment, and in the bottom of the box a sealing liquid covering the second pulley and extending to a level above the bottom of the partition, which level is sufficiently high to prevent vapor communication between the two compartments of the box under conditions of pressure or vacuum normally existing within the tank.

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