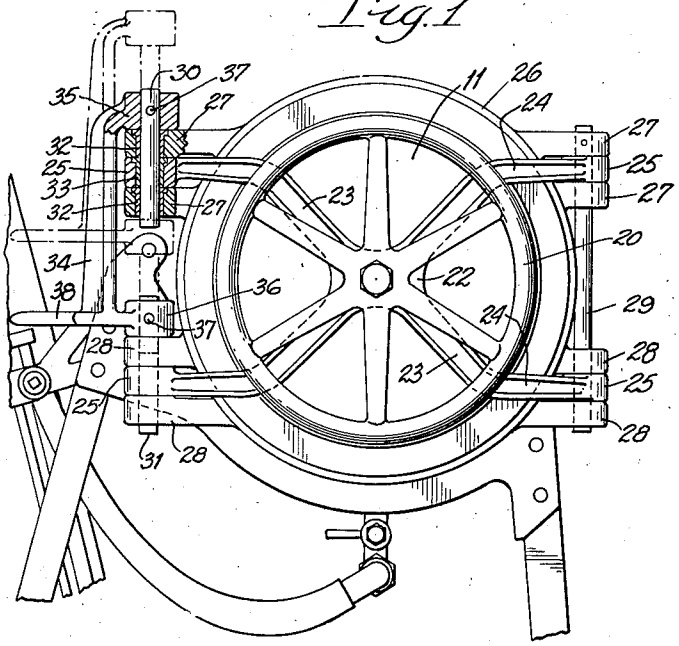
April 20, 1937. W. B. KLEIN 2,078,003

DOOR FOR TANKS

Filed March 30, 1936

Fig. 1



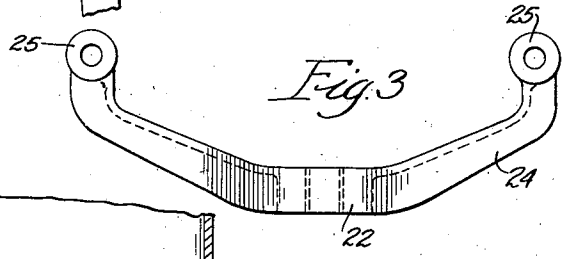
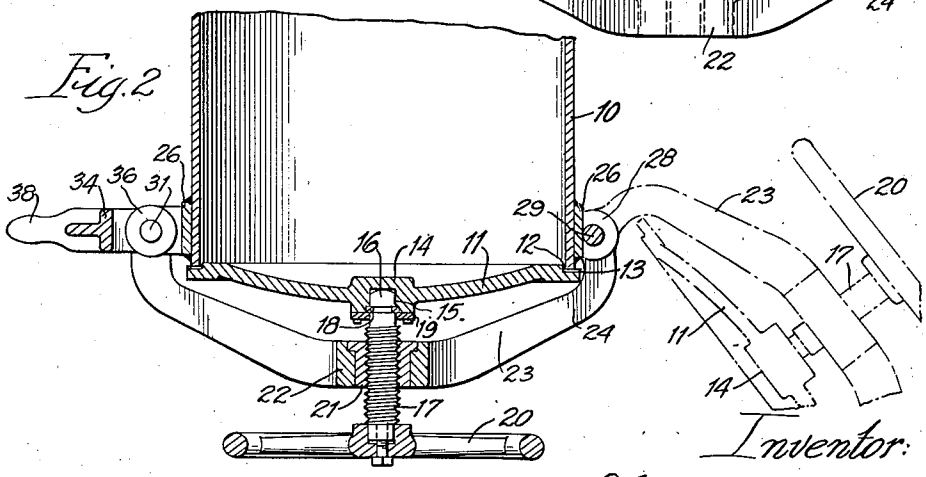


Fig. 3

Fig. 2



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DOOR FOR TANKS

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Application March 30, 1936, Serial No. 71,801

6 Claims. (Cl. 220—57)

The door of the present invention is designed primarily as a closure for the end of a beer racker tank and to meet the special requirements of such usage, although adapted for use as an end closure for tanks intended for other purposes. It is necessary in such circumstances to provide a door which may be tightly sealed under screw pressure against the open end of the tank, and which may be swung back out of the way to afford access to the interior. In sealing the door it is necessary to provide for the even compression around the entire rim of the tank and to provide a hinge mounting for the door which will enable the door to swing freely without rubbing or abrasion of the sealing ring or gasket, and the present invention is designed to satisfactorily meet these requirements.

The present invention is also designed to permit the door to be mounted interchangeably either on the right side or the left side of the tank, whichever position may be more convenient, and the door mountings are thus constructed to serve interchangeably either as a hinge pivot for the door or as a locking bolt, depending upon the desired direction of the door swing.

Further objects and details will appear from a description of the invention in conjunction with the accompanying drawing, wherein,—

Figure 1 is an end elevation of a beer racker showing the door of the present invention;

Fig. 2 is a sectional plan view through the tank and door; and

Fig. 3 is a side elevation of the spider for mounting the door.

The door of the present invention is employed as a closure for a tank having a cylindrical wall 10, which is closed at its end by the door 11 which is of concavo-convex formation presenting its convex face outwardly. The door is of circular contour and is provided around its rim with a shoulder 12 furnishing a marginal recess for the reception of a gasket 13 which bears against the rim of the tank. The door in its center is provided with a thickened boss 14 having in its outer face a recess 15 which receives the rounded head 16 of a threaded stem 17 having, as shown, a collar 18 which is engaged by an outer ring plate 19 which affords a ball and socket connection between the stem and the door for allowing the door to seat itself evenly upon the rim of the tank when swung to closed position.

The stem 17 at its outer end is provided with a hand wheel 20, and the threaded portion of the stem is threaded through a hardened bushing 21 carried by the center body portion 22 of a spider having radially extending legs 23, which legs at their outer ends terminate in arms 24 which are angularly disposed to the legs, as viewed in plan in Fig. 1. The spider is provided with four legs, and the terminal arm portions extend in parallel relation, the upper arm portions on each side and the lower arm portions on each side being respectively in alignment, as shown in Fig. 1. Each of the arms at its outer end is turned inwardly and terminates in a head 25 which is vertically bored to afford either a pivotal mounting or a locking connection as occasion may require. This gives to the spider an arch shaped contour, when viewed in edgewise relation as shown in Fig. 3, and carries the center or body portion 22 of the spider outwardly to a sufficient distance to operate the door and afford adequate clearance therefor.

As shown in Fig. 1, the tank is provided near its end with a collar 26 having on each side a pair of upper outwardly extending spaced lugs 27 and a similar pair of lower spaced lugs 28. The upper and lower lugs on each side are provided with vertically aligned bores, and, as shown in Fig. 1, the right hand set of upper and lower lugs receives a vertical pivot pintle 29, while the left hand upper lugs are adapted to receive an upper locking bolt 30 and the lower set of lugs a lower locking bolt 31. The collar 26 being circular, and the arrangement of the lugs being symmetrical, the collar can be positioned on the tank in such a way as to alter the positions occupied respectively by the pintle and by the locking bolts, which alters the direction of swing of the door.

All of the lugs are provided with hardened bushings 32, as illustrated in the upper left corner of Fig. 1, and in case of wear the bushings can be readily removed and replaced. Similar bushings 33 are provided within the bores through the terminal heads 25, and all of the bushings on each side of the door being vertically aligned will permit the proper assembly of the parts to receive the pintle or the locking bolts, as the case may be.

The locking bolts 30 and 31 are vertically aligned, and are mounted within a yoke 34 having an upper head 35 and a lower head 36, within which the respective bolts are mounted and held rigidly by cross pins 37. The yoke is provided with a handle 38, and, as shown, the yoke is of sufficient vertical length to span the distance between the uppermost upper lug 27 and the uppermost lower lug 28, so that when the yoke is drawn downwardly, as shown in full lines, the

bolts 30 and 31 will be entered through the aligned bores in the lugs and through the terminal heads 25, which serves to lock the spider in position, after which the hand wheel 20 can be rotated to advance the screw stem 17 and exert the necessary pressure to completely seal the door.

The arch formation of the spider and the method of pivoting enables the door to be swung freely away from the end of the tank when pressure is released by retracting the threaded stem, so that the sealing and unsealing of the door will be effected without rubbing or abrasion upon the sealing gasket, and at the same time the arrangement is one which enables the door to center itself perfectly when swung to closed position. The formation of the spider furnishes in effect a double arch construction which affords great rigidity, and at the same time the formation of the radial legs with the aligned terminal arms enables either pair of arms to serve as a pivotal mounting or as a locking element, depending upon the direction chosen for the swing of the door. Furthermore, the ring or collar 26, which carries the lugs 27 and 28, being rotatable upon the tank, can be fitted to any desired position, so that the door may swing either on a vertical pivot as shown or on a horizontal pivot, depending upon the desired arrangement.

The employment of upper and lower aligned locking bolts rigidly mounted within an adjustable yoke or frame permits the door to be locked at widely spaced points, and this, in conjunction with the spacing of the pivot mountings, distributes the strains and stresses at spaced intervals around the periphery of the door, so that the spider will swing truly at all times and may be closely fitted for accuracy without danger of binding or cramping or inaccurate fitting, the spider being sufficiently strong to resist all tendency to bend or warp when subjected to heavy pressures.

Although the device has been described with particularity as to detail, it is not the intention to limit the invention strictly to the form shown, since modifications therein may be made without departing from the spirit of the invention.

I claim:

1. In combination with a tank, an upper lug and a lower lug having aligned bores on one side of the tank and an upper lug and a lower lug having aligned bores on the opposite side of the tank, a spider having radially projecting members on one side provided with bores adapted to align with the bores in one pair of lugs and similar radially projecting members provided with bores adapted to align with the bores in the other pair of lugs, a pintle entered through the aligned bores on one side of the tank and slidable locking means entered through the aligned bores on the opposite side of the tank, a screw stem entered through the spider, and a door carried by the stem and adapted to seat against the end of the tank.

2. In combination with a tank, an upper lug and a lower lug having aligned bores on one side of the tank and an upper lug and a lower lug having aligned bores on the opposite side of the tank, a spider having radially projecting members on one side provided with bores adapted to align with the bores in one pair of lugs and similar radially projecting members provided with bores adapted to align with the bores in the other pair of lugs, a pintle entered through the aligned bores on one side of the tank, slidable locking bolts spaced from one another in aligned relation and a rigid yoke connecting said bolts and adapted to maintain the bolts in sliding aligned relation with the bores in the lugs on the opposite side of the tank, a screw stem entered through the spider, and a door carried by the stem and adapted to seat against the end of the tank.

3. In combination with a tank having a cylindrical wall, a pair of upper spaced lugs and a pair of lower spaced lugs on one side of the tank and a similar pair of upper spaced lugs and a pair of lower spaced lugs on the opposite side of the tank, the upper and lower pairs of lugs on each side of the tank having aligned bores, and the spacing of the lugs and the location of the bores being symmetrical on opposite sides of the tank to permit of interchangeable use, a spider consisting of a center body portion and two pairs of radiating legs terminating in parallel arms, the arms of each pair of legs being provided with bores adapted to align with the bores in the upper and lower pairs of lugs on either side of the tank to permit of interchangeable use, a pintle entered through the aligned bores of the lugs and arms on one side of the tank, and slidable locking means entered through the aligned bores of the lugs and arms on the opposite side of the tank, a screw stem threaded through the body of the spider, and a door having a socket for the inner end of the screw stem and adapted to seat upon the rim of the tank and be compressed thereon by the screw stem.

4. In combination with a tank having a cylindrical wall, a pair of upper spaced lugs and a pair of lower spaced lugs on one side of the tank and a similar pair of upper spaced lugs and a pair of lower spaced lugs on the opposite side of the tank, the upper and lower pairs of lugs on each side of the tank having aligned bores, and the spacing of the lugs and the location of the bores being symmetrical on opposite sides of the tank to permit of interchangeable use, a spider consisting of a center body portion and two pairs of radiating legs terminating in parallel arms, the arms of each pair of legs being provided with bores adapted to align with the bores in the upper and lower pairs of lugs on either side of the tank to permit of interchangeable use, a pintle entered through the aligned bores of the lugs and arms on one side of the tank, and slidable aligned bolt members in spaced relation and adapted to slidably enter the bores of the lugs and arms on the opposite side of the tank and a yoke for rigidly mounting the locking bolts and adapted to move the same in unison to locking and unlocking positions, a screw stem threaded through the body of the spider, and a door having a socket for the inner end of the screw stem and adapted to seat upon the rim of the tank and be compressed thereon by the screw stem.

5. In combination with a cylindrical tank, a ring encircling the wall of the tank near the end thereof, a pair of spaced upper lugs and a pair of spaced lower lugs on one side of the tank, said lugs being provided with aligned bores, a pair of spaced upper lugs and a pair of spaced lower lugs on the opposite side of the tank, said lugs being provided with aligned bores, a spider consisting of a center body portion and two pairs of radiating legs, the legs of each pair merging into parallel arm portions turned inwardly at their ends and terminating in heads provided with bores adapted to align with the bores of the lugs on either side of the tank for interchangeable mounting, a pintle entered through the aligned

bores of the lugs and heads on one side of the tank, slidable locking means entered through the aligned bores of the lugs and heads on the opposite side of the tank, a screw stem threaded through the body of the spider, and a door provided with a socket for receiving the inner end of the screw stem for permitting the door to be sealed by pressure exerted by the screw stem.

6. In combination with a cylindrical tank, a ring encircling the wall of the tank near the end thereof, a pair of spaced upper lugs and a pair of spaced lower lugs on one side of the tank, said lugs being provided with aligned bores, a pair of spaced upper lugs and a pair of spaced lower lugs on the opposite side of the tank, said lugs being provided with aligned bores, a spider consisting of a center body portion and two pairs of radiating legs, the legs of each pair merging into parallel arm portions turned inwardly at their ends and terminating in heads provided with bores adapted to align with the bores of the lugs on either side of the tank for interchangeable mounting, a pintle entered through the aligned bores of the lugs and heads on one side of the tank, aligned spaced bolts adapted to slidably enter through the aligned bores of the lugs and heads on the opposite side of the tank and a rigid yoke for mounting said bolts to permit the same to be moved in unison, a screw stem threaded through the body of the spider, and a door provided with a socket for receiving the inner end of the screw stem for permitting the door to be sealed by the pressure exerted by the screw stem.

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