

Jan. 2, 1951

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2,536,199

VARIABLE DIAMETER ROTOR FOR MANIFOLD VALVES

Filed Nov. 17, 1947

2 Sheets-Sheet 1

Fig. 1.

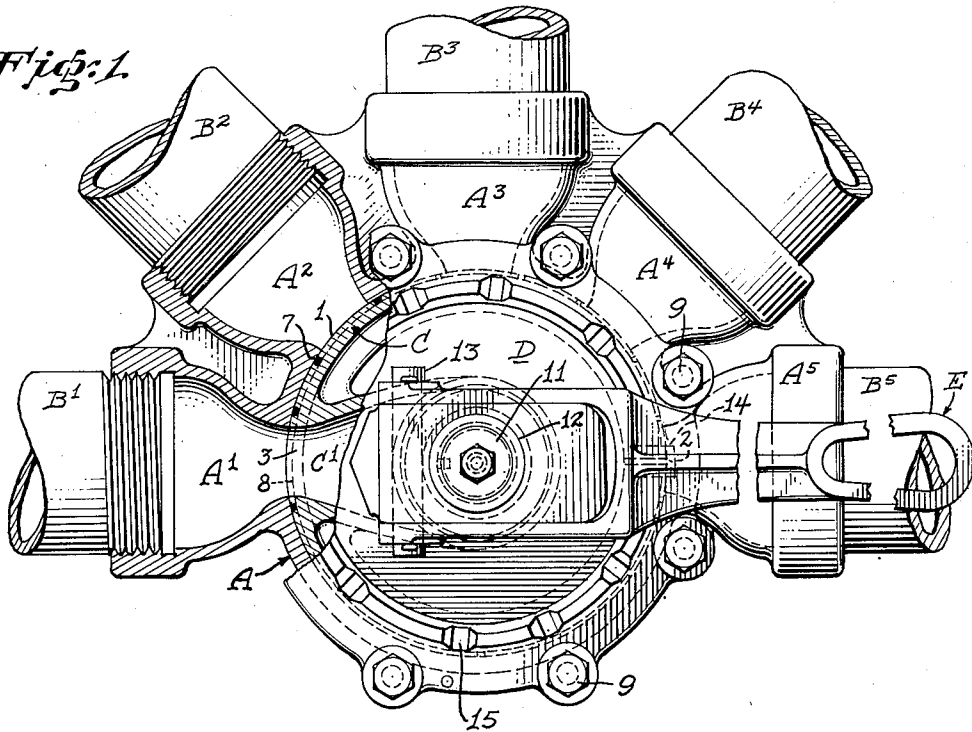
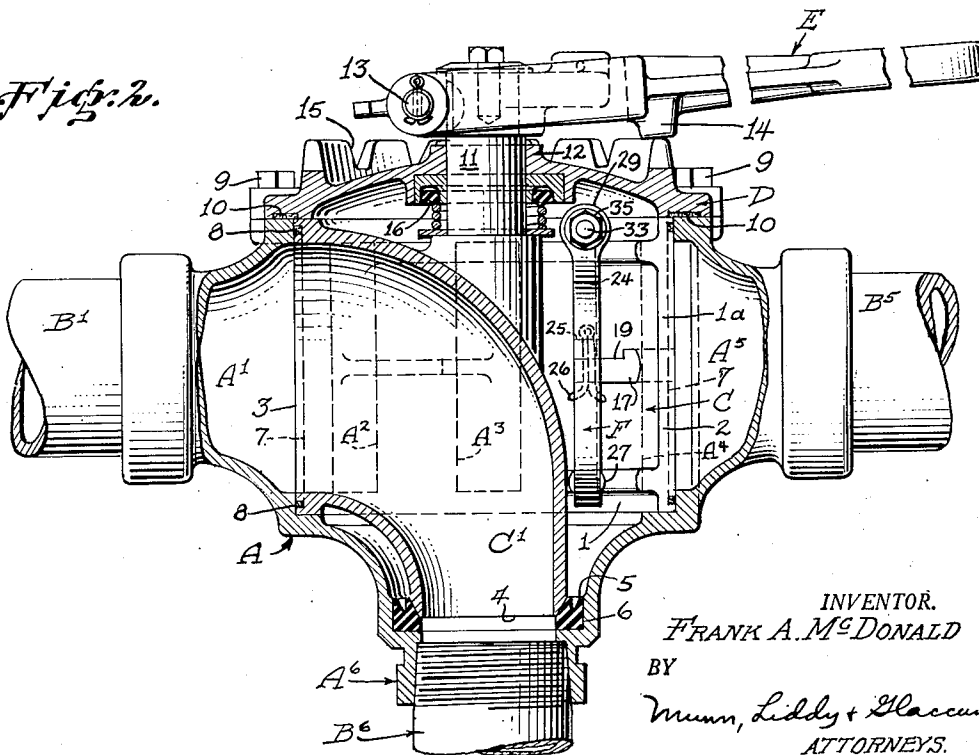


Fig. 2.



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Fig. 3.

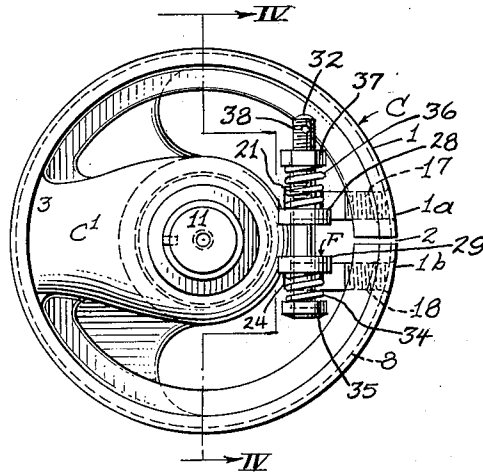


Fig. 4.

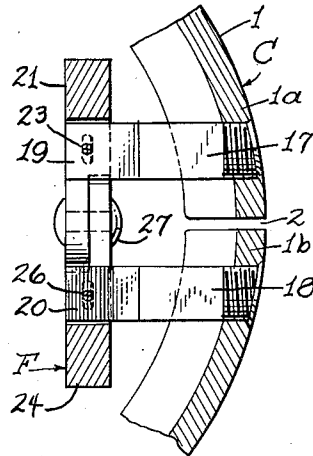
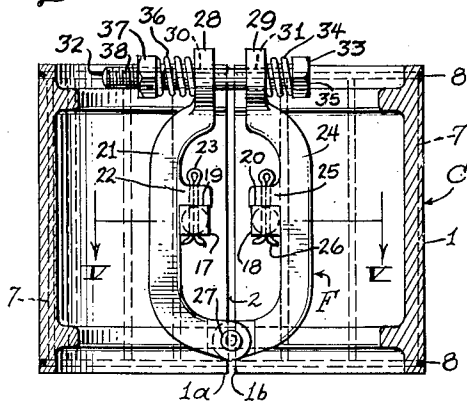


Fig. 5.

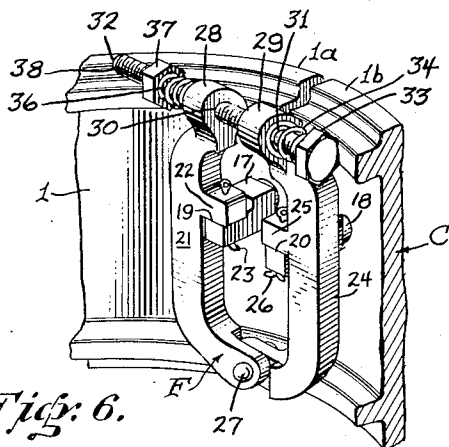


Fig. 6.

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UNITED STATES PATENT OFFICE

2,536,199

VARIABLE DIAMETER ROTOR FOR
MANIFOLD VALVES

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Application November 17, 1947, Serial No. 786,460

4 Claims. (Cl. 251-101)

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An object of my invention is to provide an improvement over the patent of William R. Dand on a multiple inlet valve, No. 2,341,531, issued February 15, 1944. In the patent a split rotor is shown and the rotor is rotatably received in a valve casing having a plurality of inlet openings. The patented valve is especially designed to be used on trucks that dispense various kinds of liquids such as gasoline, kerosene, etc. The split rotor carries sealing rings made of neoprene and it was found that a change in temperature or a change in the dispensing of one liquid to another, the split rotor rim would expand to a point where it would tend to "freeze" within the valve casing. Under such conditions it would be difficult, if not impossible, to rotate the valve rotor into a new position.

The principal object of my present invention is to provide a manifold valve in which novel means is used for changing the outer diameter of the split rim of the rotor so as to prevent any tendency of the rotor to "freeze" within the valve casing.

A further object of my invention is to provide a device of the type described in which the means for changing the outer diameter of the split rotor is carried by the rotor itself and is readily accessible for adjustment by the mere removal of the valve casing cover.

Another object of my invention is to provide a device of the type described in which the means for altering the outer diameter of the split rotor rim is controlled from a point near the top of the valve casing and yet the actual contraction of the rim is accomplished at a point midway between its top and bottom. In this way a uniform retraction or expansion of the rotor is effected.

My device is simple in construction and may be attached to the split rotor with but slight alterations being necessary in the latter.

Other objects and advantages will appear in the following specification, and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming a part of this application, in which:

Figure 1 is a top plan view of the manifold valve, a portion being broken away for clarity;

Figure 2 is a vertical section through the manifold valve with portions being shown in elevation;

Figure 3 is a top plan view of the rotor shown apart from the valve casing;

Figure 4 is a vertical section taken along the line IV-IV of Figure 3;

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Figure 5 is a horizontal enlarged section taken along the line V-V of Figure 4; and

Figure 6 is a perspective view of the adjusting means for the split rotor.

While I have shown only the preferred form of my invention, it should be understood that various changes or modifications may be made within the scope of the appended claims without departing from the spirit and scope of the invention.

In carrying out my invention I provide a valve casing indicated generally at A in Figures 1 and 2. The casing has a plurality of inlet ports A1 to A5, inclusive. It will be noted that one more inlet port is shown in the present valve casing than is shown in the patented valve above mentioned. I do not wish to be confined to any particular number of ports. The inlet ports receive inlet pipes B1 to B5, inclusive, and these communicate with various tanks, not shown, containing different liquids such as gasoline, kerosene, etc. An outlet port A6 leads from the lower portion of the valve casing A as shown in Figure 2 and an outlet pipe B6 communicates with this port.

I provide a split rotor C and rotatably mount this rotor within the valve casing. Figure 3 shows the rotor C provided with a rim 1 that is split at 2. The cylindrical surface of the rim 1 is provided with neoprene seals or other sealing medium which coact with the inner surface of the valve casing to prevent leakage of any liquid.

Referring to Figures 2 and 3, it will be noted that the rotor C has an inverted L-shaped fluid passage C1 that has an entrance opening 3 which is designed to communicate with any selected one of the inlet ports A1 to A5, inclusive. The passage C1 also has an outlet 4 that is aligned with the casing outlet A6 and with the outlet pipe B6. The wall of the passage C1 has its entrance end 3 made integral with the rim 1 of the rotor and has its outlet end 4 disposed concentric with the rotor axis and also with the axes of the casing outlet A6 and outlet pipe B6. A neoprene ring gasket 5 bears against the bevelled outlet end 4 of the passage C1 and is received in an annular recess 6 positioned close to the casing outlet A6.

The rim 1 of the rotor has grooves for receiving a plurality of vertically disposed linear seals 7, preferably made of neoprene and these seals are arranged to straddle the sides of the inlet ports A1 to A5, inclusive, when the rotor is in one of its selected positions. This arrangement prevents the liquid in the inlet ports disposed adjacent to the entrance 3 of the passage C1 from flowing into the passage and contaminating the liquid being drawn from the selected inlet port.

In addition, the rotor rim 1 has circular gaskets placed at the top and bottom of the inlet 3 and these gaskets prevent the flow of liquid from any of the inlet ports into the interior of the manifold casing A.

I provide a cover D for the casing A and this cover is held in place by cap screws 9 or other suitable fastening means. The cover has an annular seal 10 placed between its rim and the top of the casing. The split rotor has an upwardly extending shank 11 that is integral with the wall of the passage C1 and is axially aligned with the rotor axis and with the casing axis. The shank extends through a bearing 12 provided in the cover.

A handle E is pivotally connected at 13 to the shank so that the handle can rock about a horizontal axis. The handle is connected to the shank 11 so that a swinging of the handle radially around the casing axis will rotate the rotor therewith. A lug 14 is carried by the handle and is designed to enter the selected notch 15 provided in the cover. In this way the entrance 3 of the rotor passage C1 can be brought into accurate registration with any desired one of the inlet ports A1 to A5, inclusive. The handle E extends in the direction of the selected port so the operator knows with which port the passage C1 is aligned. Figure 2 shows a spring-pressed seal 16 for the shank 11 to make a liquid-tight fit between the shank and the cover.

I will now describe the novel means for changing the outer diameter of the split rim 1 for causing the rim to contact with the inner cylindrical surface of the rotor without creating undue friction therewith. In Figures 4 and 6 I show the ends 1a and 1b (see also Figure 5) of the split rim with threaded supporting members 17 and 18, respectively. Figure 6 clearly shows how the supporting members 17 and 18 are provided with flat bearing surfaces 19 and 20, respectively.

A pivoted yoke indicated generally at F in Figure 6 has one lever 21 provided with a lateral projection 22 that is pivotally supported on the flat bearing surface 19 by a cotter pin 23 or the like. A second lever 24 has a lateral projection 25 that rests on the flat bearing surface 20 and is pivotally connected thereto by a cotter pin 26 or the like. The two levers 21 and 24 are pivotally connected to each other at their lower ends by a rivet 27.

Figure 4 illustrates how the upper ends of the levers 21 and 24 are provided with ears 28 and 29, respectively, these ears being formed with central bores 30 and 31 for slidably receiving the shank 32 of an adjusting bolt 33. A coil spring 34 is placed between the ear 29 and the bolt head 35. A second coil spring 36 is placed between the ear 28 and a nut 37 that is mounted on the threaded portion 38 of the bolt. The construction is such that the coil springs 34 and 36 will urge the ears 28 and 29 toward each other and this will cause the levers 21 and 24 to be urged toward each other and pivot about their connecting pin 27. The projections 22 and 25 on the levers will also be urged toward each other and they will tend to move the members 17 and 18 toward each other for reducing the diameter of the split ring 1.

One of the novel features of the invention is the placement of the rim adjusting means at the top of the split rotor where access may be had to it upon removal of the valve casing cover D. Figure 2 illustrates how the adjusting bolt 33 is positioned near the top of the casing A where

there is plenty of room for tightening or loosening the nut 37 for altering the compressive force of the springs. Even though the adjustment is made at the top of the rotor for tightening the nut, the actual retracting force of the springs is applied to the split rim midway between the top and bottom of the rotor. In this way the retraction will be uniform and the top of the rotor rim will be kept at the same diameter as the bottom of the rim.

The tendency of the split rim is to spring outwardly and the coil springs 34 and 36 tend to retract the rim. Should the split rim contact with the inner cylindrical surface of the casing to too great an extent so as to make it difficult to rotate the rotor, the cover can be removed and then the adjustment made by tightening the nut 37. No machining of the rim to reduce its diameter is therefore necessary. The adjusting means for the rotor rim will not interfere with the normal function of the manifold valve.

I claim:

1. A rotor for a valve having a cylindrical split rim, the ends of the rim being spaced from each other a slight distance, a pair of inwardly extending projections, one being carried by each end of the split rim and being disposed substantially midway between the top and bottom of the rim, a pair of levers disposed within the split rim and extending substantially throughout the height of the rotor rim, the levers being pivotally connected together at one end, said levers having their midportions connected to the projections, and adjustable yielding means interconnecting the opposite ends of the levers for yieldingly urging these ends toward each other, whereby the levers will yieldingly urge the rim ends toward each other, the force being exerted on the projections so as to apply the yielding rim-contracting force substantially midway between the top and bottom of the rotor while permitting adjustment of the means at the rotor top.

2. A rotor for a valve having a cylindrical split rim, the ends of the rim being spaced from each other a slight distance, a pair of inwardly extending projections, one being carried by each end of the split rim and being disposed substantially midway between the top and bottom of the rim, a pair of levers disposed within the split rim and extending substantially throughout the height of the rotor rim, the levers being pivotally connected together at one end, said levers having their midportions connected to the projections, and adjustable yielding means interconnecting the opposite ends of the levers for yieldingly urging these ends toward each other, whereby the levers will yieldingly urge the rim ends toward each other, the force being exerted on the projections so as to apply the yielding rim-contracting force substantially midway between the top and bottom of the rotor while permitting adjustment of the means at the rotor top, said yielding means comprising a bolt having a head with a shank slidably received in the said opposite lever ends, a nut adjustable on the shank, a coil spring mounted on the shank and disposed between the head and one lever end, and a second coil spring mounted on the shank and disposed between the nut and the other lever end.

3. A rotor for a valve having a cylindrical split rim, a pair of levers disposed within the split rim and arranged one on each side of the split, said levers being connected to the ends of the rim defined by the split, the connection being substantially midway between the ends of the rotor,

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the levers being pivotally connected together at one end, and adjustable yielding means connecting the opposite ends of the levers together so that the cylindrical split rim will have a yielding force exerted on the split rim ends substantially midway between the ends of the rotor while permitting adjustment of the means at one end of the rotor.

4. A rotor for a valve having a cylindrical split longitudinal rim to define two rim ends; a pair of levers mounted within the rim with one being disposed on each side of the split, the mid portions of the levers being connected to the rim ends at points substantially midway along the length of the split; the levers being pivotally connected together at one end; and adjustable yielding means connecting the opposite ends of the levers together so that the cylindrical split rim will have a yielding force exerted on the split rim ends at points substantially midway between the

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ends of the rotor, said means being accessible at one end of the rotor for manual adjustment and including a bolt slidably received in said opposite ends of the levers, and springs mounted on said bolt and bearing against the said opposite ends of the levers, the bolt being adjustable for altering the force exerted by the springs.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
867,289	McConnell	Oct. 1, 1907
2,024,457	Kourimsky	Dec. 17, 1935
2,024,620	Yoder	Dec. 17, 1935
2,249,704	Detjen	July 15, 1941
2,341,531	Dand	Feb. 15, 1944