June 29, 1954 J. HEINEN 2,682,174

PLUG TYPE VALVE WITH VERTICAL ADJUSTMENT OF PLUGS

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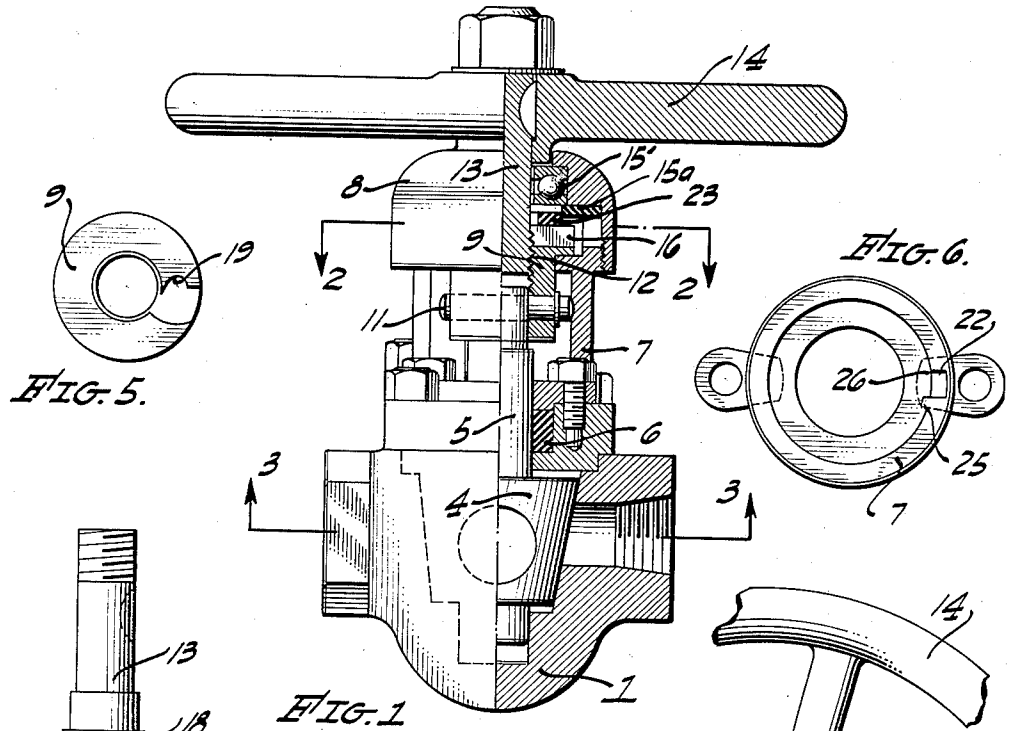

FIG. 1

FIG. 5.

FIG. 6.

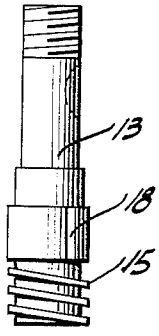

FIG. 4.

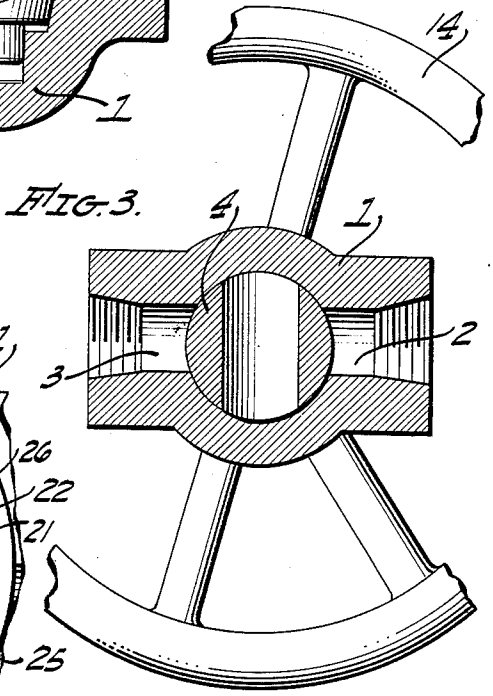

FIG. 3.

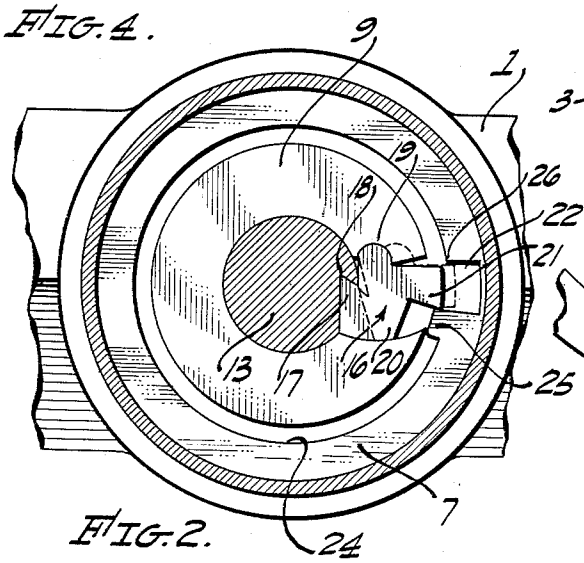

FIG. 2.

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PLUG TYPE VALVE WITH VERTICAL ADJUSTMENT OF PLUGS

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9 Claims. (Cl. 74—22)

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This invention relates to a plug type valve and particularly a valve in which there is a vertical adjustment of the plug on rotation of a single control handle or wheel used for the rotation of the plug.

An object of my invention is to provide a novel plug type valve in which rotation of the control wheel or handle will rotate the valve to either open or closed position and will also move the valve vertically to seat or unseat the plug in the body of the valve.

A feature of my invention is to provide a novel plug type valve of the character stated in which rotation of the control wheel or handle will rotate the plug to open or closed position and will also move the plug vertically to seat or unseat the same.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing—

Figure 1 is a partial longitudinal sectional view of my valve.

Figure 2 is a fragmentary sectional view taken on line 2—2 of Figure 1.

Figure 3 is a fragmentary sectional view taken on line 3—3 of Figure 1.

Figure 4 is a side elevation of the wheel shaft.

Figure 5 is a plan view of the collar.

Figure 6 is a plan view of the bonnet.

Referring more particularly to the drawing, the numeral 1 indicates a valve body which has intake and outlet ports 2—3 therein. A ported plug 4 is rotatably mounted in the body 1 and this plug includes a spindle 5 which rises vertically therefrom and projects upwardly through the body 1. The spindle 5 is suitably packed or sealed by means of the packing 6, all of which is usual and well known in the art.

A bonnet 7 is mounted on the body 1, preferably by suitable bolts or studs, and a cap 8 is threaded on to the bonnet. A collar 9 is rotatably mounted in the bonnet 7. The collar 9 is attached to the spindle 5 by means of the pin 11, thus fixedly uniting these parts for purpose to be subsequently described. The upper portion of the bore of the collar 9 is threaded, as shown in 12.

A wheel shaft 13 extends downwardly through the cap 8, and a wheel 14 is secured to the upper end of the shaft. The shaft is rotated by means of the wheel or handle 14, as will be evident. The lower end of the shaft 13 is provided with coarse left hand threads, as shown at 15, which mesh with the threads 12, thus connecting the shaft 13

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and the collar 9 and causing the collar 9 to be moved vertically when the threads 15 are screwed into or out of the threads 12. A thrust bearing 15′ is arranged between the cap 8 and a shoulder 15b on the shaft 13, thus preventing the shaft 13 from moving vertically relative to the cap, for purpose to be subsequently described. A ring 15a is positioned between the cap 8 and the top of the bonnet 7. This ring projects under the bearing 15′ to hold this bearing in position in the cap 8.

A dog 16 is rockably mounted in the collar 9, and this dog is provided with a spur 17, which is moved into engagement with the notch 18 in the face of the shaft 13. The dog 16 rocks on a bearing 19 and is provided with two wings 20 and 21. The wing 20 bears against an arcuate cut in the upper face of the collar 9, this cut being concentric with the bearing 19. The wing 21 projects into a notch 22 in the top rim of the bonnet 7. The dotted line position of the dog 16 in Figure 2 shows the position of the dog when engaging and dis-engaging the notch 18 of the wheel shaft 13. A spacer ring 23 is positioned on top of the collar 9 and this spacer ring engages the bottom of the bearing 15′ when the collar 9 moves upwardly, thus acting as a stop for the collar.

Operation

Assuming first that the plug 4 is in open position, that is, fluid is flowing through the ports 2—3:

As observed in Figure 2, the shaft 13 is now turned clockwise by means of the handle 14. The spur 17 of the dog 16 is positioned within the notch 18 and, consequently, rotation of the shaft 13 will also rotate the collar 9, the spindle 5, and the plug 4. The wing 21 is also riding on the annular wall 24 on the top of the bonnet 7, thus holding the spur into the notch 18, while the spindle 13 is dragging the collar 9 and causing the plug 4 to rotate. Notice also that the thrust is on the wing 20, this wing bearing against the recess in the collar 9, as shown in Figure 2.

When the plug 4 is in closed position, the wing 21 will engage the stop 25 and further rotation of the spindle 13 will swing the spur 17 out of the notch 18 and causing the dog 16 to move into the dotted line position, shown in Figure 2. The shaft 13 is now free to continue rotation without moving the plug 4, and this continued rotation will cause the threads 15 to screw into the threads 12, thus pressing the plug 4 downwardly into its seat. The valve is now closed and seated. To open the valve the handle 14 is turned counter-

clockwise and the first part of the rotation of the spindle 13 turns the threads 15 in the threads 12, thus lifting the plug 4 off of its seat and also pulling the collar 9 upwardly until the top of the collar presses against the spacer ring 23. At this time, the collar 9 will also bottom on the threads 15, and this locking is sufficient to cause the collar 9 to rotate with the spindle 13, and the spindle is so timed that the notch 18 is in position to receive the dog 17.

Observing Figure 2, it will be seen that the wing 21 is now engaging the edge 26 of the notch 22, and continued movement of the collar 9 will swing the dog 16 inwardly until the spur 17 is again within the notch 18. The thrust is then conveyed from the spindle 13 through the dog 16 to the bearing 19, thus turning the collar 9 counterclockwise and moving the plug 4 to the open position.

Having described my invention, I claim:

1. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, a threaded means on the upper end of said spindle, a wheel shaft threaded into said means, a dog pivotally mounted in said means and engaging said wheel shaft, whereby said means is rotated with the wheel shaft.

2. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, a threaded means on the upper end of said spindle, a wheel shaft threaded into said means, a dog pivotally mounted in said means and engaging said wheel shaft, whereby said means is rotated with the wheel shaft, and means engageable by the dog to disengage the wheel shaft and permit said wheel shaft to thread into said threaded means.

3. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, a threaded means on the upper end of said spindle, a wheel shaft threaded into said means, a dog pivotally mounted in said means and engaging said wheel shaft, whereby said means is rotated with the wheel shaft, and means engageable by the dog to disengage the wheel shaft and permit said wheel shaft to thread into said threaded means, and means engageable by the dog on rotation of said first named means to re-engage said dog with said wheel shaft.

4. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from said element, an internally threaded collar on the upper end of said spindle, a wheel shaft threaded into said collar, and dog means pivotally mounted on said collar and engageable with said wheel shaft to releasably couple said shaft and collar.

5. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from said element, an internally threaded collar on the upper end of said spindle, a wheel shaft threaded into said collar, and dog means pivotally mounted on said collar and engageable with said wheel shaft to releasably couple said shaft and collar, and a fixed stop lug engageable by said dog to disengage the dog from the wheel shaft.

6. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from said element, an internally threaded collar on the upper end of said spindle, a wheel shaft threaded into said collar, and dog means pivotally mounted on said collar and engageable with said wheel shaft to releasably couple said shaft and collar, and a fixed stop lug engageable by said dog to disengage the dog from the wheel shaft, and a fixed shoulder engageable by the dog on rotation of said collar to re-engage said dog with the wheel shaft.

7. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, an internally threaded collar on the upper end of the spindle, a bonnet mounted on said body, a wheel shaft journalled on the bonnet and threaded into said collar, a dog pivotally mounted on the collar, said wheel shaft having a notch therein engageable by the dog, whereby said wheel shaft and collar are rotated together.

8. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, an internally threaded collar on the upper end of the spindle, a bonnet mounted on said body, a wheel shaft journalled on the bonnet and threaded into said collar, a dog pivotally mounted on the collar, said wheel shaft having a notch therein engageable by the dog, whereby said wheel shaft and collar are rotated together, a stop lug on the body engageable by the dog to dis-engage the dog from the wheel shaft and permit said wheel shaft to thread into said collar.

9. A lift turn mechanism including a rotatable element mounted in the body thereof, a spindle rising from the element, an internally threaded collar on the upper end of the spindle, a bonnet mounted on said body, a wheel shaft journalled on the bonnet and threaded into said collar, a dog pivotally mounted on the collar, said wheel shaft having a notch therein engageable by the dog, whereby said wheel shaft and collar are rotated together, a stop lug on the body engageable by the dog to dis-engage the dog from the wheel shaft and permit said wheel shaft to thread into said collar, and a shoulder engageable by the dog in dis-engaged position to re-engage said dog with the wheel shaft and permit simultaneous rotation of the wheel shaft and said collar.

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