April 5, 1949. G. A. HUMASON 2,466,313

VALVE ASSEMBLY

Filed April 30, 1945

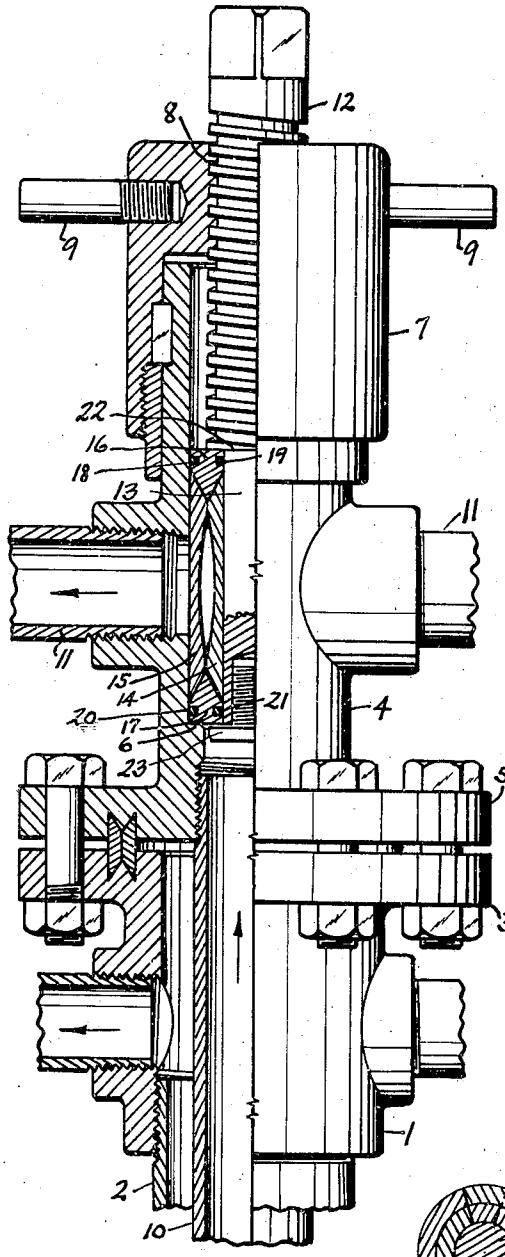


Fig. 1.

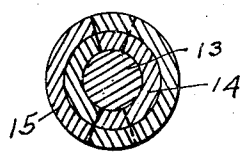


Fig. 3.

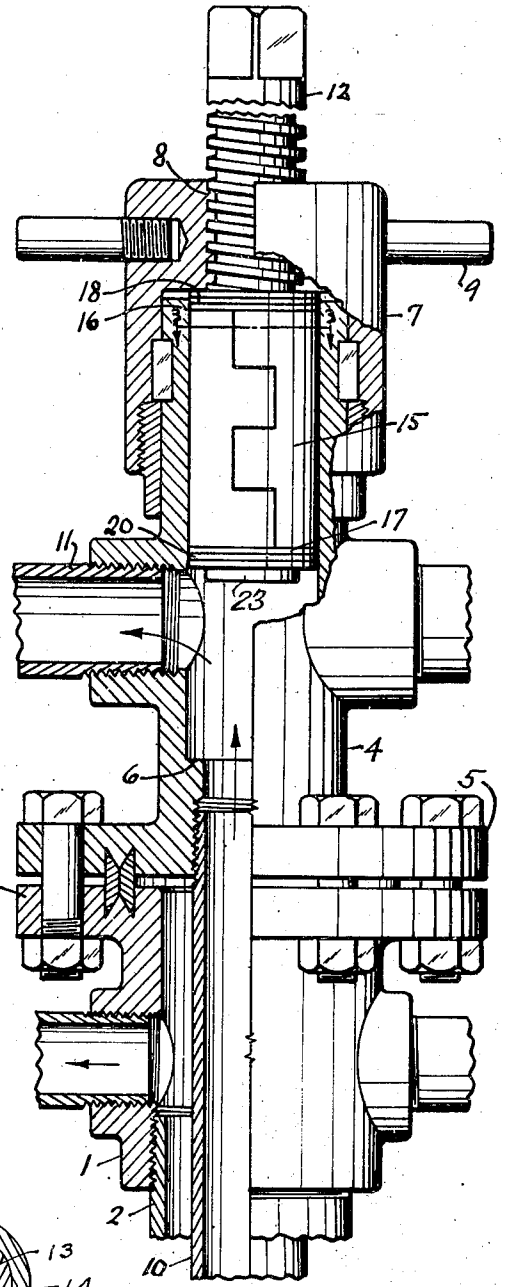


Fig. 2.

Inventor

Granville A. Humason

By E. V. Hardway

Attorney

Patented Apr. 5, 1949

2,466,313

UNITED STATES PATENT OFFICE

2,466,313

VALVE ASSEMBLY

Granville A. Humason, Houston, Tex.

Application April 30, 1945, Serial No. 591,093

2 Claims. (Cl. 251—63.5)

1

This invention relates to a valve assembly.

An object of the invention is to provide a valve assembly of the character described embodying a valve casing having a passageway for fluid therethrough with a controlling assembly in the casing movable to one position to close said passageway and to another position to open the passageway to permit the flow of fluid.

Another object of the invention is to provide a valve assembly of the character described wherein the controlling assembly, referred to, includes an expansible element with means for moving said assembly to open or closing position and with means for applying endwise compressive force to said expansible element when the controlling assembly is at the limit of its movement in either direction whereby said passageway will be closed and sealed when the controlling assembly is in one position and the valve casing will be sealed when the controlling assembly is in another position to prevent leakage thus dispensing with the necessity of providing packing to prevent leakage through the valve casing.

The type of valve assembly herein described has been particularly designed for use on well heads either as a flow controlling valve or as a drilling valve for use while carrying on drilling operations or other operations in the well.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein—

Figure 1 shows a side elevation partly in section showing the valve in closed position.

Figure 2 shows a similar view showing the valve open and

Figure 3 shows a cross sectional view taken on the line 3—3 of Figure 2.

Referring now more particularly to the drawings wherein like numerals of reference designate the same parts in each of the figures, the numeral 1 designates a well head, such as a casing head which is connected to the upper end of the well casing 2 and whose upper end has the external, annular flange 3.

The numeral 4 designates a cylindrical valve casing whose lower end has an external annular flange 5 which is bolted to the flange 3. This valve casing has an internal annular shoulder 6 at one end and a cap 7 is mounted to swivel on the other end of the casing.

The cap 7 has the internal coarse threads 8 and is provided with means for rotating the same such as the handles 9.

2

The casing 4 is tubular in form and is in alignment with the well tubing such as 10 which may be suspended therefrom and is also provided with one or more lateral outlets as 11 above the shoulder 6 so that the well fluid may flow upwardly through the casing and out through said outlets when the valve is open but when the valve is closed it will form a seal with the valve casing so as to not only completely close the well tubing 10 but will also close the outlets 11.

Threaded through the cap 8 there is a rod or shaft 12 whose inner end 13 is reduced and blank. This reduced end 13 forms the body of a controlling assembly which will now be described.

This controlling assembly includes the concentric inner and outer sleeves 14 and 15 which are preferably formed of durable, flexible metal or similar material and which are split on one side, as shown in Figure 2, so that they will radially expand. Their facing sides are also preferably convex, annularly, so that they will be more flexible. The inner sleeve fits closely around the body 13 and the outer sleeve fits closely in the casing 4. Their ends diverge outwardly, as shown in Figure 1, and between these diverging ends are the wedge rings 16 and 17 which are preferably formed of metal. The wedge ring 16 has an outer sealring 18 and an inner sealring 19 therearound and the other wedge ring has an outer sealring 20 and an inner sealring 21 therearound. These sealrings form seals between the wedge rings and the outer valve casing 4 and the controlling assembly body 13.

The assembly including the outer and inner sleeves and wedge rings are confined between the annular shoulder 22, formed by the reduction of the inner end of the rod 12, and the head of the cap screw 23 which is screwed into the inner end of the body 13.

It is obvious that as the cap 7 is turned the rod 12 and the controlling assembly will be moved longitudinally in the valve casing 4. When the controlling assembly is not under compression it may be readily moved into one position to close the passageway 11, as shown in Figure 1, or into another position to open said passageway, as shown in Figure 2.

When the valve assembly is moved to the closed position shown in Figure 1 the wedge ring 17 will abut the shoulder 6 and upon a further turning movement of the cap 7 the shoulder 22 will apply an endwise compressive force to the controlling assembly thus wedging the wedge rings between

the sleeves so as to cause an expansion of the outer sleeve and a contraction of the inner sleeve so as to form fluid tight seals with the inside wall of the casing 4 and with the body 13, thus also closing the passageway from the well tubing.

Upon rotation of the cap 7 in the other direction this compression will be relieved and the sleeve will relax and the assembly may then be readily moved to the open position shown in Figure 2. Thereupon the wedge ring 16 will contact the opposing end of the cap 7 and upon further rotation of said cap an endwise compressive force will be applied to the wedge ring 17 by the head 20 thus again expanding the outer sleeve 15 and contracting the inner sleeve 14 so as to form seals with the casing 4 and the body 13 to prevent leakage of fluid. No supplemental packing for the shaft or rod 12 will be necessary.

It is to be understood that the flow lines 11 are equipped with suitable valves for controlling the same.

The drawings and description disclose what is now considered to be a preferred form of the invention by way of illustration only while the broad principle of the invention will be defined by the appended claims.

What I claim is:

1. A valve assembly comprising, a cylindrical valve casing having a passageway for fluid therethrough, a valve in the casing including an inner body and concentric inner and outer expansible sleeves around the body, wedge rings arranged in the casing to wedge between the sleeves, seals between the wedge rings and the casing and body, respectively, means for moving the valve into position to close or open said passageway and means arranged to co-act with the wedge rings to expand the outer sleeve and contract the inner sleeve when the valve has reached the limit of its movement in either direction.

2. A valve assembly comprising, a cylindrical valve casing having a passageway for fluid therethrough, a valve in the casing including an inner body and concentric inner and outer expansible sleeves around the body, wedge rings arranged in the casing at the ends of the respective sleeves to wedge between the sleeves, means for moving the valve into position to close or open said passageway and means arranged to co-act with said rings to expand the outer sleeve and contract the inner sleeve when the valve has reached the limit of its movement in either direction.

GRANVILLE A. HUMASON.

REFERENCES CITED

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

FOREIGN PATENTS

Number	Country	Date
331,216	France	July 22, 1903
454,546	France	Oct. 2, 1936