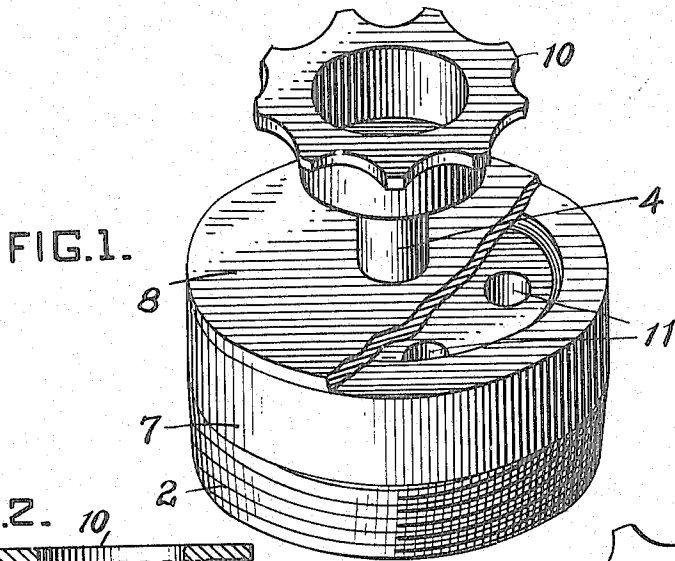
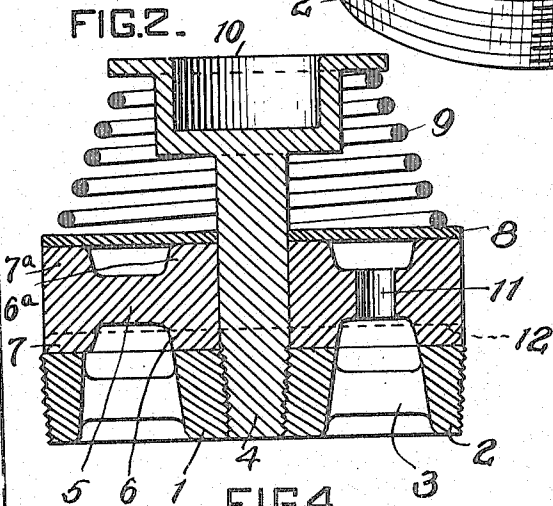
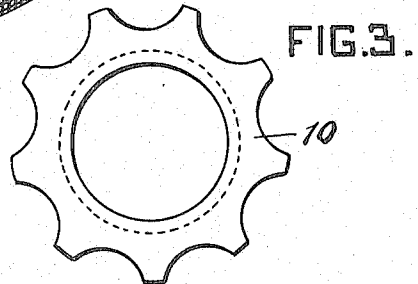
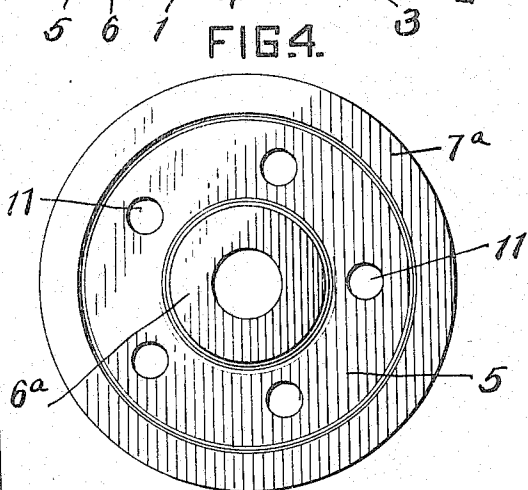
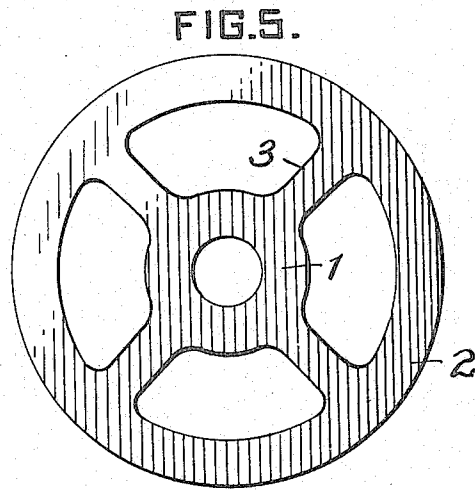


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PUMP VALVE.
APPLICATION FILED JAN. 24, 1914.

1,129,072.

Patented Feb. 23, 1915.



WITNESSES:
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PUMP-VALVE.

1,129,072.

Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed January 24, 1914. Serial No. 814,115.

To all whom it may concern:

Be it known that I, CHARLES A. CONN, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Pump-Valves, of which improvement the following is a specification.

The object of my invention is to provide a valve for high pressure pumps, which, although of relatively light construction and hence easily operated, will not be broken by repeated excessive pressures on one side of it; which will not leak because of ridges being worn in the bearing surface of the closure; and which will be simple and inexpensive to manufacture, and longlived in service.

In the accompanying sheet of drawings, which form part of my specification, I have illustrated the preferred embodiment of my invention.

Figure 1 is a perspective view of the complete valve, a portion of the top plate being broken away; Fig. 2 is a central vertical sectional view; and Figs. 3, 4 and 5 are plan views, respectively, of the top of the stem, valve closure, and valve seat.

In the several figures like numerals are used to designate like parts.

In the practice of my invention I employ a valve seat consisting of a central ring 1 and an annular ring 2, such rings being integrally connected to each other by radial bars 3, as particularly shown in Fig. 5. The outer cylindrical surface of the ring 2 is screw-threaded for attachment to an orifice in a high pressure pump casing, and the center of the ring 1 is also preferably screw-threaded to receive a stem 4. Such seats have been used heretofore in valves of the character contemplated by my invention, and various forms of closures have been used in connection with them. It has been found that, when plane faced disk closures are used, the radial arms 3, by reason of the continued opening and closing of the valve, wear grooves or depressions in the face of the disks, it being understood that such arms afford essential supports for such disk in addition to the central and annular rings of the valve seats. After grooves have been thus worn in the closure, the valve frequently leaks because of a relative rotary

movement between closure and seat bringing the grooves out of register with the arms. To overcome this difficulty, valve closures have been provided with central and peripheral bosses adapted to bear, respectively, upon the central and annular rings of the valve seat, such bosses forming a groove concave toward the seat; and in order to make such closures sufficiently rigid to withstand the excessive pressures, metal plates or other reinforcing members have been attached usually to the back of such boss-provided disks. In practice it has been found almost impossible, due regard being given to simplicity and economy in construction, to attach the reinforcing member to the resilient closure in such a manner that in continued service the connection will not be broken. Furthermore such reinforced closures are usually not reversible, at least this is the case in such closures as have sufficient merit to be put in actual practice.

The valve closure which I employ and which I will now particularly describe, is reversible, does not have a reinforcing member attached to it, will not leak by reason of grooves being worn in its surface, and will not be broken by the pressure of the fluid acting on it. As illustrated in the drawings it consists of a disk made of any suitable material softer than the valve seat, and having an annular web 5 and central and peripheral bosses 6, 6^a, and 7, 7^a, projecting, respectively, as shown herein, beyond the lower and upper faces of the web. The bosses 6 and 7 form an annular groove, concave toward the bars 3, and the bosses 6^a and 7^a a similar groove on the opposite side of the web 5. A plate 8, unattached to the disk, bears upon the upper faces of the bosses 6^a and 7^a and closes the groove formed between them. This plate is loosely mounted on the stem 4, so that it may move longitudinally thereon, and is held yieldingly against the disk by means of a compression spring 9, bearing at opposite ends against the plate and a shoulder 10 formed at the end of the stem. A further and very essential feature of construction of the valve consists of the provision of holes 11 through the web 5 of the disk, and without these holes the disk would, in service, be broken by the

fluid pressure. These holes permit the fluid from the lower side of the disk to fill the groove formed between the bosses 6^a and 7^a, and thus the pressure on each side of the web 5 is equalized.

It will be observed of my invention that the disk bosses adjacent to the valve seat have a continuous even bearing, and that they will therefore wear down evenly thus preventing leaks. Before the bosses 6 and 7 have worn down to the plane of the web, that is, to a plane indicated approximately by the dotted line 12, the disk may be reversed, there being then a shallower, but nevertheless entirely adequate groove adjacent to the plate 8 to equalize the pressure on each side of the web 5. The disk may then be used until the bosses 6^a and 7^a have been entirely worn away as well as a portion of the web 5, the upper surface of the bars 3 being below the general bearing plane of the valve seat so that leakage-causing depressions or grooves will not, after the bosses are worn away, be formed in the plane face of the disk web. By this construction, used in the manner described, substantially all of the disk-forming material may be effectively utilized,

thus affording a long-lived and inexpensive valve.

I claim as my invention:

In a high pressure pump valve, the combination of a seat having central and annular rings with connecting bars between them, a reversible closure disk consisting of an annular web and central and peripheral bosses projecting beyond said web and forming annular grooves on each side of the disk, the web of said disk being provided with a plurality of pressure equalizing holes adapted to place said grooves in fluid communication with each other, the bosses on one side of the disk being adapted to bear on said seat rings, a plate extending over and closing the groove on the opposite side of the disk, said plate being unattached to the disk, and means for holding said plate yieldingly against the disk.

In testimony whereof I have hereunto set my hand.

CHARLES A. CONN.

Witnesses:

PAUL N. CRITCHLOW,
FRANCIS J. TOMASSON.