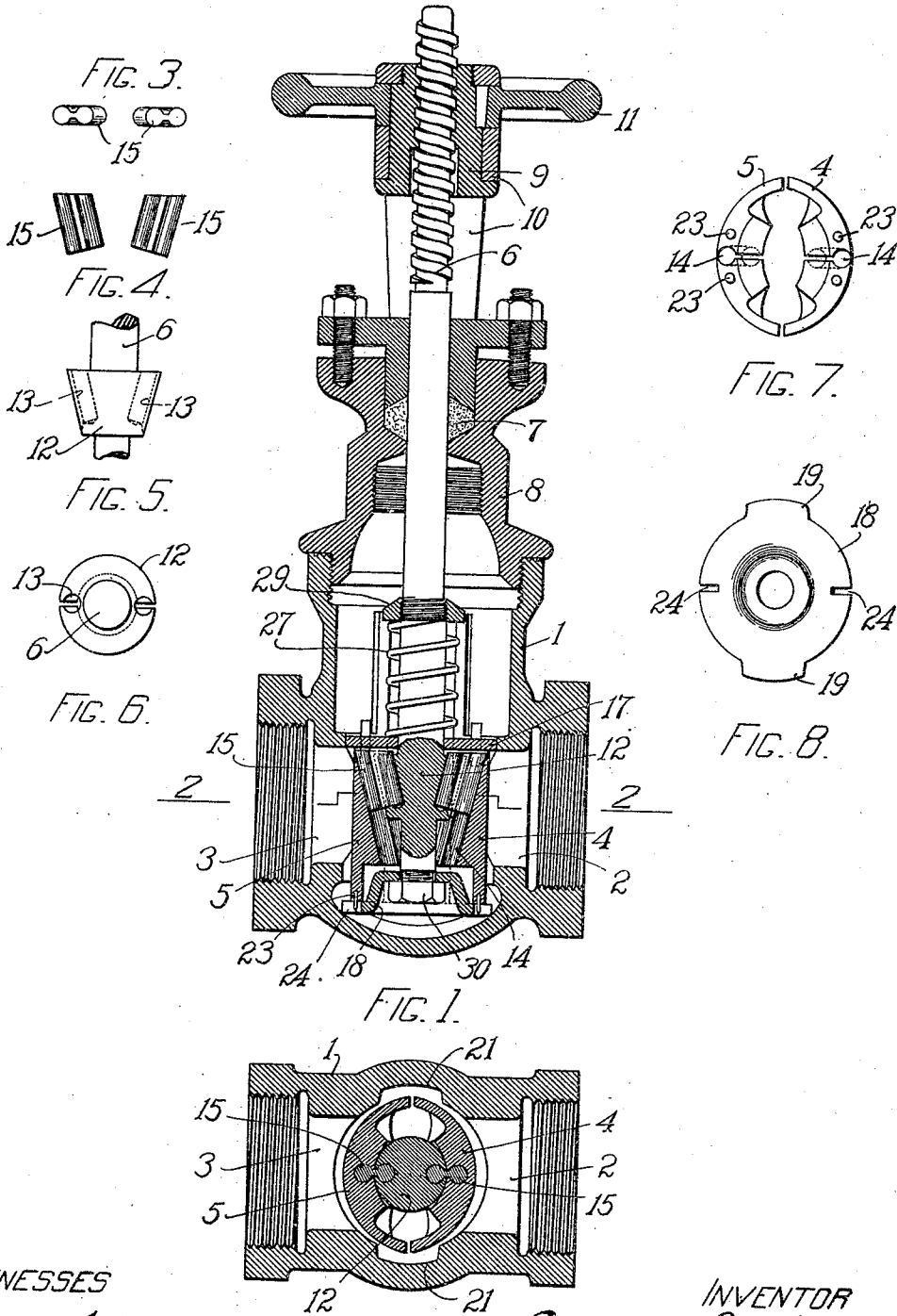


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VALVE.

APPLICATION FILED APR. 9, 1908.

959,349.

Patented May 24, 1910.



WITNESSES

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VALVE.

959,349.

Specification of Letters Patent. Patented May 24, 1910.

Application filed April 9, 1908. Serial No. 426,052.

To all whom it may concern:

Be it known that I, EUGENE D. JEFFERSON, a citizen of the United States, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in straight way valves.

In the use of valves in connection with fluids under high pressure it has been found that at the first opening and the last closing movement of a valve the friction of the valve member on the seat and the erosion of the fluid caused by the rapid flow are so great as to cause excessive wear, so that the valve soon leaks, owing to the destruction of the accurate engagement between the valve surface and seat. This effect is so marked that it is usually necessary, when a valve in a high pressure system is to be opened or closed, to temporarily stop the pump by which the pressure is maintained, thereby relieving the pressure while the valve is being operated, or to equalize the pressure on the opposite sides of the valve by means of a by-pass, in order to avoid excessive wear on the seats.

The object of the present invention is to produce a valve for use in connection with high pressure systems, which may be opened or closed under pressure without substantial injury from erosion, and in which the pressure of the valve member against its seat due to the pressure may be more easily overcome than in the usual form of gate valve, so that the wear due to friction is largely eliminated and it is possible that a large valve working under great pressure may be readily opened or closed.

The invention consists in the valve hereinafter described and particularly defined in the claims.

The following is a description of the invention, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view, of a valve embodying the present invention; Fig. 2 is a section on line 2—2 in Fig. 1, and Figs. 3 to 8 inclusive are detail views hereinafter described.

The illustrated embodiment of the inven-

tion comprises a body 1 provided with an inlet 2 and an outlet 3 closed respectively by a valve 4 and a valve 5 (see Fig. 7). The valves are opened and closed by means of a stem 6 passing through a stuffing box 7 in a dome 8 forming a part of the valve body, and the stem is moved upwardly and downwardly to open or to close the valve by means of a nut 9 mounted in a yoke 10 on the dome 8 and actuated by a hand-wheel 11. The lower end of the stem 6 is provided with a conical wedge 12 (see Figs. 5 and 6) which engages directly the inclined rear surfaces of the valves 4 and 5 to enable the wedge to move the valves toward the seats. In order to have the wedge draw the valves back from the seats, the wedge and valves are provided with corresponding inclined slotted grooves 13 and 14 respectively and are connected by dumb-bell links 15, (see Figs. 3 and 4) which have an interlocking relation with the wedge and valves the valves thus constituting a collapsible cylinder.

The valves 4 and 5 are held vertically by the upper plate 17 and a lower plate 18, (see Fig. 8) both of these plates being provided with ears 19 adapted to slide in vertical slots 21 in the body 1. The valves 4 and 5 are provided with pins 23 which engage slots 24 in the plates 17 and 18 in order to prevent rotary movement of the valves. A compression spring 27 engages at one end a collar 29 on the valve stem and presses against the upper plate 17 tending to normally force the plate and valves downwardly with respect to the valve stem, so as to hold the valves in retracted position when the valve stem is raised. The plate 18 is retained in position by a nut 30 on the end of the stem.

An important feature of my construction resides in the fact that the faces of the valves and the seats are cylindrical and with this form the wear upon the valve faces and seats, due to the erosion of the fluid when the valves are withdrawn from their seats, is greatly diminished, since the fluid strikes the valve faces not perpendicularly but at an angle. Furthermore, this form of valve faces greatly conduces to economy of construction and the saving of time and labor in the manufacture of the valve, since it permits the interior of the casing and the valve seats to be bored and reamed at one operation and thereby insures perfect form. The faces of the valve are turned on a lathe in

the usual manner. It is thus possible to secure an absolutely perfect fit between the faces of the valves and the valve seats and to secure that fit with a minimum expenditure of time and labor. I have found, however, that it is preferable to have the curve of the faces of the valves of slightly larger radius than the curve of the valve seats and thereby the vertical edges of the valves when moved toward the valve seats first strike against the seat and the pressure then exerted by the wedge bends the valve into the seat and forms a perfectly tight fit.

While the illustrated embodiment is regarded as the best form of the invention it is to be understood that the claims, except when specifically limited thereto, are to be construed as covering other forms of valve comprehended by the following claims:

1. A valve, having, in combination, a casing provided with a cylindrical valve chamber, an outlet and an inlet, an inlet valve and an outlet valve having semi-cylindrical faces, plates for supporting the valves in vertical position, means on the valves cooperating with the plates for preventing rotary movement of the valves a conical wedge located between the said valves and means for actuating said parts to first move the wedge relatively to the valves to remove the valves directly from their seats and then to remove the plates and valves from the line of flow, substantially as described.

2. A valve, having, in combination, a casing provided with a cylindrical valve chamber, an outlet and an inlet, valve members therefor, a conical wedge located between the valve members, and dumb-bell links having an interlocking relation with said valve members and said wedge whereby they are

actuated to open and close the outlet and inlet, substantially as described.

3. A valve, having, in combination, a casing provided with a valve chamber, an outlet and an inlet, an outlet valve and an inlet valve, actuating means for moving said valves into and out of said valve chamber, and dumb-bell links having interlocking relation with said valves and actuating means whereby the valves are actuated to open and close the outlet and inlet, substantially as described.

4. A valve, having, in combination, a casing provided with a cylindrical valve chamber, an outlet and an inlet, an outlet valve and an inlet valve having semi-cylindrical faces, plates for supporting the valves in vertical position, means on the valves cooperating with the plates for preventing rotary movement of the valves, and means located between the valves for moving them into and out of the valve chamber and for spreading and retracting them to close and open the outlet and inlet, substantially as described.

5. A valve, having, in combination, a casing provided with a cylindrical valve chamber, an outlet and an inlet, a collapsible cylinder, actuating means for moving said cylinder into and out of said chamber, a conical wedge for expanding said cylinder to close the outlet and inlet, and dumb-bell links between the wedge and the cylinder.

In testimony whereof I affix my signature, in presence of two witnesses.

EUGENE D. JEFFERSON.

Witnesses:

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ANNIE C. RICHARDSON.