

O. E. OLESON.
VALVE.

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963,385.

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Fig. 2

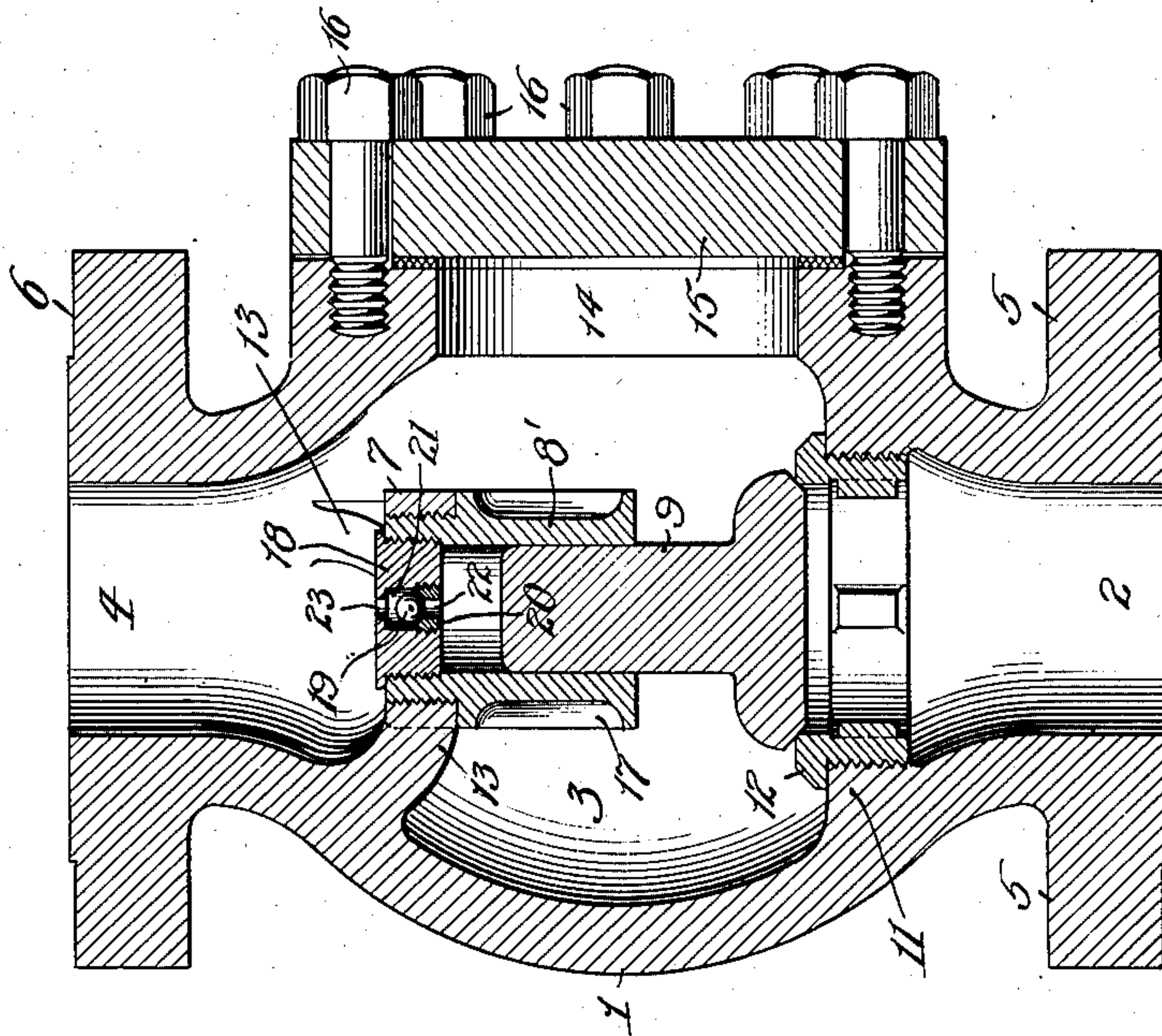
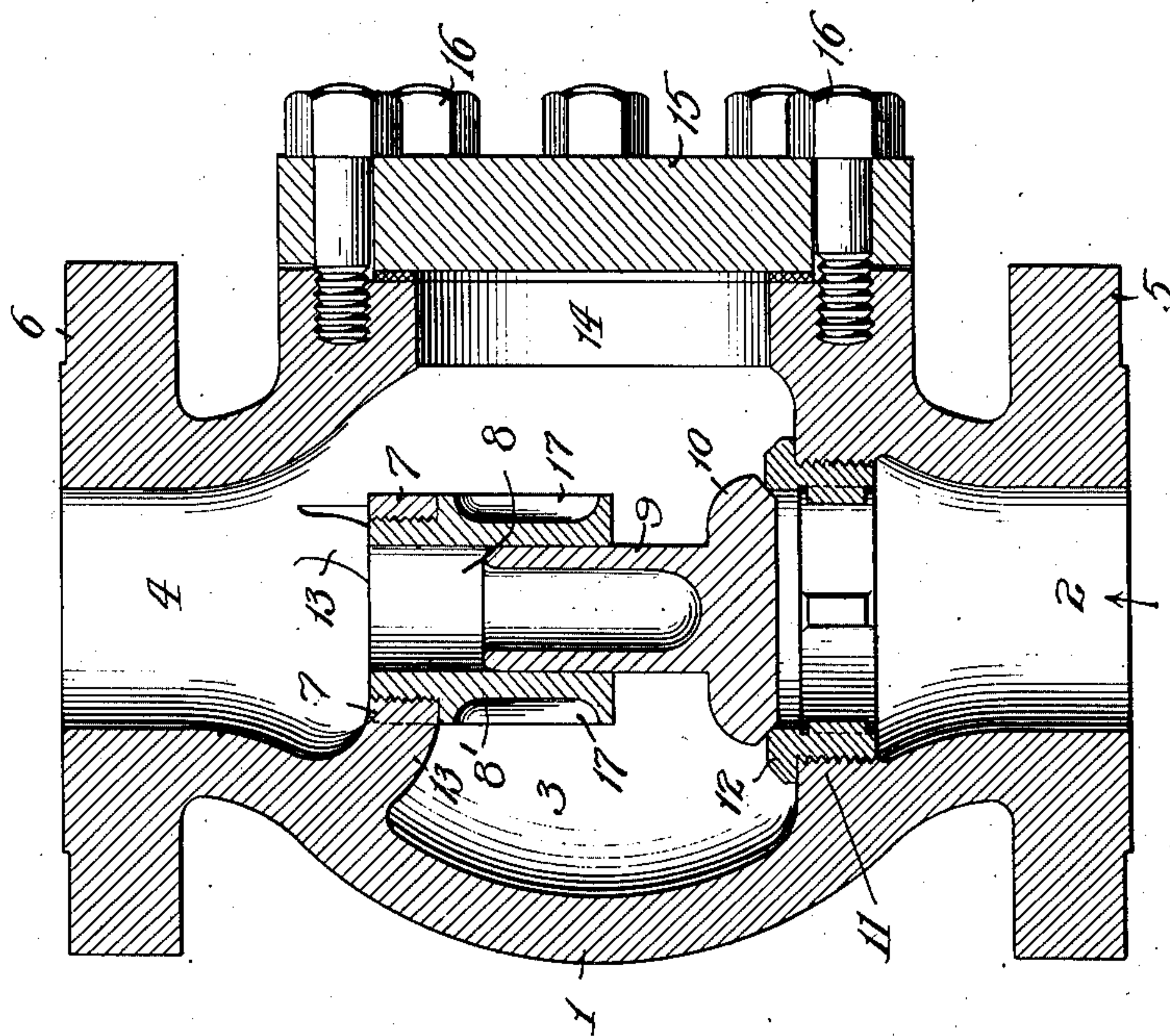


Fig. 1



Witnesses:
Ed. C. Quinlan
Charles J. Schmidt.

Inventor:
Olaf E. Oleson

By Offield, Toole, Gravers & Offield
Attys.

UNITED STATES PATENT OFFICE.

OLAF E. OLESON, OF CHICAGO, ILLINOIS.

VALVE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, OLAF E. OLESON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valves, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to valves, particularly to check valves, and has for its object improved construction and arrangement.

The valve of my construction is particularly adaptable for high pressure superheated steam work. In valves used for such work the steam flow about the valve disk should be free and uniform, so that there will be no localization of wire-drawing effects and the valve disk should be so arranged as to respond quickly and readily without binding or distorting. In this high pressure high temperature work repairs are frequently necessary and provision should also be made so that the operative parts can be easily and quickly reached for inspection or repairs.

One of the salient objects of my invention is, therefore, to so construct and arrange the parts that the valve disk can move freely and so that the steam flow about the disk and valve parts will be free and unhindered, the steam flowing equally and uniformly about the disk thus to prevent localization of wire-drawing.

Another salient object is to so arrange the parts to provide means whereby the parts can be readily detached and removed for inspection or repairs without disturbing the connection of the valve body in its circuit. The construction can also be so modified that the disk will move quickly in one direction but will be retarded to any desired degree in its movement in the reverse direction.

In the accompanying drawing which illustrates my invention and all its features—Figure 1 is a diametral sectional view of the valve body and the valve parts showing the valve disk free to move quickly in either direction; and Fig. 2 is a similar view showing means for retarding the movement of the valve in one direction.

The valve body 1 may be of any suitable construction but is preferably disposed vertically as shown, being provided with an

inlet passageway 2, a valve chamber 3, an outlet passageway 4 and suitable flanges 5 and 6 whereby it may be coupled into circuit. Extending horizontally inwardly from the valve body at a point just below the outlet passageway 4 is a shelf 7 having a circular opening 8 which is concentric with the passageways 2 and 4. This opening is also threaded for receiving the upper threaded end of a cylindrical guide sleeve 8 for receiving and guiding the stem 9 extending upwardly from the valve disk 10. An annular flange 11 extends horizontally from the body just above the entrance passageway 2 and is threaded to receive the annular seat 12 to be engaged by the disk 10. The valve disk and seat may be of any suitable construction for the purposes of my invention. With the arrangement described the valve disk will reciprocate vertically and will always be parallel with the seat. The shelf 7 is supported from the body by a plurality of thin webs 13 so that there will be practically no obstruction to the flow of steam which can pass unhindered from the passageway 2 to the valve chamber 3 and out at passageway 4. The steam, therefore, flows uniformly all around the valve disk and with uniform pressure and velocity so that there can be no localization of wire-drawing effects and, therefore, if there is any wire-drawing the wear on the seat and valve disk will be uniform and efficient seating maintained. The steam also flows straight through the valve body and is not deflected, as is the case in prior valves in which the steam must flow through several angular passageways.

At the side of the body between the entrance and outlet passageways I provide an opening 14 which is normally closed by a lid 15, as by means of cap screws 16. If it is desired to inspect the valve parts this lid is removed and the operative parts are plainly visible and accessible. The size of the opening 14 is also such that the valve parts can be readily removed therethrough without in any way disturbing the connection of the valve body.

The guide sleeve 8 has notches 17, in which suitable tools may be applied for unscrewing the sleeve from the shelf 7 and when thus unscrewed, the sleeve and stem 9 can be telescoped together into compact form and removed through opening 14. The seat 12

can also be readily unscrewed and removed through opening 14 and thus all the operative parts of the valve can be taken out where they can be carefully inspected and most quickly repaired, and the re-insertion of the parts can be as readily accomplished as their removal.

In Fig. 1 the valve disk is free to respond and to move quickly in either direction and is preferably cored out, as shown, to give greater lightness. It is sometimes desired, however, to retard the downward movement of the disk to prevent pounding of the seat and in Fig. 2 I have shown means for retarding the downward movement of the disk. The sleeve 8, instead of being open at the top as in Fig. 1, is provided with a head 18 which may be screw-threaded into the upper end of the sleeve as shown, thus forming with the sleeve a cylinder in which the stem 9 travels. A check valve 19 is provided in the head which operates to allow unrestricted upward movement of the stem in the sleeve but which will retard the downward movement thereof so that the engagement of the valve disk with the seat will be cushioned. The check valve may be of any suitable construction. I have shown this valve in the form of a ball, whose seat is a plug 20 screwed into the lower end of the valve chamber 21, the plug having the passageway 22 and the passageway 23 leading upwardly to the exterior from the valve chamber. Thus, when the valve is moved upwardly the steam or air within the cylinder can escape unhindered through passageways 22, 23 and the valve chamber, but the downward movement of the valve will be retarded as the ball engages its seat. The construction may be such that the ball tightly engages the seat and provision made for sufficient leakage between the stem and cylinder to allow the valve to slowly descend. Instead of this leakage small by-passes may be provided in the seat, or elsewhere, so that there will be sufficient passage past the ball to allow descent of the valve. The valve and stem with this arrangement can also be solid so that gravity will also assist in re-seating the valve. In practice the entrance passageway 2 connects with the boiler and the outer passageway 4 connects with the line. If the boiler pressure exceeds the pressure of the line to which other boilers may also be connected, the check valve will quickly raise to equalize the pressures. So long as the boiler and line pressures are equal it is immaterial whether the check valve closes but if the line pressure becomes greater than the boiler pressure, the excess pressure acting on the valve will cause seating of the valve, and where the arrangement in Fig. 2 is used this seating will be sufficiently retarded to prevent injury to the seat. Even though the valve should become stuck for some rea-

son or other it will be immediately released and seated if the line pressure exceeds the boiler pressure.

A valve of my construction is very desirable, as by its use interruptions are reduced to a minimum. If the parts of any valve should become worn and do not operate efficiently, it is a very simple matter to remove these parts and to insert duplicate parts, and the worn parts by being entirely removed from the valve body can be most efficiently repaired, and this can all be done without in the least disturbing the valve frame. In valves of the prior art the entire valve body must be uncoupled from the line, which requires a great deal of time and therefore causes lengthy operation interruptions. The unhindered and uniform steam flow through the valve of my construction produces maximum efficiency.

Changes in both construction and arrangement can of course be made which will still come within the scope of my invention and I do not, therefore, wish to be limited to the exact construction and arrangement which I have shown and described.

I desire to secure the following claims by Letters Patent:

1. In a check valve, the combination of a vertical valve body having a central valve chamber and having an inlet passageway at its lower end and an outlet passageway at its upper end communicating with said chamber, a horizontal valve seat between the entrance passageway and chamber, a valve disk for said seat, a stem extending vertically upwardly from said disk, a supporting shelf at the upper end of the valve chamber extending from the body and cast integral therewith, a guide sleeve having threaded engagement with and removably suspended from said shelf and receiving said stem to guide and to at all times maintain the disk parallel with the seat, and a normally closed opening through the valve body through which said valve disk and its guide sleeve may be removed upon disconnection of the sleeve from its supporting shelf.

2. In a check valve, the combination of a vertical frame forming a valve chamber and forming a lower entrance passageway and an upper outlet passageway communicating with said chamber, said passageways and chamber being of circular cross section and in axial alinement, an annular valve seat removably secured to the frame between the inlet passageway and the chamber, a valve disk, a cylindrical stem extending upwardly from said disk concentrically with said inlet and outlet passageways, an annular shelf supported from said frame, a guide sleeve for said stem removably threaded to said shelf, and a normally closed side opening in said frame through which said seat, disk

and sleeve may be removed without disturbing said frame.

3. In a check valve, the combination of a vertical frame forming a spherical valve chamber, a lower inlet passageway and an upper outlet passageway communicating with said chamber, said passageways being of circular cross section and in axial alignment with said chamber, a removable horizontal valve seat supported from the frame between the inlet passageway and the chamber, an annular shelf supported from the frame at the upper end of the chamber, said shelf being concentric with said passageways, a cylindrical sleeve detachably suspended from said shelf, a valve disk, a cylindrical stem extending upwardly from said disk to fit into and reciprocate in the lower end of said sleeve whereby said disk is at all times maintained parallel with the seat, a head at the upper end of said sleeve, check valve mechanism in said head for allowing unhindered inward movement of the stem in said sleeve and for retarding the outward movement of said stem thereby to cushion the seating of said disk, and a normally closed side opening in said frame through which the disk and stem and the detachable sleeve and seat may be removed from the frame without disturbing the frame.

4. In a check valve, the combination of a vertical frame forming a valve chamber and forming a lower entrance passageway and an upper outlet passageway, said passageways and chamber being of circular cross-section and in axial alignment, a valve seat in said entrance passageway, a valve engaging said seat having an upwardly cylindrically ex-

tending stem, an arm cast integral with the wall of the valve chamber and extending radially inwardly and expanding to form an annular shelf concentric with said passageways, a sleeve removably threaded at its upper end in said shelf and extending downwardly to receive and to guide said valve stem, there being a side opening in the wall of the valve chamber adjacent said valve and sleeve, a removable cover for said opening, and abutments on said sleeve for facilitating its application to and removal from said supporting shelf, said opening being of a size to admit passage therethrough of said sleeve and said valve.

5. In a check valve, the combination of a frame forming inlet and outlet passageways and an intermediate chamber, said chamber and passageways being concentric, there being a side opening in the frame adjacent said chamber, a removable cover for said opening, a valve seat at said entrance passageway, a valve engaging said seat and having a stem extending therefrom, a threaded shelf cast integral with said frame within said chamber and concentric with said passageways, and a guide sleeve having threaded engagement with said shelf and extending therefrom and receiving said valve stem, said opening being of sufficient size to enable passage therethrough of said sleeve and valve.

In witness whereof, I hereunto subscribe my name, this 2nd day of August, 1909.

OLAF E. OLESON.

Witnesses:

CHARLES J. SCHMIDT,
SAMUEL N. POND.