

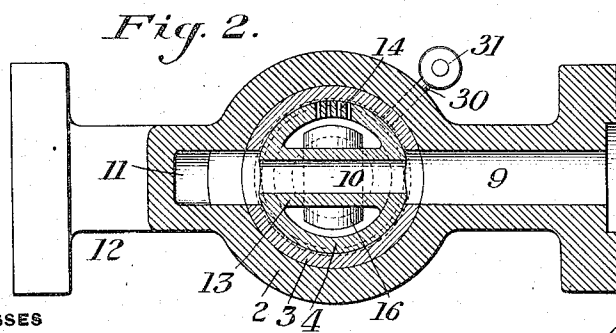
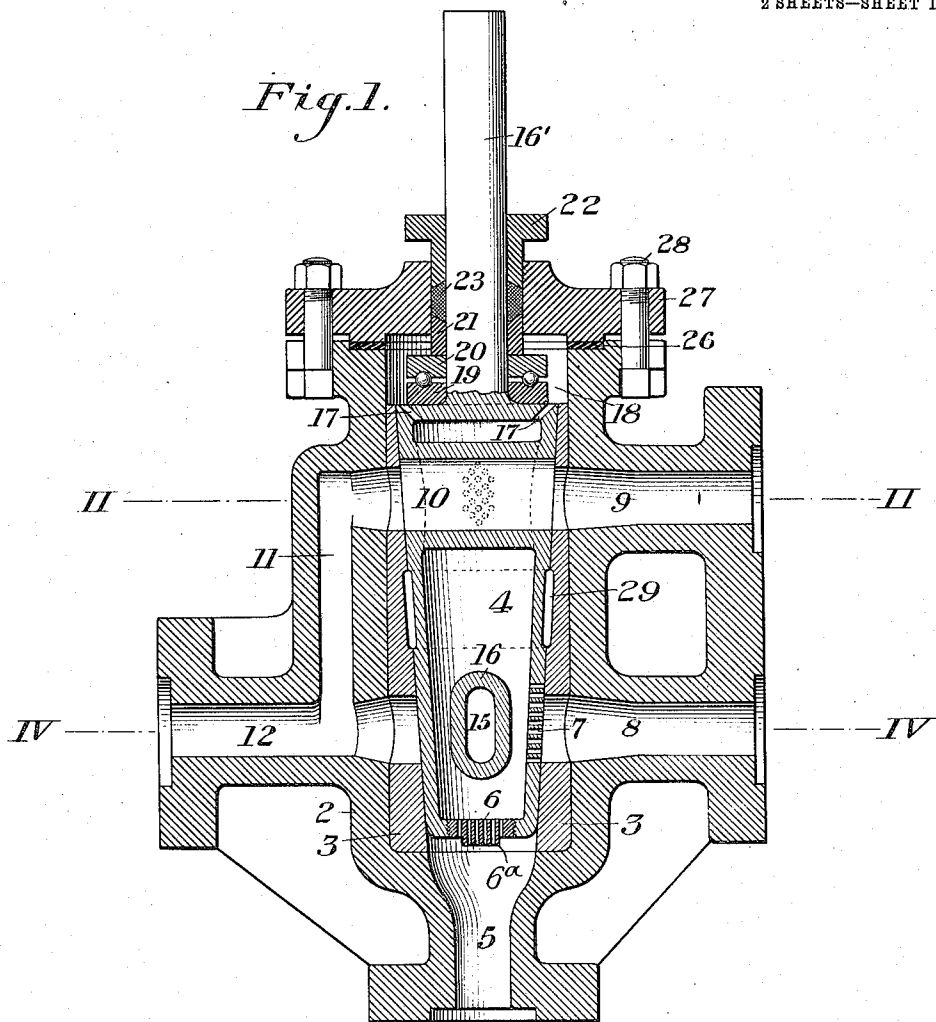
No. 873,476.

PATENTED DEC. 10, 1907.

H. WOODS.
VALVE FOR FLUIDS UNDER PRESSURE.

APPLICATION FILED JUNE 15, 1905.

2 SHEETS—SHEET 1.



WITNESSES

At Balderson
Warren W. Swartz

INVENTOR

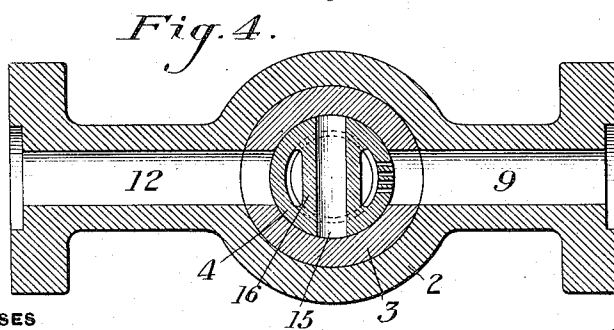
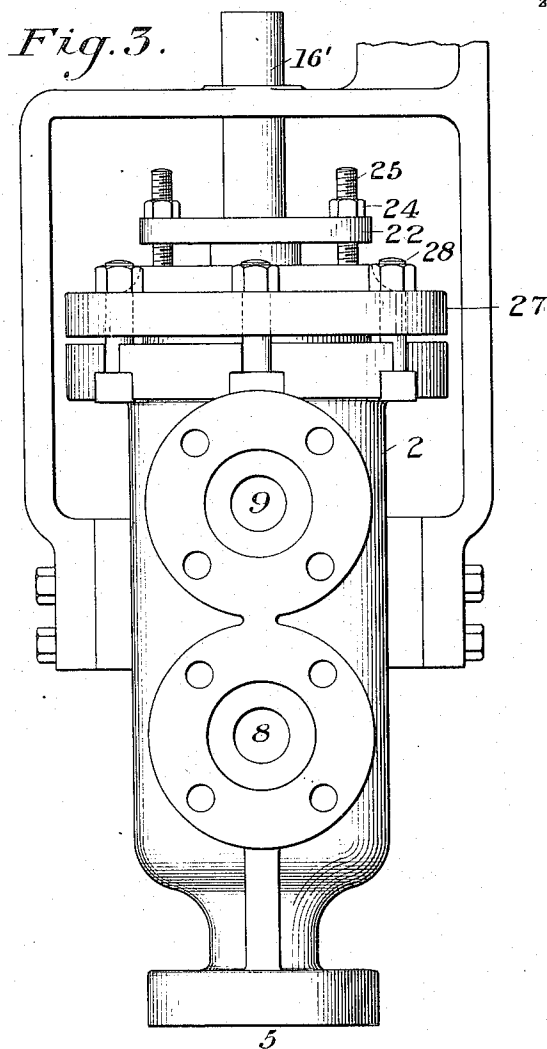
Harry Woods
by Balderson & Swartz
his attys

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2 SHEETS—SHEET 2.



WITNESSES

R. A. Balderson
Warren W. Swartz

INVENTOR

Harry Woods
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UNITED STATES PATENT OFFICE.

HARRY WOODS, OF STEUBENVILLE, OHIO.

VALVE FOR FLUIDS UNDER PRESSURE.

No. 873,476.

Specification of Letters Patent.

Patented Dec. 10, 1907.

Application filed June 15, 1905. Serial No. 265,441.

To all whom it may concern:

Be it known that I, HARRY WOODS, of Steubenville, Jefferson county, Ohio, have invented a new and useful Valve for Fluids Under Pressure, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical longitudinal section of my improved valve; Fig. 2 is a cross-section on the line II—II of Fig. 1; Fig. 3 is a side elevation of the valve; and Fig. 4 is a cross-section on the line IV—IV of Fig. 1.

My invention relates to the valves for controlling fluid-pressure, such as water, under pressure, and more especially to the valve set forth in my co-pending application No. 245,104 filed February 10th, 1905, for fluid pressure valve.

The object of the invention is to improve certain parts of the valve set forth in said application.

The present invention is of the turning plug type and it is an important object of the invention to effect a water-tight fitting of the plug in the casing in a new and highly effective manner. In this connection, it is proposed to have the walls of the hollow turning plug relatively thin and of sufficient resiliency to be forced outwardly by internal pressure into a fluid-tight fit with the walls of the casing.

A further object of the invention is to have the turning plug balanced by fluid pressure against the supply pressure, thereby to permit of the convenient turning of the plug.

In the drawing, 2 represents the valve-casing having a cylindrical cavity provided with a tapered bushing or lining 3. This bushing is fixed in position within the cylindrical cavity and within it fits the hollow tapering plug-valve 4. The cavity in this valve is connected at its lower end to the inlet-port 5 of the valve by which water enters the cavity through a strainer 6. This strainer is screwed into the lower end of the hollow valve and is provided with a series of perforations or holes, and it is preferably extended at its central portion to form a wrench-hub 6^a by which it may be turned into and out of position. The water flows through the interior of the valve and through the port 7 into the casing-port 8 which leads to one end of the motive cylinder. The water is exhausted from the other end of the motive cylinder through the port 9 in the

casing, and the port 10 of the valve into the branch-exhaust port 11 which leads into the main exhaust port 12. The port 10 in the valve extends through a transverse plug or stem 13, so that this port 10 is closed off from the inner cavity of the hollow valve. The valve is also provided in its upper portion with a port 14 which may be brought into registry with the port 9 for supplying water to the other end of the cylinder; and in its lower portion is a transverse port 15 formed in a through-plug 16 which cuts off the port 15 from the interior of the valve.

When the valve is turned to bring the port 14 into registry with the port 9, the port 15 will be in registry with port 8. In this position of the parts the water will flow into the hollow valve, thence through ports 14 and 9 to the cylinder, while the exhaust will flow back through ports 8 and 15 to the exhaust 12. In order to reduce the cutting action in the valve supply ports 7 and 14 I preferably form these ports with a succession of small holes over the port areas.

Attention is here directed to the fact that the inlet port 6 of the plug is continuously in communication with the inlet port 5 of the casing, whereby the plug is always subjected to internal pressure. Use is made of this internal pressure by having the walls of the plug thin and resilient enough to be forced outwardly by said pressure into a fluid-tight fit with the walls of the casing.

I have shown the valve stem 16' as formed integrally with the valve plug, which plug is provided with small holes 17 which connect its interior cavity with the chamber 18 between its upper end and the head of the chamber in the casing. The admission of the water under pressure to this chamber 18 serves to aid in balancing the valve, makes it turn more freely and assists in the operation. I have shown this plug valve as provided with a collar 19 around the lower end of its stem having a ball-race receiving balls which also fit in a similar ball-race in the plate or ring 20. Against the plate 20 bears the brass ring 21, between which and the follower 22 is placed the flexible packing 23, the gland-member 22 is drawn down by nuts 24 upon bolts 25 which extend through flanges of the gland 22. By this peculiar packing device I am enabled to balance the valve and at the same time prevent leakage of the water to the outside. This also enables the valve to be easily adjusted.

A fiber gasket 26 is placed between the cover-plate 27 and the top of the casing chamber, the parts being clamped by screw-bolts 28, which compress the gasket and seal the joint at this point. An annular oil chamber 29 is formed between the valve 4 and the stationary valve bushing, and into this chamber leads a tube 30 from an oil cup 31. Oil may thus be supplied to the exterior of the valve in any desirable amounts.

The advantages of my invention result from the use of the strainer at the entrance to the valve, from the water-admission holes in the top of the valve in combination with the packing, and from the oil chamber. The valve moves freely and easily, and may be quickly adjusted.

Variations may be made in the form and arrangement of the parts without departing from my invention.

I claim:—

1. In a fluid pressure valve, the combination of a casing having a valve socket provided in one end with a longitudinal inlet, a hollow turning plug working in the socket and provided in one end with a longitudinal inlet port in continuous communication with the inlet of the casing, a valve stem for the other end of the plug, there being a space between the valve stem end of the plug and the adjacent end of the casing, said end of the plug having an opening communicating from the interior of the plug to said space, whereby fluid pressure is admitted to said space and the plug thereby balanced, an antifriction bearing for the plug located in said space, and a packing for the valve stem, said packing engaging the antifriction bearing and capable of adjustment to take up wear on the bearing and plug, substantially as described.

2. In a fluid pressure valve, the combination of a valve casing provided with a valve socket having a longitudinal inlet in one end, a hollow turning plug working in the socket and provided in one end with a longitudinal inlet port in continuous communication

with the inlet of the casing, a valve stem for the other end of the plug, there being a space between the stem end of the plug and the adjacent end of the casing, said stem end of the plug having an opening communicating from the interior of the plug to said space, whereby fluid pressure is admitted to the space to balance the valve, an antifriction bearing for the plug in said space, a packing ring embracing the stem and engaging the antifriction bearing, an adjustable gland embracing the stem, and a flexible packing element interposed between the gland and the packing ring, substantially as described.

3. A valve comprising a casing having a valve socket and inlet and outlet ports, and a hollow turning plug working in the socket and provided with inlet and outlet ports for registration with the corresponding ports of the casing, the inlet ports being continuously registered, whereby the hollow plug is continuously under internal pressure, the walls of the plug being thin and having sufficient resiliency to be forced outwardly by the internal pressure into a fluid-tight fit with the walls of the valve socket, substantially as described.

4. A valve comprising a casing having a valve socket provided with a lateral outlet port and a terminal inlet port leading longitudinally inward, and a hollow turning plug working in the socket and provided with a lateral outlet port and a terminal inlet port continuously registering with the inlet port of the casing, whereby the plug is continuously under internal pressure, the walls of the plug being thin and resilient enough to be forced outwardly by the internal pressure into a fluid-tight fit with the walls of the socket, substantially as described.

In testimony whereof, I have hereunto set my hand.

HARRY WOODS.

Witnesses:

JOHN MILLER,
H. M. CORWIN.