

S. S. CASKEY.
 HYDRAULIC VALVE.
 APPLICATION FILED MAY 13, 1908.

920,268.

Patented May 4, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

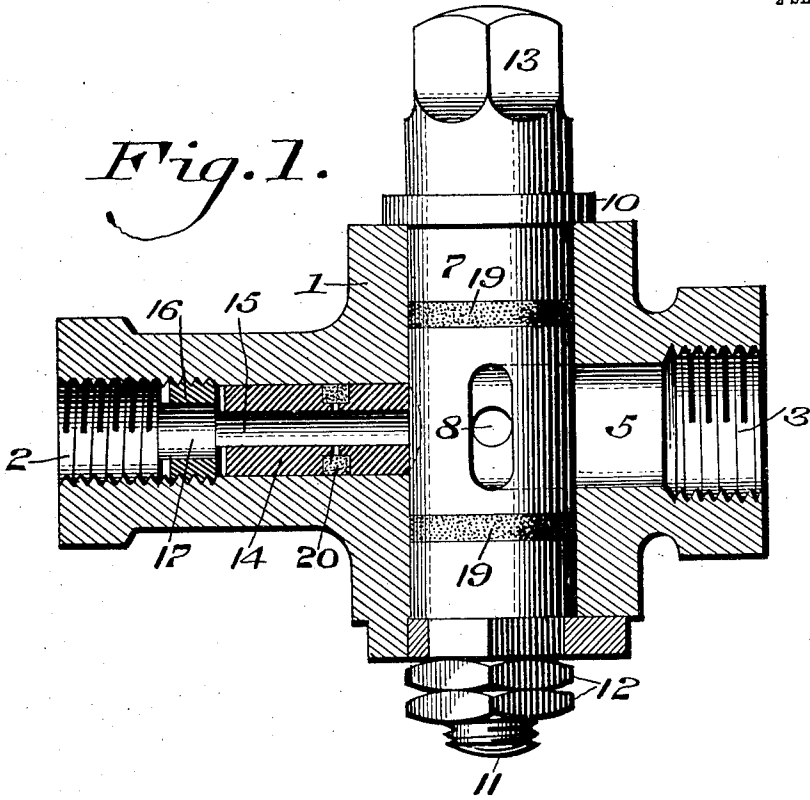
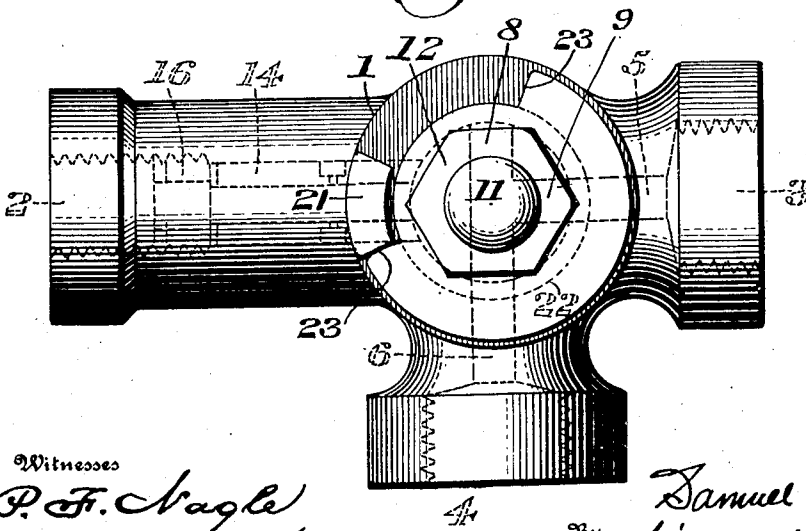


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

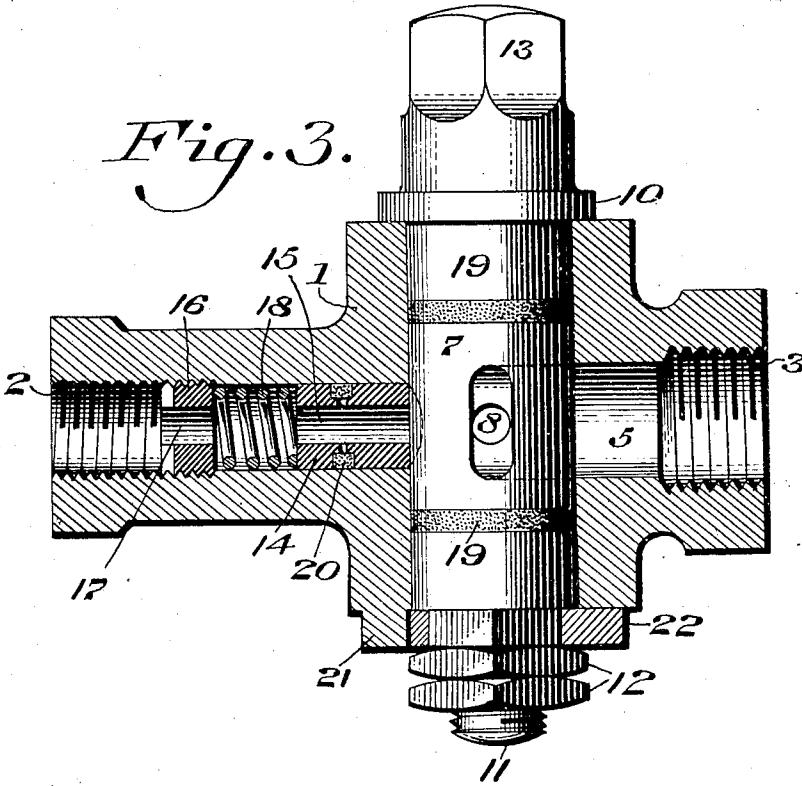
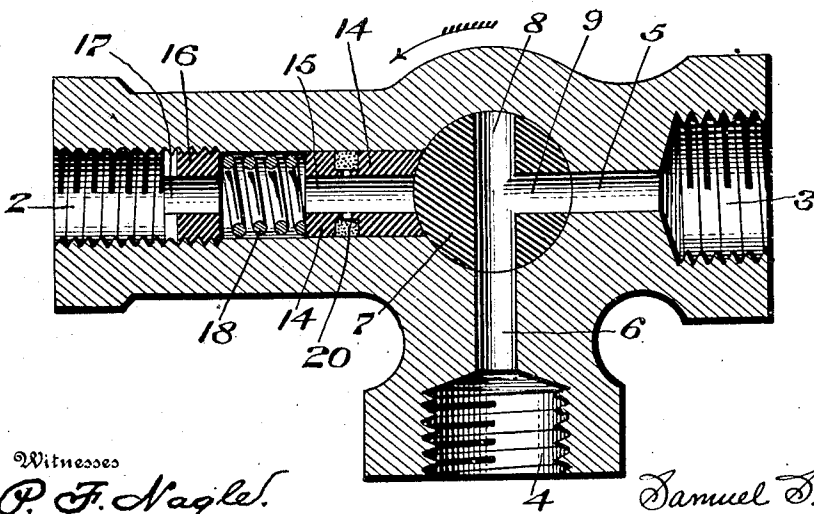


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC VALVE.

No. 920,268.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed May 13, 1908. Serial No. 432,736.

To all whom it may concern:

Be it known that I, SAMUEL S. CASKEY, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Hydraulic Valve, of which the following is a specification.

My invention relates to a new and useful valve which is adapted for use with steam or air, as a hydraulic or a blow-off valve, and consists in providing means whereby the valve becomes more effective as the pressure is increased.

It further consists of a sealing bushing which is adapted to prevent leakage around the plug.

It further consists of novel details of construction, all as will be hereinafter fully set forth.

Figure 1 represents a vertical sectional view of a valve embodying my invention. Fig. 2 represents a bottom plan view thereof. Fig. 3 represents a vertical sectional view showing a spring for assisting in retaining the sealing bushing in position. Fig. 4 represents a horizontal sectional view of the valve shown in Fig. 3.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings. It is well known among hydraulic engineers that the vital parts of hydraulic systems are the operative valves and stop valves and the expense of such systems is in the repairs that must be made on the valves aside from the fact that while all such valves are standing idle, they are wasting energy at high pressure, said waste returning through the exhaust pipe to the pump tank and it is further well known that with the present form of valves the grit which comes through the pipe even though the water be filtered, may prevent closure of the valve, thus permitting leakage and forming grooves in the valve, as will be evident. My invention is designed to overcome these defects and in the drawings, I have shown a construction which I have found in practice to operate successfully, but it will be evident that the arrangement of the parts may be varied and other instrumentalities may be employed which will come within the scope of my invention and I do not, therefore desire to be limited in every instance to the exact form as herein shown and described, but desire to make such changes as may be necessary.

1 designates the body of the valve having the threaded opening 2 at the pressure end which is adapted to be connected up with an accumulator, compressor or boiler depending upon the use desired and 3 is a threaded opening by which the valve is connected to the ram for hydraulic use, with the engine for steam and air and with a pipe which discharges to the atmosphere when the valve is used as a blow-off.

4 designates the exhaust opening which is connected with a pipe leading to any suitable point.

5 designates a bore in the valve body communicating with the threaded opening 3, and 6 designates a bore communicating with the exhaust 4.

7 designates a circular plug, the walls of which are straight as will thus be understood from Figs. 1 and 3, which is provided with a bore 8 and the branch 9 leading therefrom, said plug being rotatably mounted in a suitable opening in the body, the walls of which opening are circular to correspond with that of the plug.

10 designates a collar on the plug which abuts a suitable portion of the body 1 and said plug is provided with the threaded end 11 for the reception of the nuts 12 for locking the parts in position, said plug also having the squared end 13 for engagement by a wrench or other operating tool.

Movably mounted in a bore in the body 1 is the sealing bushing 14 the inner face of which is curved to correspond to the curvature of the wall of the plug 7 and with which the said bushing makes a ground joint connection, it being understood that the bushing is preferably of soft metal. A suitable bore 15 is provided in the bushing which corresponds to the bore 8 in the plug 7.

16 designates a retaining plug which is screwed or otherwise secured within the body 1 at a suitable point with respect to the bushing, it being noted that the plug in Fig. 1 is provided with a bore 17 which is larger than the bore 15 of the bushing 14, whereby it will be noted that the end of the bushing projects within the path of the incoming fluid as it passes through the bore 17 of the retaining plug 16 so that the bushing will be always forced tightly against the plug 7. In some instances, I may provide a spring 18 between the retaining plug 16 and the sealing bushing 14, said spring tending to assist in holding

the sealing bushing in proper position against the plug 7.

In Fig. 1, I have omitted the spring as it is not always necessary for the operation of the parts.

The operation of the valve will be readily apparent. When the plug is in the position shown in Fig. 4, the bore 8 is in communication with the exhaust bore 6 and the branch 9 is in communication with the bore 5 so that the valve is exhausting, it being noted that I preferably form the bore 5 and a part of the bore 8, as well as the branch 9 in the plug, elongated, in order that there will be a quick exhaust. When, however, it is desired to allow the passage of the fluid, the plug 7 is rotated in the direction indicated by the arrow in Fig. 4, bringing the bore 8 into line with the bore 15 and with the bore 5 so that a straight passage for the fluid is provided.

It will be noted that by this construction the incoming fluid is directed in a proper manner against the bushing 14 so as to tightly force the same always against the plug 7 so that no leakage can occur between the walls of the bushing 14 and the walls of the plug 7, since the pressure will tend to force the sealing bushing more firmly against the plug the greater the pressure and this action will be assisted by the spring 18 when the latter is used. In addition, as the bushing 14 wears, it being of softer material, it will still be moved up or forced into proper position and held against the plug 7 and the ground joint formed between the walls of the said bushing and plug will be so intimate as to prevent passage of any grit therebetween. If necessary, I may provide on the plug 7 the packing 19, which is preferably of leather or any suitable material, in order to prevent leaking of any back pressure while in the bushing I may provide a packing 20 which is of leather or any suitable material, which will prevent any leakage between the walls of the body 1 and the said bushing 14. Any suitable means may be employed for stopping the rotation of the plug so that the bores or passages will be in suitable position and in the drawings, I have shown a lug 21 on the body 1 and a washer 22 mounted to rotate with the plug 14 and having the shoulders 23 thereon which abut the lug 21, as best seen in Fig. 2, at the proper time, in order to locate the bores in suitable position. Attention is further directed to the fact that the parts of the valve can be removed without releasing the body portion from its suitable connection, this being more particularly shown in Fig. 3, wherein by removing the nuts 12 the plug 7 can be withdrawn from the body 1 after which the bushing 14 and spring 18 can also be withdrawn through the circular opening in the body which receives the plug 7. The advantages derived from

this will be evident to anyone. While I have shown in Fig. 1 the bushing 14 considerably longer than that shown in Fig. 3, it will of course be apparent that the bushing 14 in Fig. 1 can be made any suitable length in order to be removed in a similar manner as above described, it being only necessary to place the retaining plug 16 closer to the plug 17 than is shown in Fig. 1. It will be further apparent that while I have described the plug 7 as being rotated in the body 1, I may, if desired, or find it necessary, have the plug stationary and rotate the body 1 around the plug with the same effect as previously described, in which event flexible connections would be made for the body portion 1. It will be understood that in the claims while I have called for a rotatable plug, I desire it to be understood that either the body 1 or plug 7 may be rotated as may be required it simply being necessary to have relative rotation between the plug and the body.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a valve, a body having a circular opening, a rotatable cylindrical plug seated in said opening and contacting with the walls thereof, a sealing bushing abutting said plug and preventing leakage therebetween, and packing between the body and the bushing for preventing leakage therebetween.

2. In a valve, a body having a circular opening, a rotatable cylindrical plug seated in said opening and contacting with the walls thereof, a movable sealing bushing adapted to be held tightly against said plug by the pressure in the valve and packing between the body and the bushing, preventing leakage therebetween.

3. In a valve, a body having a bore there-through, and a circular opening therein, a rotatable cylindrical plug in said opening contacting with the walls thereof and having a bore therein and a branch leading therefrom, a bushing in the bore of said body adapted to abut said plug and having a bore adapted to register with the bore of said plug and packing between the body and the bushing preventing leakage therebetween.

4. In a valve, a body having a suitable bore and a circular opening, a cylindrical plug in said opening contacting with the walls thereof having a suitable bore and a branch, said body and plug being adapted for relative rotation, a sealing bushing in the bore of said body and abutting said plug, packing between the body and the bushing for preventing leakage and means for stopping the relative rotation of said body, and plug in order that the bore will be in proper position.

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