

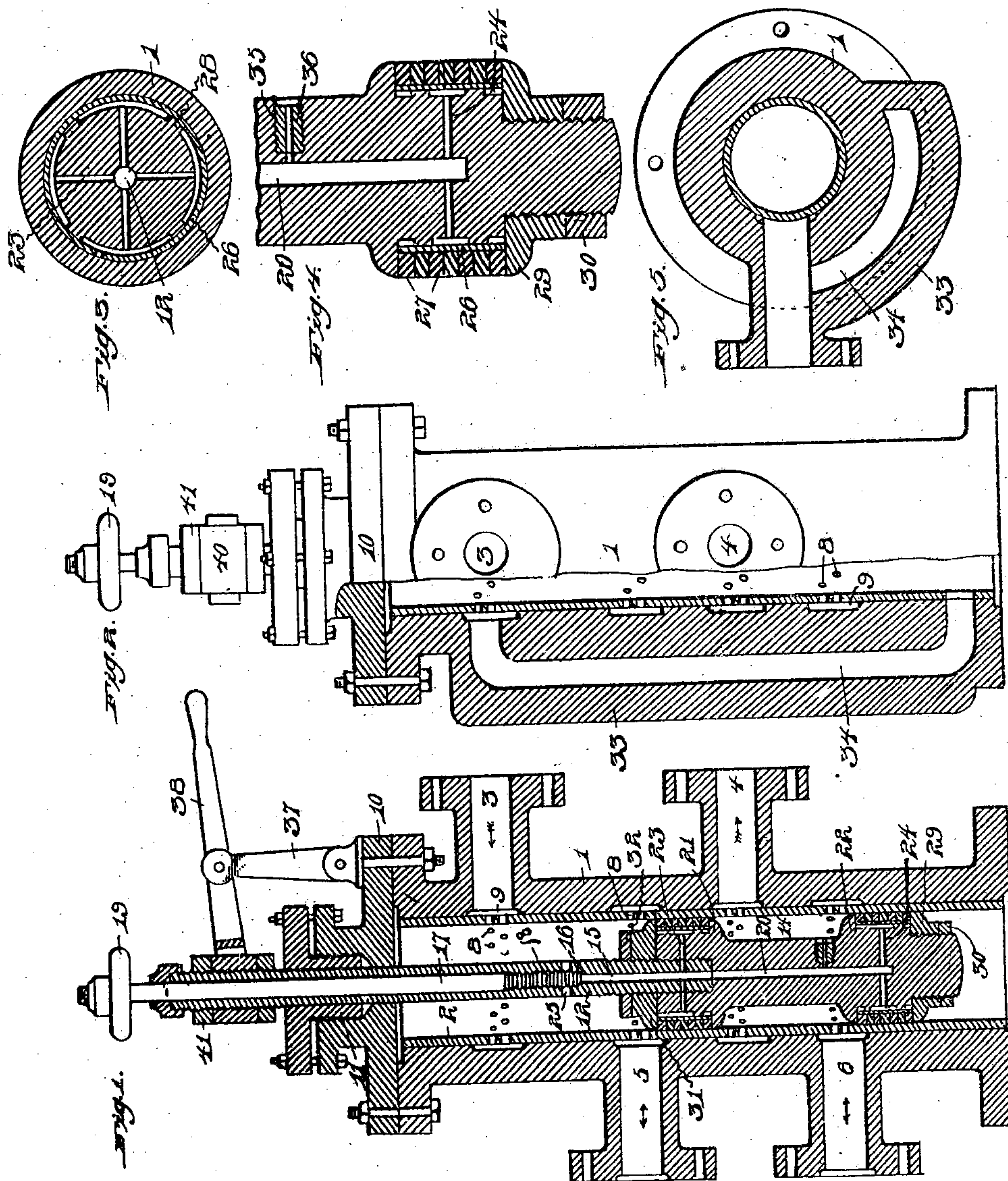
No. 681,076.

Patented Aug. 20, 1901.

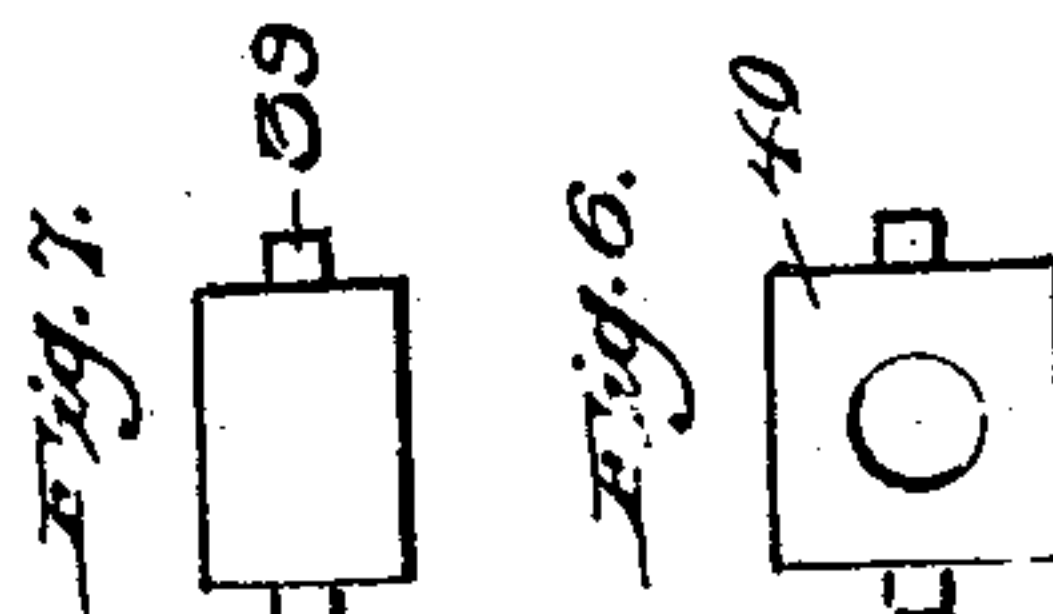
D. W. PORTER.  
HYDRAULIC VALVE FOR PRESSES.

(Application filed Jan. 17, 1901.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## HYDRAULIC VALVE FOR PRESSES.

SPECIFICATION forming part of Letters Patent No. 681,076, dated August 20, 1901.

Application filed January 17, 1901. Serial No. 43,605. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID W. PORTER, a citizen of the United States of America, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Valves for Presses, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in hydraulic valves for presses, and has for its object to simplify the construction of that class of valves ordinarily employed in connection with hydraulic  
15 presses, jacks, and such machinery.

The invention has for its further object to provide in connection with the valve of this character a balance piston-valve having packing-rings which are held expanded against  
20 the face of the barrel or cylinder by the pressure within the valve.

The invention further consists in the novel combination and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claims hereunto appended.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and  
30 wherein like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a vertical sectional view of my improved valve. Fig. 2 is a side elevation, partly in vertical section. Fig. 3 is a horizontal sectional view of the same. Fig. 4 is a vertical sectional view of a part of the valve. Fig. 5 is a horizontal sectional view of the valve-casing. Figs. 6 and 7 are detail plan  
40 and side elevations, respectively, of the yoke to which the controlling-lever is attached.

Referring to the drawings by reference-numerals, 1 indicates the body or shell of the valve, provided with ports 3, 4, 5, and 6, that  
45 extend through glands arranged in pairs on opposite sides of the shell or casing. Arranged within the chamber of the casing 1 is a bushing or cylinder 2, preferably constructed of brass or equivalent metal and  
50 which extends the entire length of the said shell or casing. This cylinder or bushing is provided with circumferentially-arranged openings 8, two rows of which are preferably provided, and the openings in one row

are staggered with respect to those of the 55 other row in order that the bushing or cylinder be not weakened to any great extent by providing the same with these openings. The casing or shell 1 is provided with circumferential grooves 9 on its one face at each 60 of the ports 3, 4, 5, and 6 in order that the water at this point may flow entirely around the bushing or cylinder and through all of the openings 8 therein. The casing or shell 1 and bushing or cylinder 2 are closed at the 65 upper end by means of a cap-plate 10, having a stuffing-box 11, through which and into the cylinder extends a stem 12, threaded at its lower end into the valve-body 14. The stem 12 is provided with an opening ex- 70 tending entirely the length of the same, the lower portion of this opening 15 being of less diameter than in the upper part of the stem to form a valve-seat 16, and in the larger diameter opening of the stem is arranged a 75 rod 17, having a thread 18 on its lower end to operate in the threaded portion of the stem, the lower end of the rod being adapted to seat against the valve-seat 16. The rod 17 is provided on its upper end with a hand- 80 wheel 19 for operating the same. The valve-body 14 is provided with a central bore 20, which registers with the bore 15 in the stem 12. The valve-body 14 carries valve-heads 21 22, which are each circumferentially 85 grooved, and in the upper valve-head 21 lateral ports 23 connect the opening 15 with the circumferential groove in this valve-head, while in the lower valve-head like lateral ports 24 connect the central bore 20 90 with the groove in this lower valve-head. When the lower end of the rod 17 is unseated from the valve-seat 16, the water is permitted to flow into the bore 15, the bore 20 through openings 25 into the rod 12, and 95 through the lateral ports 23 24 into the circumferential grooves in the piston-head. Arranged within each of these circumferential grooves is a split ring 26, and surrounding this split ring is a series of gaskets or wash- 100 ers 27, having plain faces which are forced outwardly against the working barrel 2 by the pressure of the water behind the split ring 26. In order to form the chamber within the grooves to receive the water, a series of lugs 105 28 are provided on the valve-heads, against which the split ring rests. The split ring and packing are secured in position on the lower



valve-head by a collar 29 and nut 30, threaded on the lower end of the valve-body, and the packing and split ring on the upper valve-head are secured in position by a collar 31 and nut 32, threaded upon the stem 12. In order to balance the valve, the casing or shell is provided on one side with an enlargement or bushing 33, which is provided with a vertical by-pass 34, which by-pass at its upper end communicates with the chamber above the valve and at its lower end communicates with the chamber below the valve, thus equalizing the pressure above and below said valve. Should the pressure upon the packing become too great, so as to prevent the operation of the valve, I provide a means for draining the said valve, which consists in providing the valve-body, preferably at a point directly above the lower valve-head, with a threaded opening 35, in which a plug 36 is threaded, and is provided with a small orifice leading through into the bore 20 of the valve-body. When the rod 9 is screwed down, so as to engage the lower end of the same upon the seat 16, the water within the valve-body will drain out through the small orifice, thus readily relieving the pressure upon the packing and permitting the operation of the valve.

It will be evident that the closing of the ports 25 will, by allowing the valve to drain, relieve the pressure on the valves and permit the leather rings 27 to contract and the valves to work freely.

Mounted upon the cap 10 is a standard 37 for supporting the operating-lever 38, the latter having a bifurcated end to engage with the pins 39, carried on opposite sides of the nut or yoke 40, which is mounted on the stem 12 and held by nuts 41, threaded on said stem one above and one below the yoke.

The valve, as shown in Fig. 1, is in position to receive the pressure through port 5 and is discharging through ports 6 and 4. By depressing the operating-lever 38 it will move the valve upwardly above the ports 5 and 6, admitting pressure through port 6 and draining through ports 5 and 4. The port 3 is in communication with the water-supply.

It will be observed that by the construction of packing and the admitting of the pressure within the valve-heads back of this packing the pressure may be controlled or regulated at will by the regulating-valve carried on the rod 17, this valve when opened allowing the water to pass in back of the rings and force the same outwardly against the working barrel and when closed admitting the water to drain until the desired pressure has been obtained.

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

1. In combination with a working barrel or cylinder provided with rows of openings, a valve-body arranged therein and provided with a valve-head near each end, a split ring arranged in each valve-head, a packing ar-

ranged in each of said valve-heads around the split rings, means for admitting pressure from the interior of the cylinder to the back of the split rings, a stem connected to said valve-body, and means operative within the stem for regulating the pressure on the packing-rings, substantially as described.

2. In combination with the valve-casing having inlet and discharge ports, of a working barrel or cylinder within the valve-casing and provided with ports opposite the inlet and discharge ports of the valve-casing, a by-pass arranged within the valve-casing and communicating with the interior of the working barrel or cylinder above and below the valve-body, a series of leather packing-rings arranged upon the valve-body, means for admitting the pressure through the valve-body to the back of said rings, a drain-port in the valve-body for relieving the pressure on said rings, and means connected to the valve-body for operating the same, substantially as described.

3. In combination, a valve-casing having inlet and discharge ports, a working barrel or cylinder within the valve-casing and provided with ports opposite the inlet and discharge ports of the valve-casing, a valve-body within the working barrel or cylinder with a valve-head on each end, and a by-pass arranged within the valve-casing and communicating with the interior of the working barrel at each end of the valve-body, a hollow stem connected to the valve-body and provided with inlet-ports extending through the walls thereof, a valve-rod threaded into said stem for opening and closing said ports, a central port within the valve-body communicating with the hollow stem, lateral ports in the valve-heads communicating with the central port in the valve-body, a split ring arranged in each valve-head, a series of flexible packing-rings arranged on said split rings, and means connected to the hollow stem for operating the valve-body, substantially as described.

4. In combination, a working barrel or cylinder provided with openings, a valve-body arranged therein and provided with a valve-head near each end, a split ring arranged in each valve-head, flexible packing-rings on said split rings, means for admitting pressure from the interior of the cylinder to the back of the split rings to expand the flexible packing-rings, a drain-port in the valve-body for relieving said pressure, a stem connected to said valve-body, and means operative within the stem for regulating the pressure on the packing-rings, substantially as described.

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

DAVID W. PORTER.

Witnesses:

JOHN NOLAND,  
E. E. POTTER.