

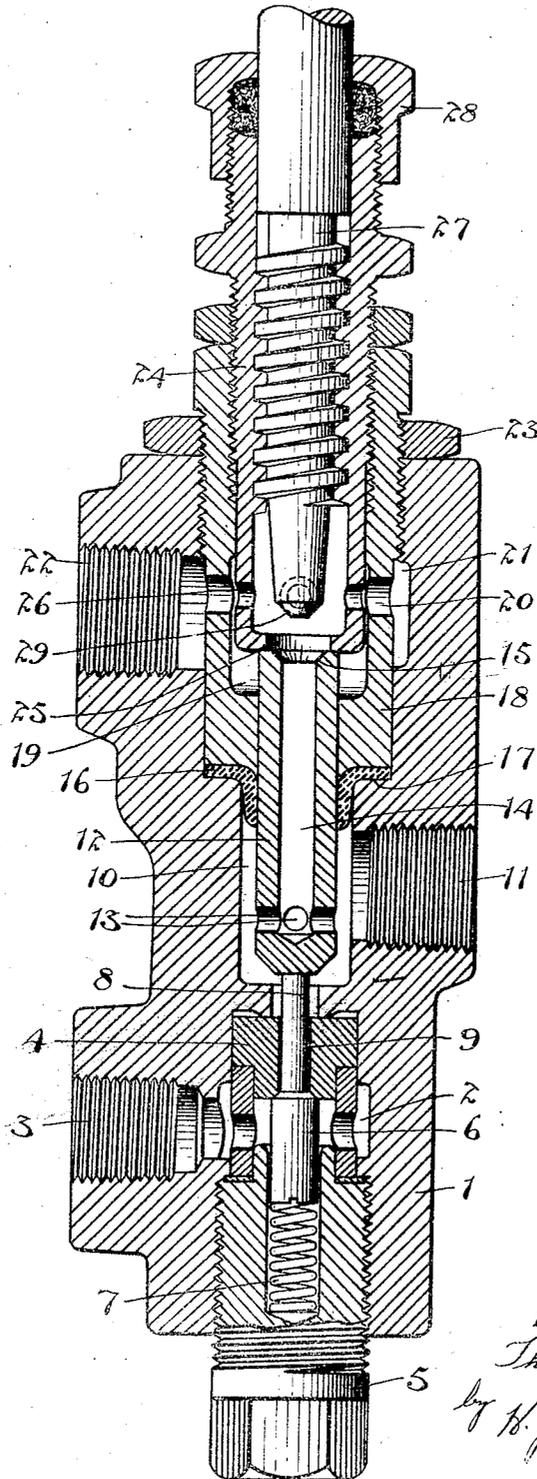
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T. B. JONES

OPERATING VALVE FOR HYDRAULIC PRESSES

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Inventor  
Thomas B. Jones  
by H. S. Dennison  
Atty.

# UNITED STATES PATENT OFFICE.

THOMAS B. JONES, OF TORONTO, ONTARIO, CANADA.

OPERATING VALVE FOR HYDRAULIC PRESSES.

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*To all whom it may concern:*

Be it known that I, THOMAS B. JONES, a subject of the King of Great Britain, and resident of the city of Toronto, county of York, Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in an Operating Valve for Hydraulic Presses, as described in the following specification and illustrated in the accompanying drawings, that form part of the same.

The principal objects of this invention are, to overcome the difficulties of maintenance and adjustment of control valves for hydraulic presses, thereby obviating the necessity of shutting down the press and dismantling the valve for adjustment.

In the present forms of control valves for hydraulic presses the construction is such that when the valves get out of adjustment and leak they require to be taken down to have the intermediate plunger refitted and the principal feature of this invention consists in the novel construction of the main packing member between the pressure chamber and the exhaust and of the means for limiting the movement of the plunger between the main valve and the operating member, whereby said limiting means may be adjusted independently of the adjustment of the hydraulic packing.

The drawing is a longitudinal mid-sectional view of my improved valve.

The body 1 of the valve is formed with a cylindrical chamber 2 in the lower end having an inlet opening 3 from the side.

Within the chamber 2 is arranged a valve seat 4 which is held in place by the threaded plug 5 in the bottom end.

The main valve 6 is held to its seat by a coil spring 7 and said valve is formed with a stem 8 which extends loosely through the opening 9 leading from the seat 4.

The upper end of the valve stem projects into a cylindrical chamber 10 which forms the discharge chamber, said chamber having an opening 11 therefrom through which the pressure fluid passes to the press. Within this chamber is arranged the intermediate plunger 12 which is spaced from the inner walls of the chamber 10 and has a plurality of openings 13 through the side wall leading to a central opening 14 which extends to the top thereof and a tapered seat 15 is formed at the top end.

The bottom end of the plunger 12 engages the top end of the valve stem 8.

The upper end of the chamber 10 is closed by a hydraulic packing 16 which surrounds the plunger 12 intermediate of its length and is held against a shoulder 17 at the upper end of the chamber 10 by a cylindrical member 18 which is threaded into the upper end of the body 1.

The plunger 12 is slidably supported in the lower end of the member 18 and said member 18 is provided with a plurality of openings 20 leading from the chamber 19 to an annular passage 21 surrounding same and communicating with the threaded opening 22 extending through the side wall of the body.

The threaded member 18 may be tightened down against the hydraulic packing 16 as desired and is held securely by a lock nut 23.

The upper end of the chamber 19 formed in the member 18 is threaded to receive the member 24, the inner end of which is formed with a circular opening 25 of lesser diameter than the upper end of the plunger 12 so that the plunger will engage the end of the said member which forms a stop for same.

The member 24 is provided with a plurality of openings 26 in the side wall to allow a free flow of the pressure fluid. The inner wall of the member 24 is threaded to receive the threaded valve stem 27 which is packed at its upper end by a gland 28 and is provided with a suitable means, not shown, for turning same in its threaded support.

The inner end of the valve stem 27 is formed with a tapered seat 29 which is adapted to engage the seat 15 in the upper end of the plunger 12.

In the operation of this valve the threaded operating valve stem 27 is turned in the member 24 until the tapered end engages the seat 15 in the plunger 12. Further movement then forces the plunger 12 inwardly to push the main valve 6 from its seat. This allows the inflow of the pressure fluid past the valve 6 to the chamber 10 from whence it flows to operate the press.

Upon the operating valve stem 27 being withdrawn from contact with the plunger 12 the pressure of the plunger against the main valve 6 is released and the valve closes.

Coincidentally the central opening 14 through the plunger 12 is opened so that the pressure fluid flows back into the chamber 10 and through the hollow plunger 12, escaping into the exhaust passage and out through the openings described.

The plunger 12 must be engaged at the upper end coincident with the closing of the main valve upon its seat, otherwise the valve will hammer and as the hydraulic packing requires adjustment from time to time and the member 18 is tightened down, the adjustment of the plunger is maintained by adjusting the member 24 outwardly a corresponding distance to the distance that the member 18 is moved inward. This adjustable feature is the vital element of the invention, for, if the means for determining the position of the plunger 12 is rigid with the member 18, then upon the movement of the member 18 inwardly, the plunger 12 will open the main valve and cause it to leak and in the known constructions it is then necessary to dismantle the valve removing the plunger 12 and grind or otherwise remove a portion therefrom and as the member is hidden when in operation, the amount to remove therefrom is not outwardly evident, consequently the adjustment requires great skill on the part of the adjuster.

With the present construction it is merely necessary to slacken away the inner member 24 in accordance with the amount the member 18 is tightened. This adjustment can be made in a few moments and there is no need of shutting down the press or removing it from action in order to obtain the necessary adjustment.

The improved construction is extremely simple but yet is very effective.

What I claim as my invention is—

1. In a hydraulic valve, the combination with the main valve, intermediate plunger, adjustable packing member encircling said plunger, and the operating valve stem, of a stop for said intermediate plunger adjustable independent of said packing member.

2. A hydraulic valve, comprising, a body, a main valve, an intermediate plunger, a packing surrounding said plunger, a member threaded in the body and guiding said plunger and adjusting said packing, a member adjustably arranged within the aforesaid adjustable member and forming a stop for the intermediate plunger, and a manually operable valve threaded in the latter adjustable member.

3. A hydraulic valve, comprising, a body having an inlet chamber, a discharge chamber and a return chamber, a main valve arranged in the inlet chamber, a hollow plunger arranged in the discharge chamber and engaging the main valve and extending into the return chamber, an adjustable guide for said plunger extending through the return chamber and separating the discharge chamber from the return chamber, a hydraulic packing secured by said adjustable guide around the plunger, a sleeve threaded into said adjustable guide and having a shouldered open end engaging the end of the plunger and provided with an internal thread, and a threaded spindle arranged within said sleeve and having a valve end adapted to extend through the end of said sleeve and to engage the plunger.

THOMAS B. JONES.