

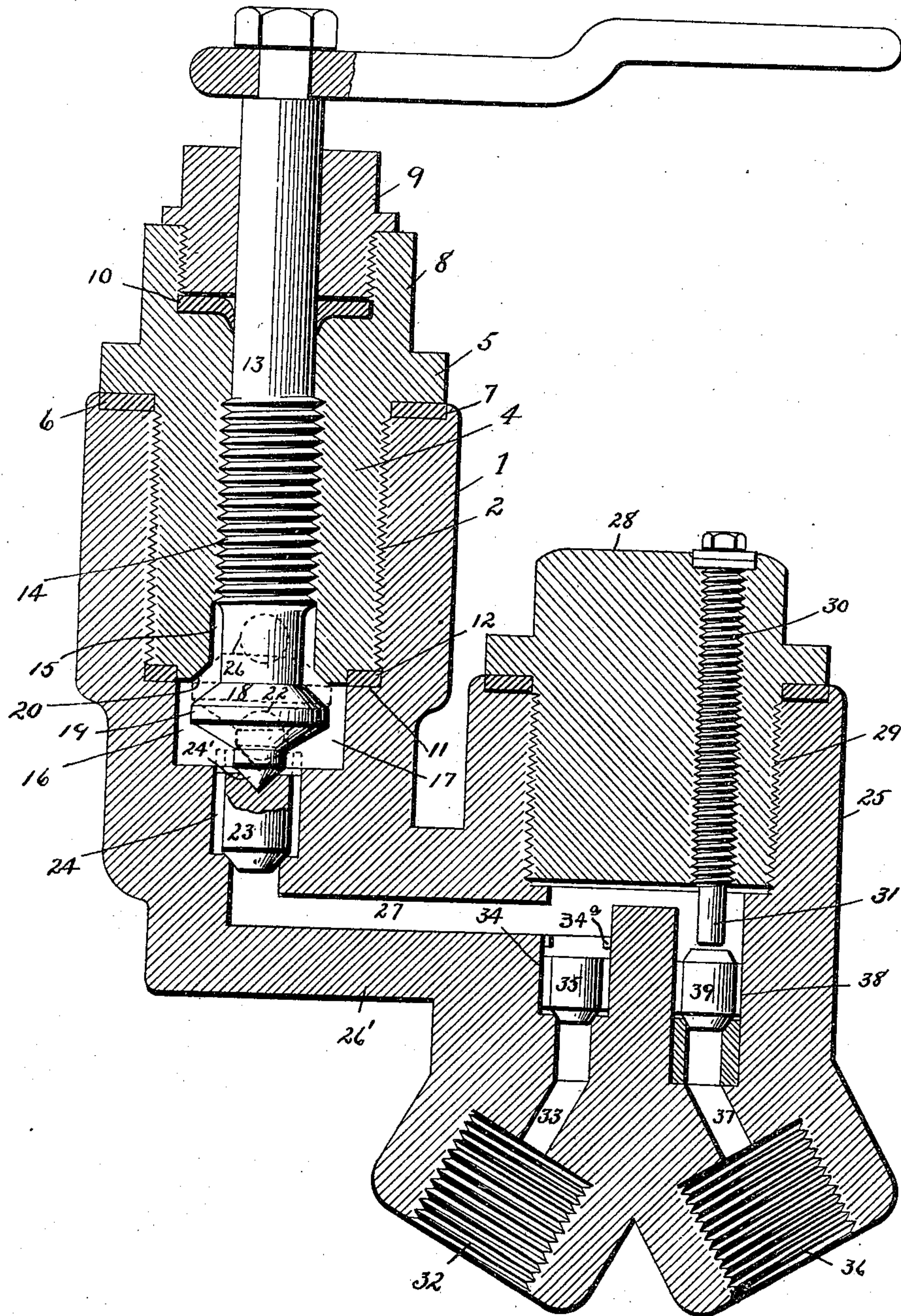
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F. WOLFENDEN.
HYDRAULIC VALVE.

(Application filed June 26, 1897.)

(No Model.)



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HYDRAULIC VALVE.

SPECIFICATION forming part of Letters Patent No. 617,667, dated January 10, 1899.

Application filed June 28, 1897. Serial No. 642,474. (No model.)

To all whom it may concern:

Be it known that I, FRANK WOLFENDEN, of Greenville, in the county of Washington and State of Mississippi, have invented certain
5 new and useful Improvements in Hydraulic Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and
10 use the same.

This invention relates to new and useful improvements in hydraulic valves, chiefly useful in connection with cotton-seed presses, but applicable of course to other uses as well.

15 In the practical employment of cotton-seed presses which extract the oil from the seed it is desirable and important that the seed placed in the press-boxes shall be quickly brought to substantially that state of compactness or that
20 degree of pressure where the oil begins to exude from the seed for the sake of economy of time in the operation. When the seed is brought to substantially this condition, however, it has been found that a continued quick
25 and forceful action of the press-plungers abuses and disrupts or damages the press-cloths, which are quite costly, rendering unnecessarily-repeated renewals thereof essential. Therefore it is desirable that the latter
30 part of the pressing operation to extract the oil from the seed shall be effected slowly to avoid such violent and injurious action on the press-cloths.

It is the object of my invention to provide
35 a new and improved valve for effecting this manner of operation and which shall be simple in construction and require the minimum of attention in action; and to this end the invention consists in a valve having the novel
40 construction, arrangement, and operation of parts hereinafter described and claimed, reference being had to the accompanying drawing, wherein the figure is a central vertical sectional view of a valve embodying my in-
45 vention, the valve-stem whereof is shown in its lowered position in full lines and in its raised position in dotted lines.

Referring to the drawing, the numeral 1 indicates a valve-casing screw-threaded inter-
50 nally, as indicated by the numeral 2, for the reception of an externally-screw-threaded plug 4, which is provided immediately above

the casing with a flange 5, seated upon a washer 6, retained in an annular recess 7 in the casing. This plug is provided with a
55 square or hexagonal portion 8, recessed and internally screw-threaded for the reception of a plug 9, which is seated upon a washer 10. Seated upon the annular shoulder 11, near the central portion of the casing, is a washer
60 12, which is adapted to serve as a packing between the plug 2 and the casing when the plug is in its normal position within the casing.

Extending vertically through the plugs 4
65 and 9 is a valve-stem 13, provided with an externally-screw-threaded portion 14, which is adapted to enter the internal screw-threads in the center of the plug 2.

The numeral 15 indicates a cavity formed
70 in the under side of the plug 2 and which communicates with an annular cavity 16 in the lower portion of the casing 1. These cavities form a chamber 17, in which works the lower end 18 of the valve-stem 13.

The numeral 19 indicates an annular shoulder which is formed near the lower end of the valve-stem and is adapted to bear against the seat 20 at the bottom of the plug 4 to close
75 communication between the cavities 15 and 16 when the valve-stem is lifted.

The numeral 26 indicates an exhaust-passage from the cylinder of the press, leading from the cavity 15, forming the upper portion of the chamber 17, and the numeral 22 in-
80 dicates a supply or feed passage leading to the press-cylinder from the cavity 16, forming the lower portion of said chamber and through which oil or water is forced by the high and low pressure pumps.

The numeral 23 indicates a check-valve seated in a recess 24 in the lower portion of the casing 1 and adapted to be held therein by a cone-shaped point 24' at the lower end of the valve-stem.

The numeral 25 indicates a section of the valve-casing which is connected to the casing 1 by a short arm 26', provided centrally with a duct 27 common to both the high and low pressure pumps, as will be referred to
85 hereinafter.

The numeral 28 indicates an externally-screw-threaded plug which is adapted to enter the internally-screw-threaded recess 29

in the section 25 of the valve-casing, and contains the screw-threaded rod 30, having at its lower end an extension 31. This rod 30 is adapted to be adjusted so that its end 31 will limit the movement of the high-pressure check-valve hereinafter referred to, and thus control the maximum supply of high pressure, as will be obvious.

The numeral 32 indicates an internally-screw-threaded coupling-socket in the lower portion of the section 25 of the valve-casing to receive a screw-threaded pipe leading from the low-pressure engine.

The numeral 33 indicates a duct communicating with and extending upwardly from the socket and entering a pocket 34, in which is seated a check-valve 35, confined therein by stops 34'. In practice the valve 35 is seated in the pocket 34, and then the stops are properly secured in place. This can be done in any way known to those skilled in mechanics. The particular means of securing the stops form no part of my invention.

The numeral 36 indicates an internally-screw-threaded coupling-socket, which is adapted to receive the end of a pipe leading from the high-pressure engine and from which a duct or passage 37 leads to the pocket 38, in which is seated a check-valve 39, the upward movement of which is regulated by the screw-threaded rod 30, said rod being adjusted in the plug 28 so as to bring its end 31 into some selected position relative to the check-valve 39. It will be seen, therefore, that the check-valve cannot leave its seat more than a predetermined distance, controlled by the adjusted position of the rod 30, and that thereby the maximum supply of high pressure is controllable.

The operation of my improved valve is as follows: The high and low pressure pumps both being in operation and in communication with the common duct 27, the valve-stem 13 is operated, lifting the point 24' from the top of the valve 23, leaving said valve free to rise, and at the same time closing against its seat 20, cutting out the exhaust-passage 26 and compelling the oil, water, or other medium to pass to the press-cylinder through the feed-passage 22. Thus the water and oil from both the low-pressure and high-pressure engines go into the duct 27, traverse the same, lift the valve 23, and together pass by way of the feed-passage 22 to the cylinder of the press. Their combined force quickly reduces or compacts the seed into substantially that condition where the oil begins to exude from the seed. It would be injurious, as before stated, to permit the continued quick operation of the plungers under the impulse of the combined force of the high and low pressure engines, because the press-cloths would be injured by the violent action of the plungers, as hereinbefore stated.

According to my invention and the operation of my improved valve, the pressure of the combined high and low pressure engines

soon establishes a back pressure, which fills the duct 27 and overbalances the low pressure, whereupon the check-valve 35 is automatically forced to its seat by the overbalancing pressure in the duct 27 and cuts out the supply of low pressure, leaving the high pressure to slowly continue the pressing operation and avoiding the injurious and violent action of the plungers on the press-cloths.

After the cotton-seed has been pressed to the desired degree the valve-stem 13 is turned to the position shown in full lines in the drawing, closing communication between the duct 27 and the press and simultaneously establishing communication between the feed-passage 22 and the exhaust-passage 26, whereupon the oil or water will exhaust through the latter.

It will be seen that according to my invention and the operation of my improved valve the supply of pressure to the press from both the high and low pressure engines is started and cut off by a single manually-operated valve and that this valve also serves to simultaneously establish and cut off communication between the press and the exhaust-passage, and that, furthermore, both the high and low pressure power is initially employed during a portion of the operation of pressing and that the low-pressure power is automatically cut out by the overbalancing high pressure when it has, in connection with the high pressure, served its purpose.

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

1. In a hydraulic valve for presses, the combination with a casing having valved passages communicating with high and low pressure engines, the valve of the low-pressure passage being automatic and adapted to be closed by the high-pressure fluid, and a chamber provided with press supply and exhaust passages, of a valve in said casing arranged to simultaneously start the supply from both the high and low pressure engines and control said supply and exhaust passages, substantially as described.

2. In a hydraulic valve for presses, the combination with a casing, valved high and low pressure passages communicating therewith, the valve of the low-pressure passage being automatic and arranged to be closed by the high pressure, said casing also having press supply and exhaust passages, of a single valve arranged to control said supply and exhaust passages and to also simultaneously permit and cut off the supply of fluid to the press-cylinder from the high and low pressure engines, substantially as described.

3. In a hydraulic valve for presses, the combination of a casing having passages communicating with high and low pressure engines, the low-pressure passage being provided with an automatic valve, whereby the valve of the low-pressure passage will be closed by the high pressure, said casing also having a cham-

ber provided with press supply and exhaust passages, and a single valve arranged in said casing between the high and low pressure passages and the supply and exhaust passages 5 and serving to control said passages and to also simultaneously permit and cut off the supply of high and low pressure to the press-cylinder, substantially as described.

4. In a hydraulic valve for presses, the combination with a casing having passages communicating with high and low pressure engines, an automatic valve in the low-pressure passage, whereby the valve of the low-pressure passage is automatically operated by the 15 high pressure to cut off the supply of low pressure, said casing also having press supply and exhaust passages, and a duct from the high and low pressure passages to the press-supply passage, and a single valve arranged 20 in said casing to control the press supply and exhaust passages and to also simultaneously open and close the duct from the high and low pressure passages, substantially as described.

5. In a hydraulic valve for presses, the combination of a casing having passages communicating with high and low pressure engines, 25 an automatic valve in the low-pressure passage and a throttled valve in the high-pressure passage, the valve of the low-pressure passage adapted to be closed by the high pressure, 30 said casing also having a chamber provided with press supply and exhaust passages and a single valve arranged in said casing between the high and low pressure passages and the press-supply passage and serving to control 35 said supply and exhaust passages and to also simultaneously permit and cut off the supply of high and low pressure to the press-cylinder, substantially as described.

In testimony whereof I have signed this 40 specification in the presence of two subscribing witnesses.

FRANK WOLFENDEN.

Witnesses:

HENRY CUTTENDEN,
GEO. B. ALEXANDER.