

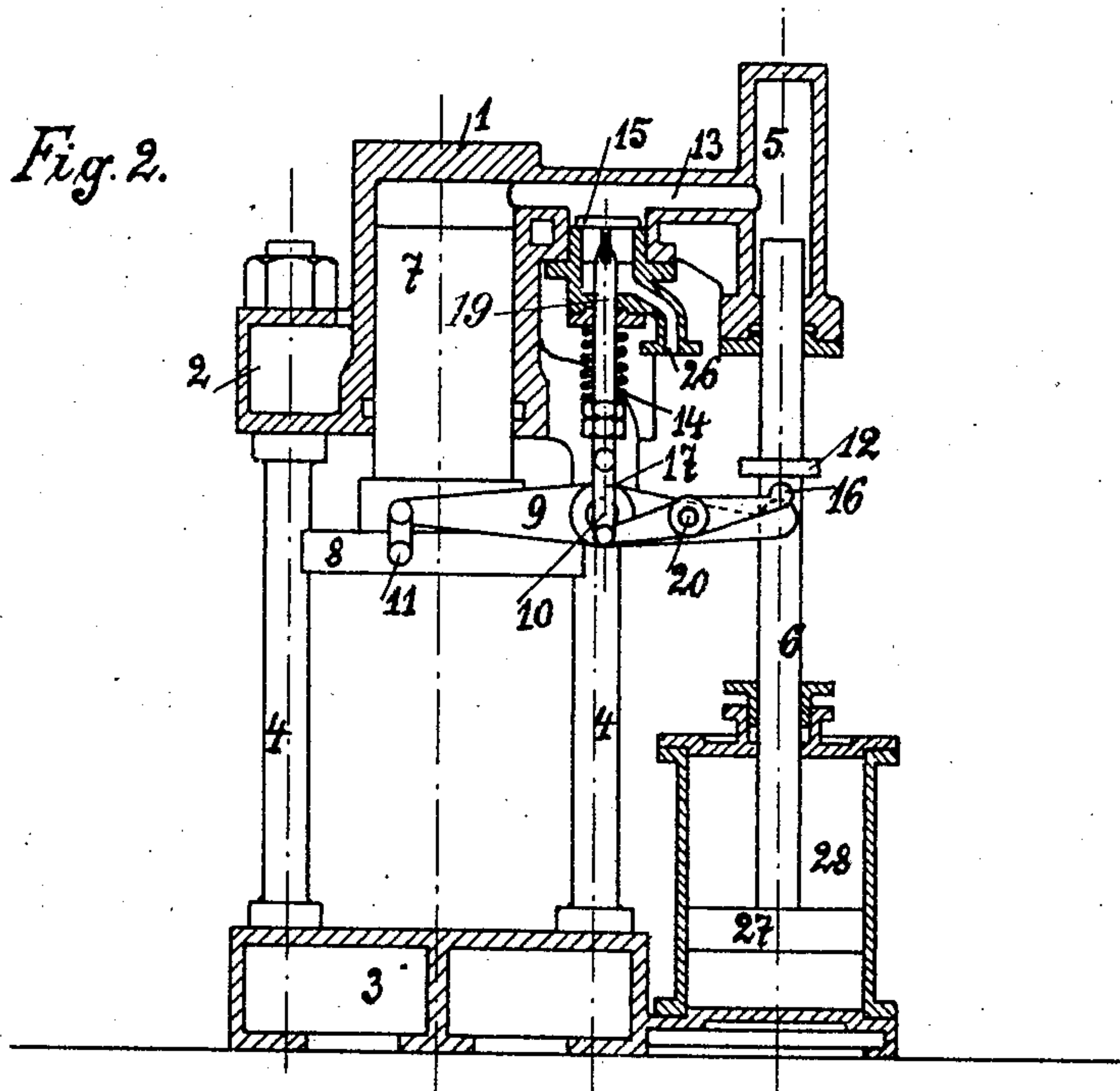
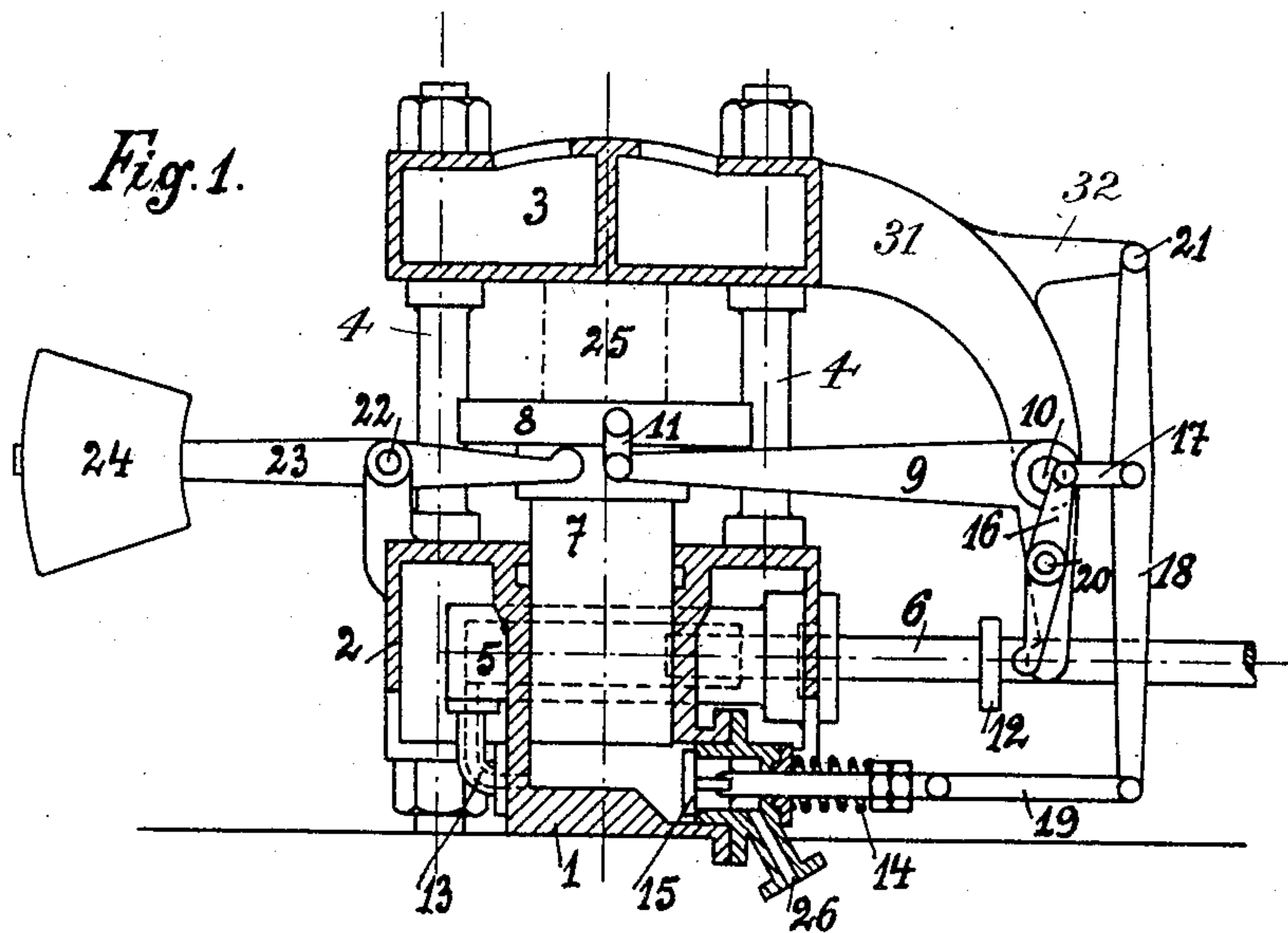
No. 777,975.

PATENTED DEC. 20, 1904.

O. PHILIPP.
HYDRAULIC PRESS.

APPLICATION FILED APR. 19, 1904.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

OTTO PHILIPP, OF DRESDEN, GERMANY, ASSIGNOR TO ELEKTROGRAVÜRE, GESELLSCHAFT MIT BESCHRÄNKTER HAFTUNG, OF LIEPSIC-SELLER-HAUSEN, GERMANY.

HYDRAULIC PRESS.

SPECIFICATION forming part of Letters Patent No. 777,975, dated December 20, 1904.

Application filed April 19, 1904. Serial No. 203,846.

To all whom it may concern:

Be it known that I, OTTO PHILIPP, a citizen of Germany, residing at Dresden, Germany, have invented new and useful Improvements in Hydraulic Presses, of which the following is a specification.

This invention relates to a hydraulic press operated by a pressure-spindle and of the class in which the transmission of power from the spindle to the piston takes place after the platen has ceased to run light.

By the present invention the pressure-spindle is separated from the piston, which is frequently desirable for constructive reasons.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of my improved hydraulic press; and Fig. 2 is a similar view of a modification.

The pressure-cylinder 1 is secured to the base 2 and is either integral therewith or formed of a separate piece rigidly connected thereto. The fixed platen 3 is arranged above the base and is supported by posts 4. The cylinder 1 is engaged by the pressure-piston 7, to which is secured the movable platen 8. The working cylinder 5 for the pressure-spindle 6 is arranged at right angles to the line of pressure. A first lever 9 is adapted to transmit the motion from the pressure-spindle 6 to the pressure-piston 7 during its return stroke. The lever 9 is elbow-shaped and is fulcrumed at 10 to an arm 31 of platen 3. The horizontal arm of lever 9 is by a link 11 connected to the movable platen 8, and consequently to the piston 7, while the vertical arm of lever 9 is adapted to contact at times with a collar 12 of spindle 6.

The cylinders 1 and 5 are connected with each other by a duct 13, so that the liquid may freely flow from one cylinder into the other. The water is admitted from a suitable reservoir or source of water - supply (not shown) by a pipe 26. This pipe is controlled by a valve 15, normally closed by spring 14. The stem 19 of valve 15 is pivoted to the lower end of a lever 18, fulcrumed at its upper end 21 to a fixed support 32. To the lever 18 is pivoted one end of a link 17, the other end of

which is pivoted to the upper end of a second lever 16, fulcrumed at 20 to the upright arm of elbow-lever 9. The link 17 is arranged at the same elevation as fulcrum 10 of lever 9, and its length is such that normally the lower end of lever 16 is slightly in advance of lower end of lever 9, as indicated in the drawings.

The platen 8 is engaged by a lever 23, fulcrumed at 22 and carrying a counterweight 24, which tends to raise the platen, together with the piston 7.

The operation is as follows: In its extreme outward position the spindle 6 by collar 12 and elbow-lever 9 holds the piston 7 in its lowermost position. In this position the lower end of lever 16 is turned to the right by collar 12 and the valve 15 is opened. Upon advancing spindle 6 the collar 12 will be moved to the left and permit the lever 9 to be turned. Thus the weight 24 will be free to raise the platen 8 and piston 7 as long as the machine runs light or, in other words, until the work-piece 25, resting on platen 8, contacts with platen 3. During this movement the lower ends of levers 9 and 16 will remain in contact with and follow collar 12. The valve 15 will meanwhile remain open against action of spring 14, so that water may continue to enter cylinder 1 through pipe 26. As soon as the work-piece 25 contacts with the platen 3 the piston 7, with its platen 8, can no longer follow the movement of the spindle. The latter, therefore, advances independently and the collar 12 will move away from lever 9. The lever 16, however, will follow the collar 12 by the action of spring 14 until the valve 15 is closed. The further advance of spindle 6 will now move the collar 12 away from both levers 9 and 16, the parts being then in the position shown in the drawings. During this movement the water will be displaced from cylinder 5 and forced into cylinder 1 through duct 13, so that the piston 7 is forced upward in a ratio depending upon the relative cross-sections of piston 7 and spindle 6. While this action takes place the lever 9 will be tilted; but its movement will not influence valve 15, owing to the position of link

17 opposite fulcrum 10. Upon the return movement of the spindle 6 the latter will first run free until its collar 12 swings lever 16, and thereby opens valve 15. The further re-
 5 turn movement of the spindle will now turn elbow-lever 9 so that piston 7 and platen 8 will be forced into their lowermost position, simultaneously raising counterweight 24. During this time the water will escape from
 10 cylinder 1 through pipe 26.

The spindle 6 may be operated in suitable manner, as by a crank-shaft, screw, rack, or steam-piston, &c.

In Fig. 2 the arrangement is substantially
 15 the same as that shown in Fig. 1; but the spindle 6 and cylinder 5 are arranged parallel to piston 7. With this construction the lever 9 is straight and the lever 16 is connected by link 17 to stem 19 of valve 15, the lever 18
 20 being omitted. The fixed platen 3 is shown to be arranged at the bottom of the press and the piston 7 performs its work on the down-stroke, so that it will descend by gravity during the light running of the press. The coun-
 25 terweight 24 is therefore dispensed with. The spindle 6 is shown to be made in the form of a piston-rod, the piston 27 of which reciprocates within a steam-cylinder 28.

What I claim is—

1. In a hydraulic press, the combination of 30
 a pressure-cylinder having a valve with a work-
 ing cylinder communicating with the pressure-
 cylinder, a piston in the pressure-cylinder, a
 spindle in the working cylinder, a first lever
 that operatively connects the spindle with the 35
 piston, a second lever pivoted to said first le-
 ver, and means for operatively connecting the
 second lever with the valve, substantially as
 specified.

2. In a hydraulic press, the combination of 40
 a pressure-cylinder having a valve with a work-
 ing cylinder communicating with the pressure-
 cylinder, a piston in the pressure-cylinder, a
 spindle in the working cylinder, a collar on
 the spindle, a first lever operatively connected 45
 to the piston, a second lever pivoted to the
 first lever, and means for operatively connect-
 ing the second lever to the valve, the first and
 second levers being adapted to engage the
 spindle-collar, substantially as specified. 50

Signed by me at Dresden, Germany, this
 31st day of March, 1904.

OTTO PHILIPP.

Witnesses:

RUDOLPH FRICKE,
 P. V. T. DUNN.