

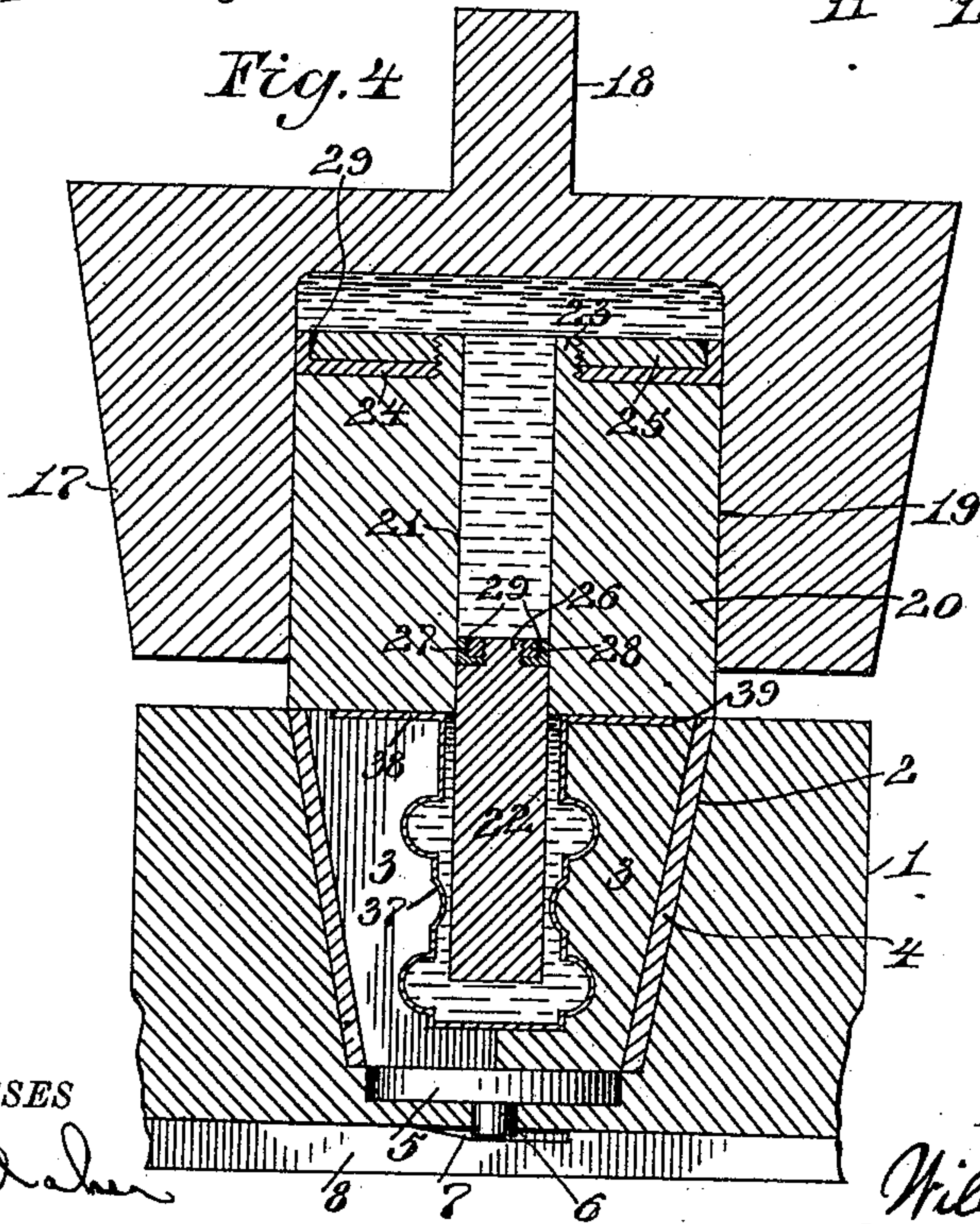
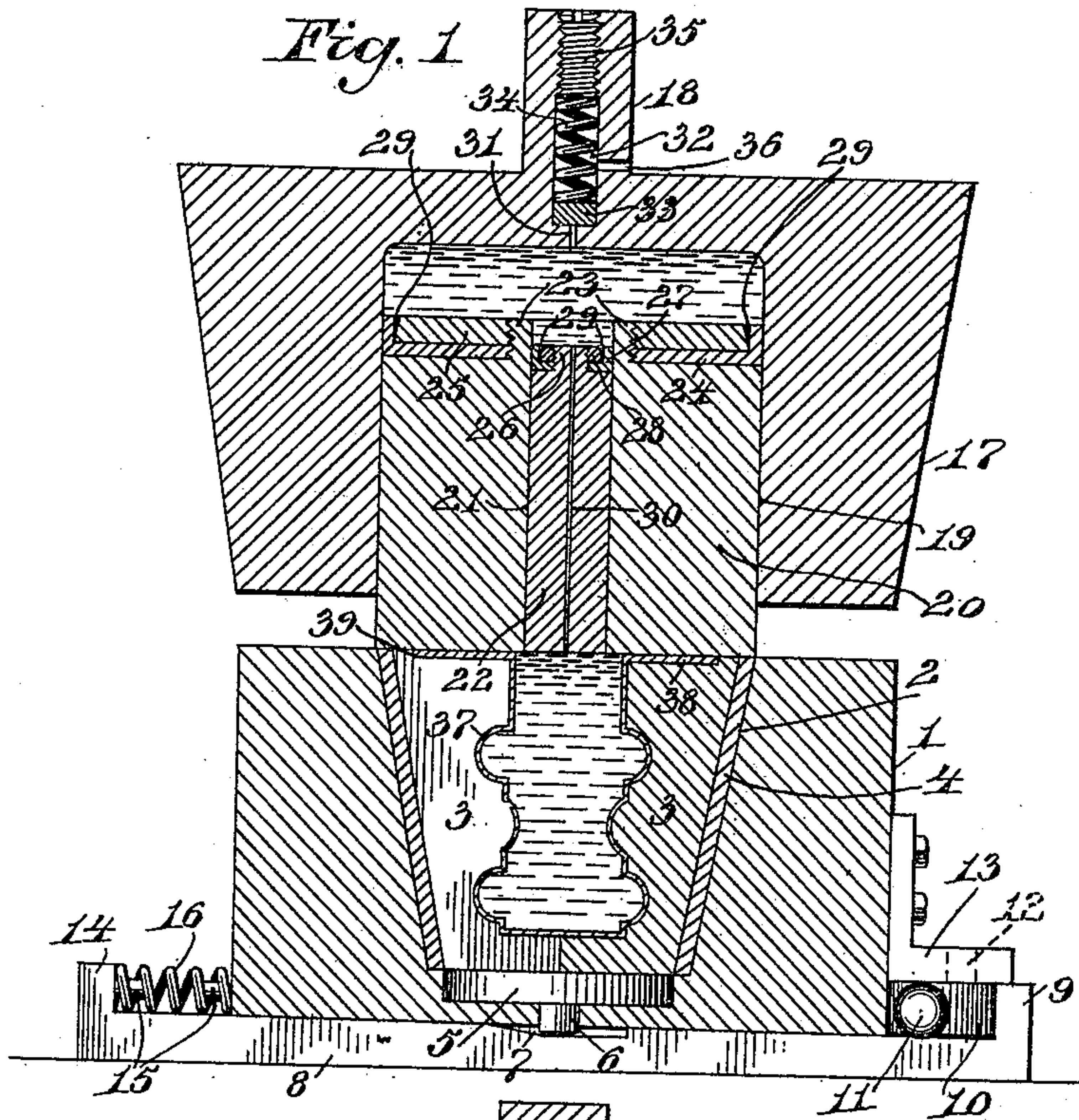
(No Model.)

2 Sheets—Sheet 1.

W. S. STAPLEY.
SHAPING PRESS.

No. 464,737.

Patented Dec. 8, 1891.



WITNESSES

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M. A. Huggard.

INVENTOR

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Atty.

(No Model.)

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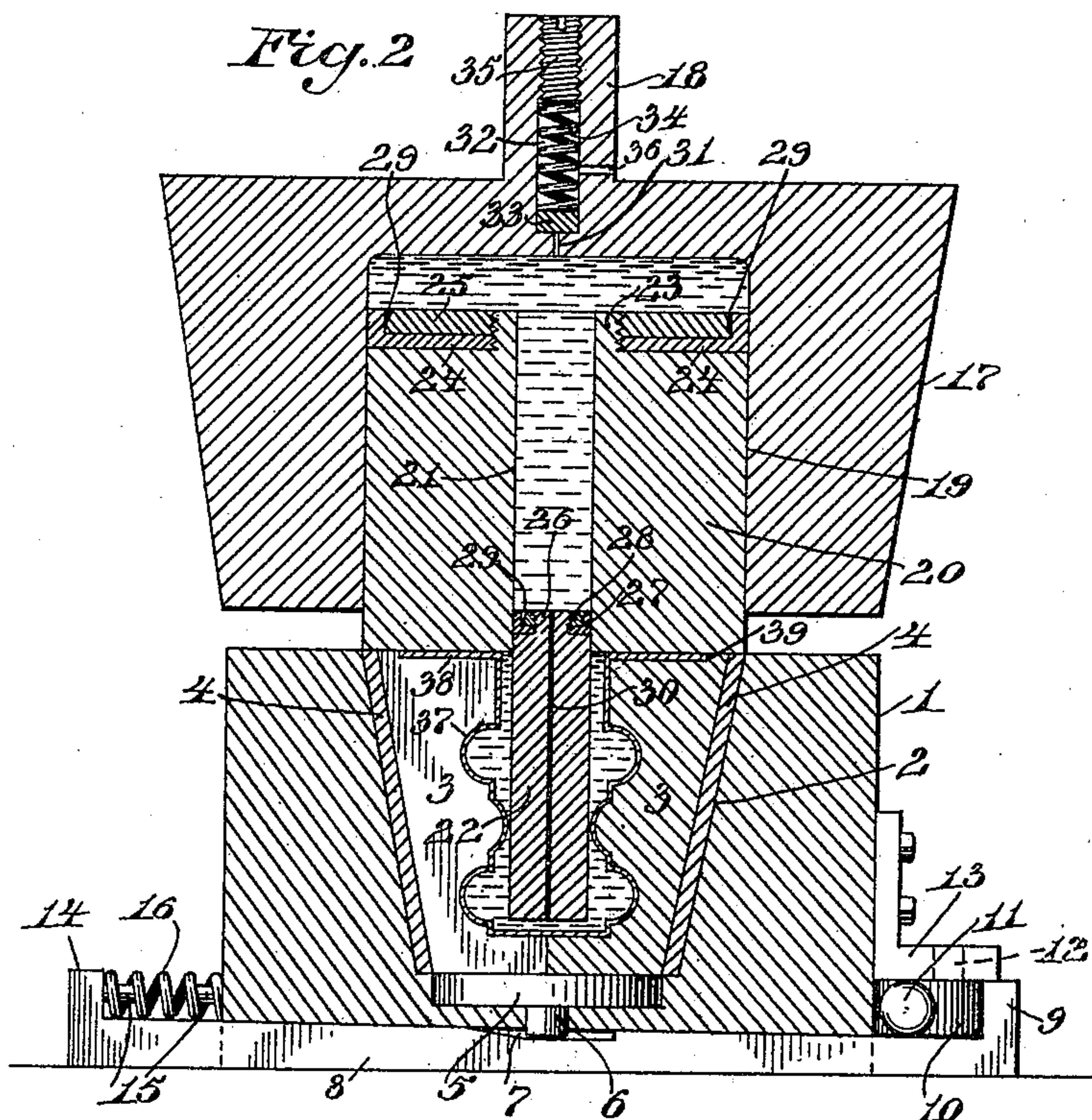
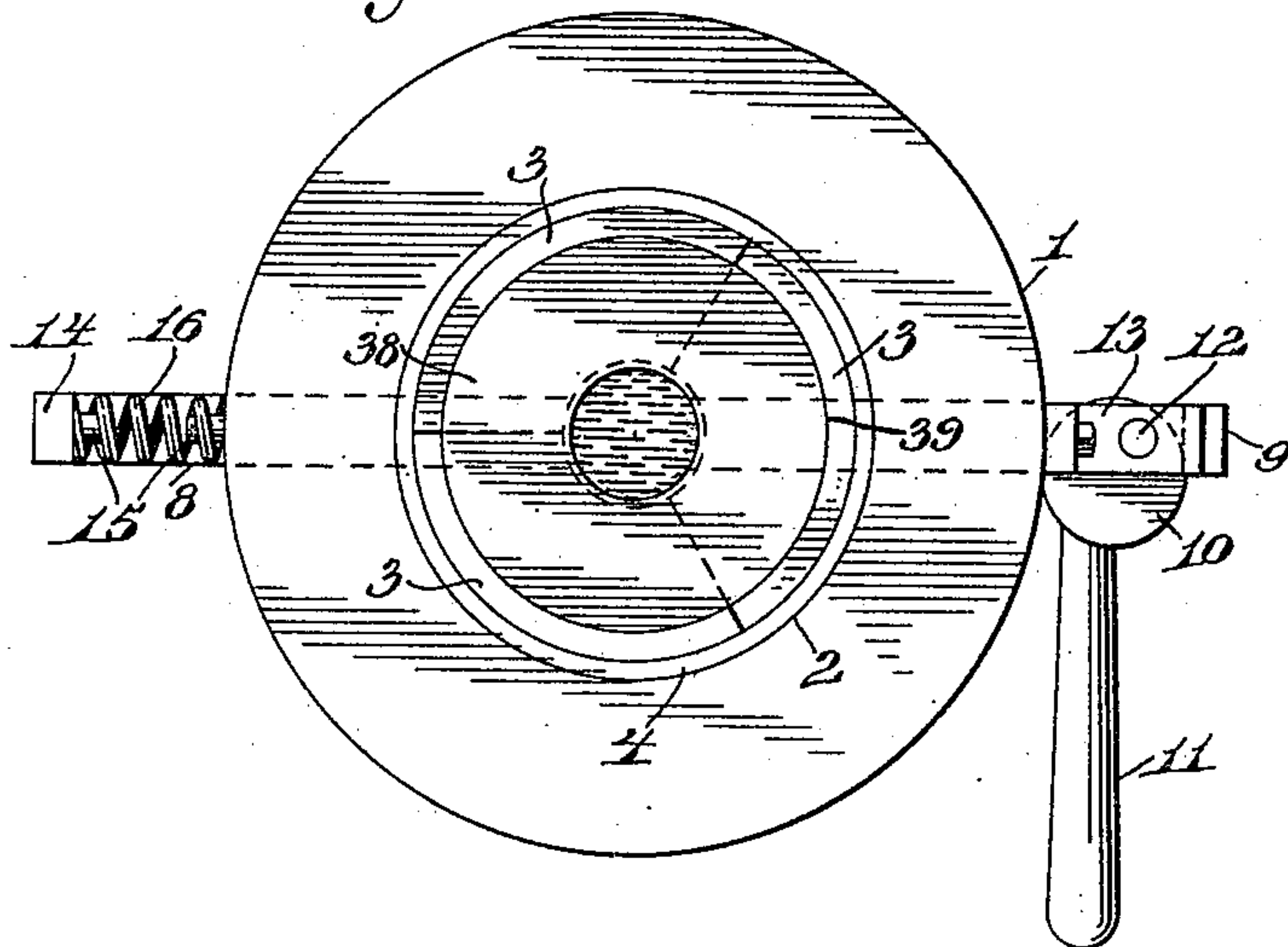


Fig. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM S. STAPLEY, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE
MERIDEN SILVER PLATE COMPANY, OF SAME PLACE.

SHAPING-PRESS.

SPECIFICATION forming part of Letters Patent No. 464,737, dated December 8, 1891.

Application filed July 8, 1891. Serial No. 398,763. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. STAPLEY, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Shaping-Presses; 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 use the same.

My invention relates to the class of shaping-presses by which hollow metallic table-ware, cane-heads, and similar articles are embossed and otherwise ornamented by water-pressure from within while the blanks are inclosed in suitable dies, and has for its object to simplify and cheapen the construction and operation of the press, to produce, in brief, a construction which shall be easily operated, practically impossible to get out of repair, and always ready for use, it being immaterial, so far as my present invention is concerned, whether the pressure upon the water in the blank is produced by hydraulic means, by an ordinary rotary or cam press, or by a drop-press.

In order to accomplish the desired result, I have devised the simple and novel self-locking press, of which the following description, in connection with the accompanying drawings, is a specification, numbers being used to denote the several parts.

Figure 1 is a vertical section of the operative parts of my novel press, the position being at the instant of the beginning of the pressure upon the interior of the blank, the plunger being still in the raised position; Fig. 2, a similar view, the position of the parts being at the extreme of pressure upon interior of the blank, the plunger being at the lowered position; Fig. 3, a plan view of the die-block with the dies having a blank within them in position therein; and Fig. 4 is a view corresponding with Figs. 1 and 2, except that a solid plunger is used.

1 denotes the die-block, which in use is clamped down upon the bed or bolster plate (not shown) in any ordinary or preferred manner.

2 denotes a downwardly and inwardly tapering recess in the die-block to receive the

dies 3. Three, four, or any suitable number of dies may be used, three being the number used in the press from which these drawings were made. The dies are suitably engraved in the usual manner to produce the raised ornamental figure desired upon the blank. The dies may be placed in contact with the die-block itself, but are preferably placed within a tapering sleeve 4 and rest upon a plate 5, having a shank 6, which extends downward through an opening in the bottom of the die-block and rests upon a wedge 7 on a bar 8, which lies in a recess in the under side of the die-block. At one end of the bar 8 is a block 9, which is adapted to be engaged by a cam 10 when it is desired to move the bar longitudinally to cause the wedge to lift the dies by engagement with shank 6. The wedge is provided with an operating-handle 11 for convenience in use, and is also provided with a hub 12, which engages an angle-piece 13, by which it is retained in operative position. At the opposite end of bar 8 I preferably place a block 14, having a hub 15. The bar is returned to its normal position after it has been moved to lift the dies and the cam has been turned back to its normal position by means of a strong spring 16, one end of which presses against block 14, the other against the die-block, said spring being held in position by the hub 15 on block 14, and by a similar hub on the die-block.

17 denotes the head-block having a shank 18, by which it is attached to the ordinary gate or head of a press. The head-block is provided with a recess 19 to receive a plug 20, which is itself provided with an opening 21 through it, in which lies a plunger 22. The upper portion of the plug is cut away, leaving only an exteriorly-threaded central portion 23. The object of this cut-away portion is to form a seat for a hydraulic angle-washer 24, said washer being held in place by a nut 25, which engages the threaded central portion. The function of this washer is to prevent the escape of water from recess 19 in use, as will be more fully explained. The upper end of the plunger is also cut away in a similar manner, leaving a threaded central portion 26.

The object of cutting away the top of the plunger is to provide a seat for a hydraulic

angle-washer 27. This washer is held in place by a nut 28, which engages the threaded central portion of the plunger. In practice I cut away the outer faces of nuts 25 and 28 slightly, so as to form annular recesses 29 between the nuts and the washers, so that as soon as pressure is applied water will enter these recesses and expand the angle portion of the washers outward, thereby rendering it absolutely impossible that there should be leakage of water.

As already stated, the principle of my invention is equally adapted to a hydraulic press, to an ordinary rotary or cam press, or to a drop press. In order to adapt my present invention to a rotary or cam press, I provide a minute longitudinal opening 30 through the plunger. The exact size of this opening is of course not of the essence of my invention, as it must necessarily vary to meet the requirements of use. In the press from which these drawings were made, opening 30 is about one thirty-second of an inch in diameter. I also provide in the die-block, in the shank thereof, as shown in the drawings, a minute opening 31, leading into a larger opening 32. Within the larger opening and closing the minute opening is a valve 33. The valve is held in operative position by a spring 34, which is itself held in position and its tension adjusted by a screw-plug 35.

36 denotes an orifice leading from opening 32 for the escape of water after the valve shall have been lifted. In practice in rotary and cam presses spring 34 is graduated to yield through the pressure upon the valve of water passing through opening 31 at the instant the predetermined pressure per square inch upon the blank within the dies shall have been reached. The pressure employed in the press from which these drawings were made is approximately one hundred and fifty tons to the square inch. It will of course be understood that any amount of pressure that can ordinarily be required in ornamenting small-sized articles can be produced in either rotary or cam presses, provided a relief-valve of this class is used, so as to prevent the press from becoming set. In either hydraulic or drop presses it is unnecessary to provide an opening through the plunger or a relief-valve. In hydraulic presses any required amount of pressure can be produced, and when the predetermined pressure has been reached any ordinary trip mechanism, such as is in common use, may be employed, which will act to relieve the pressure, or the degree of pressure that is being generated may be indicated by a gage and the pump stopped when the required pressure has been reached. In drop-presses the degree of pressure is of course regulated by the weight and fall of the drop.

In Fig. 4 I have illustrated a form in which the plunger is made solid and the relief-valve is wholly done away with. It should be noted, however, that the use of the relief-valve and

the plunger with a minute opening through it is in no way objectionable, either in hydraulic or in drop presses. In ordinary use with either drop or hydraulic presses a relief-valve will be found valuable, but not necessary. For instance, should a bubble of air form in recess 19 the relief-valve will allow it to pass out.

37 denotes the blank from which the article is to be formed and which is spun or drawn to approximately the shape of the finished article, the blank fitting closely in the recess in the dies. In practice the blank is provided with a flange 38, and a recess 39 is formed in the tops of the dies which just receives it, this flange, as well as the entire upper ends of the dies, being covered by a plug 20 in use, thus making the press self-locking. The dies with the blank inclosed therein are set down in place in tapering sleeve 4, their lower ends resting on plate 5. Water is then poured into the blank, filling it full.

In starting the press the die-block is removed from the gate or head, then inverted and recess 19 filled half full (more or less) with water. The plug is then pressed in until the water is level with the face of the plug. The plunger is then pressed in until its outer faces are level with the plug. The head-block with the plug and plunger in position, as in Fig. 1, is then attached to the gate or head of the press in the ordinary or any preferred manner.

When the pressure is produced by a hydraulic press working from below, the faces of the dies with the blank therein are moved up against the plug, as in Fig. 1, which seals the dies and presses the water in the head-block against the plunger, forcing the latter against the water in the dies, as in Fig. 2, until the required pressure is obtained. Ordinary tripping mechanism (not shown) is preferably used, which will stop the pump when the required pressure is reached, or, as stated above, the pressure may be indicated by a gage. If tripping mechanism is used, after it has acted the die-block and dies will drop down to their original position, leaving the plunger standing out from the head-block, as in Fig. 2. The operator pushes the plunger in, as before, until its outer face is level with the face of the plug. The dies are then lifted in the manner described and the finished blank removed therefrom, after which the dies are thoroughly dried and the operation may be repeated as before. Each blank to be operated upon is filled with water after the dies are in position in the die-block. The head-block does not require to be removed and refilled with water, as there is no waste of water in recess 19.

When either a cam, rotary, or hydraulic press is used, the operation is precisely the same, except that instead of the die-block moving upward the head-block moves downward. The plug in each instance is moved upward relatively to the head-block, which

causes the water in recess 19 to press the plunger downward from the position shown in Fig. 1 to that shown in Figs. 2 and 4.

Having thus described my invention, I claim—

1. In a press of the class described, the combination, with the die-block and dies adapted to inclose a blank, of a head-block having a recess adapted to contain water, a plug in said recess having an opening through it, and a plunger filling the opening in the plug, whereby pressure exerted upon the plug when the dies are in contact will act to force the plunger downward into the opening in the dies.

2. The combination, with the die-block and dies, of a head-block having a recess adapted to contain water, a plug in said recess having an opening through it, a threaded portion 23, a hydraulic angle-washer 24, and a nut 25 engaging the threaded portion by which the washer is held in place, a plunger filling the opening in the plug and having a threaded portion 26, a hydraulic angle-washer 27, and a nut 28 engaging the threaded portion to hold the washer in place.

3. The combination, with the die-block and dies, of a head-block having a recess adapted

to contain water, a minute opening 31, leading to a larger opening 32, a spring-actuated valve in said larger opening and an escape-orifice 36, a plug in said recess having an opening through it and a plunger filling the opening in said plug and having a minute opening 30 through it, whereby when a predetermined pressure has been reached the pressure of water passing through minute openings 30 and 31 will raise the valve and permit the escape of water, thereby relieving the pressure.

4. The combination, with the head-block and dies and a plate 5 upon which the dies rest and which is provided with a shank 6, of a bar having a wedge 7 and blocks 9 and 14, a cam adapted to engage block 9 to move the bar horizontally, so that the wedge will raise the die-block, and a spring bearing against block 14 to return the bar and wedge to its normal position when the cam is moved backward.

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

WILLIAM S. STAPLEY.

Witnesses:

FRANK H. CUSHING,
E. S. THOMPSON.