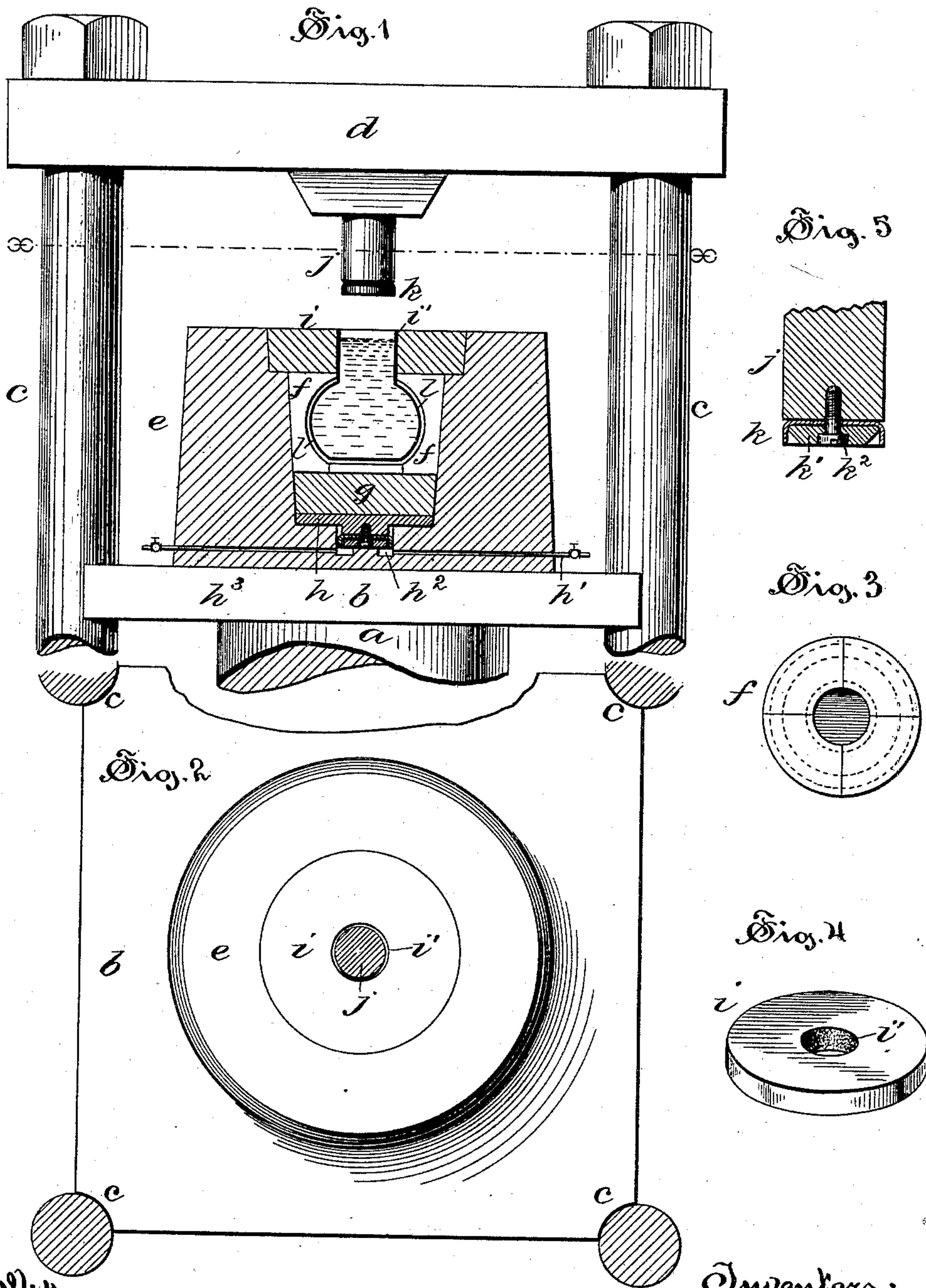


(No Model.)

R. P. CHAPMAN & E. T. CARTER.  
APPARATUS FOR ORNAMENTING HOLLOW WARE.

No. 426,557.

Patented Apr. 29, 1890.



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# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR ORNAMENTING HOLLOW WARE.

SPECIFICATION forming part of Letters Patent No. 426,557, dated April 29, 1890.

Application filed February 28, 1890. Serial No. 342,083. (No model.)

*To all whom it may concern:*

Be it known that we, RUSH P. CHAPMAN and EDWIN T. CARTER, citizens of the United States, residing at Hartford and Meriden, respectively, in the counties of Hartford and New Haven and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Ornamenting Hollow Ware, of which the following is a full, clear, and exact specification.

The invention relates to the class of apparatus for reproducing by hydraulic pressure repoussé, raised, or engraved designs on hollow ware, as tea and coffee pots, sugar-bowls, cream-pitchers, and the like.

In ornamenting hollow ware by liquid pressure great force is required to expand the metal of the blank into every crack and crevice of the dies to form a perfect design, and the difficulty experienced is to seal the parts so as to prevent leakage of the liquid under the enormous pressure to which it is subjected; and the object of my improvement is to simplify and cheapen the mechanism employed for such purpose, to reduce the number of operations, and economize in the use of material in the blank.

Referring to the accompanying drawings, Figure 1 is a side view of the apparatus, part being in central vertical section. Fig. 2 is a view in horizontal section on plane denoted by line  $x x$  of Fig. 1. Fig. 3 is a top view of the dies. Fig. 4 is a perspective view of the die-cover plate. Fig. 5 is a view in section of the lower end of the plunger.

In the views the letter  $a$  denotes the upper end of a ram of any ordinary hydraulic press. This ram bears a bed-plate  $b$ , which is guided in its vertical movement with the ram by posts  $c$ , which support the top plate  $d$  of the press. The bed-plate bears a die-holder  $e$ , provided with a slightly-tapering central opening, into which is set the die or mold  $f$ , which is formed from any suitable metal in sections having on their inner walls an intaglio representation of the design to be embossed upon the hollow-ware article. The die rests upon a bed  $g$ , beneath which is a plate  $h$ , adapted to be raised by hydraulic pressure transmitted from the pump through the pipe  $h'$  into the chamber  $h''$ , which is properly packed and can be re-

lieved by the cock at the end of the passage  $h'''$ , so that the die may be started out of the holder in order that it may be removed. In the opening in the top, resting partly on the holder and partly on the die to hold the sections in place and strengthen their upper edges, is placed a circular metal plate  $i$ , having a central opening  $i'$  (the walls of which are slightly roughened) a little larger than the diameter of the solid plunger  $j$ , which depends from the top plate  $d$  directly over the opening through the plate  $i$  into the die. The end of this plunger, which is of a size to fit into the neck of a vessel to be ornamented, is provided with a valve or seal  $k$ , constructed so as to be forced outward against the walls of the neck by the resistance of the liquid in the interior of the vessel to tightly seal the joints and prevent the escape of fluid when the pressure is being applied. This seal consists of a cup of flexible material, held to the solid plunger by a plate  $k'$ , through which a screw  $k''$  passes into a threaded socket into the plunger.

The blank  $l$ , which is spun to approximate the final size and shape, is placed within the die and filled nearly full of water. The plate  $i$ , the opening with roughened walls in which closely fits the exterior of the neck of the blank, is placed on the die, and the ram carrying these parts is started upward, forcing the plunger, which fits the interior, with great pressure into the neck of the blank, causing the water to expand the vessel into every indentation in the die. As the ram rises, the resistance of the liquid in the vessel forces the seal  $k$  outward against the sides of the neck of the blank, which is thereby forced with the same pressure against the walls of the opening in the plate, and as the pressure outward on the seal is the same as that transmitted throughout the liquid, the seal is made to bind so tightly against the walls of the neck of the vessel that leakage is impossible, and as there is so much greater friction between the rough walls of the opening in the plate and the exterior of the neck than between the interior and the smooth lubricated seal and plunger, the neck of the blank is held fast to the plate and not dragged or buckled into the interior by the friction of the plunger as it



moves inward. Prior to our invention this sealing has been accomplished by tightly holding to the top of the die an outwardly-projecting flange, formed upon or soldered to the upper edge of the blank by a supplemental annular ram, which closely fits and surrounds a perforated plunger, the liquid for expanding the blank being pumped through the opening in the plunger after it has been inserted in the neck of the blank, also by tightly closing the mouth of the vessel and pumping the liquid into the interior through a small opening in the bottom. In the present form by seating the seal on the end of the plunger and forming it so that it will expand outwardly and hold the neck of the blank against the walls of the opening in the plate a tight seal is formed, which increases in tightness as the pressure increases, thus preventing the escape of any of the fluid without the necessity of forming or soldering a flange upon the top of the neck of the blank, which of course cannot be formed or spun up true enough to make a water-tight fit with the plunger or the opening in the plate on the die. It will be noticed that the outward thrust of the pressure of the seal is first and borne by the plate, so as to relieve the upper edges of the die and prevent their being broken down. Several parts are dispensed with by the use of this mechanism which are considered essentially necessary in the prior devices. The operation of forming the seal by a separate ram or apparatus is dispensed with, and the metal formerly required in forming the sealing-flange is not required in the improved method of sealing.

We claim as our invention—

1. In a hollow-ware ornamenting apparatus, in combination, a ram, a die-holder bearing a sectional die stationarily supported by

the ram, a blank filled with liquid held in the die, a solid plunger supported by the frame above the opening into the die, and a seal attached to the plunger, whereby when the ram is raised the plunger is forced into the blank and the liquid automatically seals the opening and expands the blank into the ornamentation of the die, substantially as specified.

2. In a hollow-ware ornamenting apparatus, in combination, a ram, a die-holder bearing a sectional die supported by the ram, a blank filled with liquid held in the die, a solid plunger stationarily supported by the frame above the opening into the die, and a seal attached to the plunger and adapted to be expanded outwardly when the plunger enters the neck of the blank, substantially as specified.

3. In a hollow-ware ornamenting apparatus, in combination, a ram, a die-holder bearing a sectional die supported by the ram, a blank filled with liquid held in the die, a plate placed upon the die, with an opening fitting the exterior of the neck of the blank, and a plunger bearing an outwardly-expanding seal stationarily supported above the opening into the die, substantially as specified.

4. In a hollow-ware ornamenting apparatus, in combination, a ram, a die-holder bearing a sectional die supported by the ram, a blank filled with liquid held in the die, a plate placed upon the die and having a central opening with slightly-roughened walls fitting the exterior of the neck of the blank, and a plunger bearing an outwardly-expanding seal stationarily supported above the opening into the die, substantially as specified.

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