

No. 835,100.

PATENTED NOV. 6, 1906.

R. E. DEVINE.  
MACHINE FOR EMBOSsing METAL HOLLOW WARE.  
APPLICATION FILED MAR. 20, 1906.

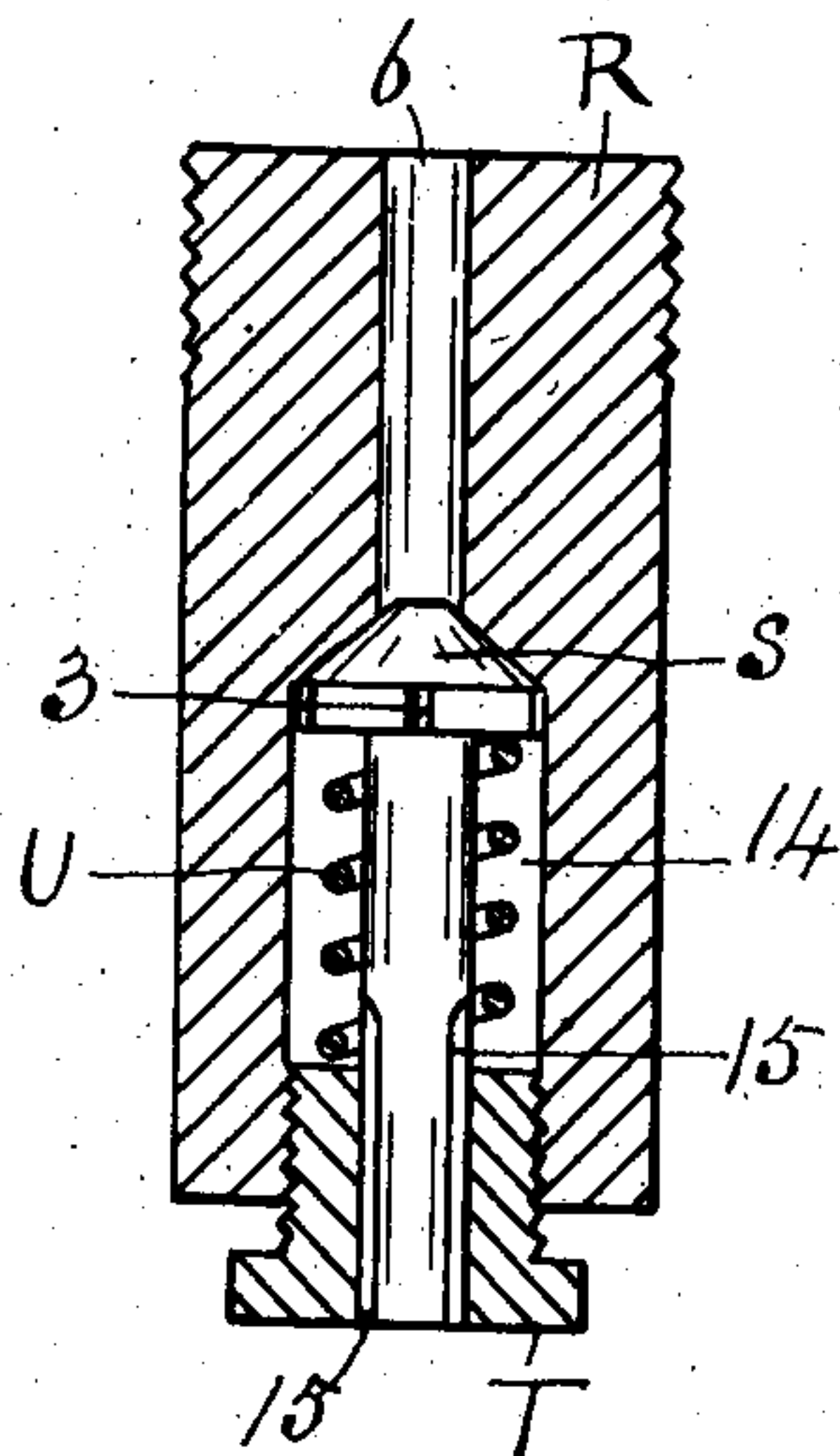


Fig. 3.

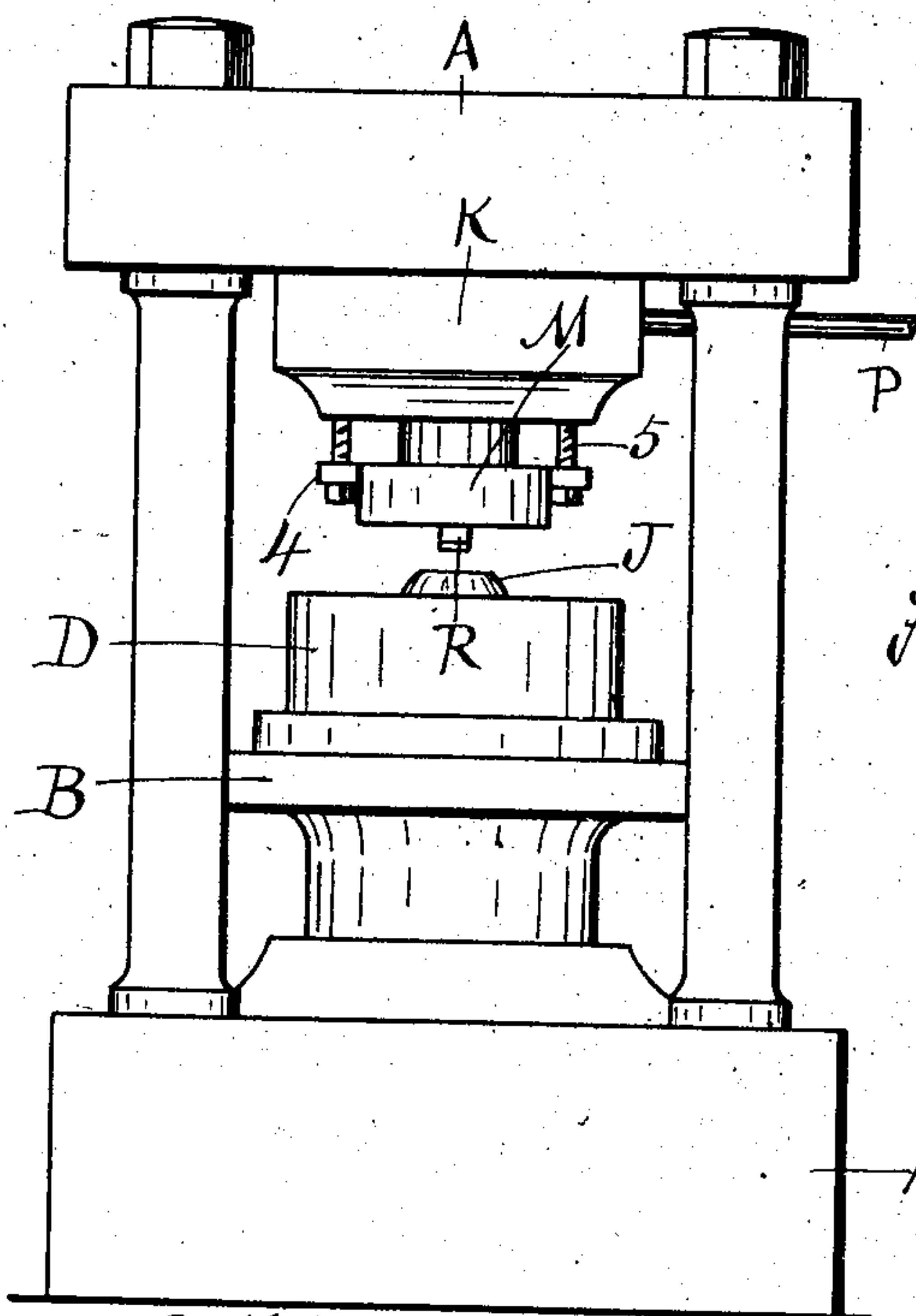


Fig. 1.

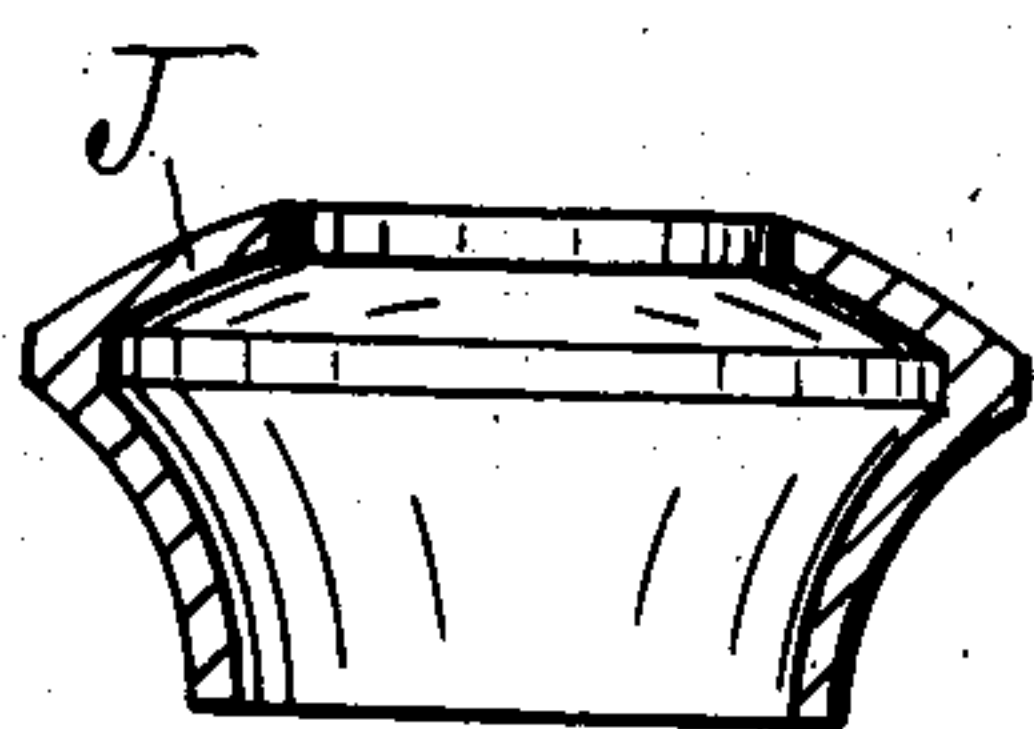


Fig. 4.

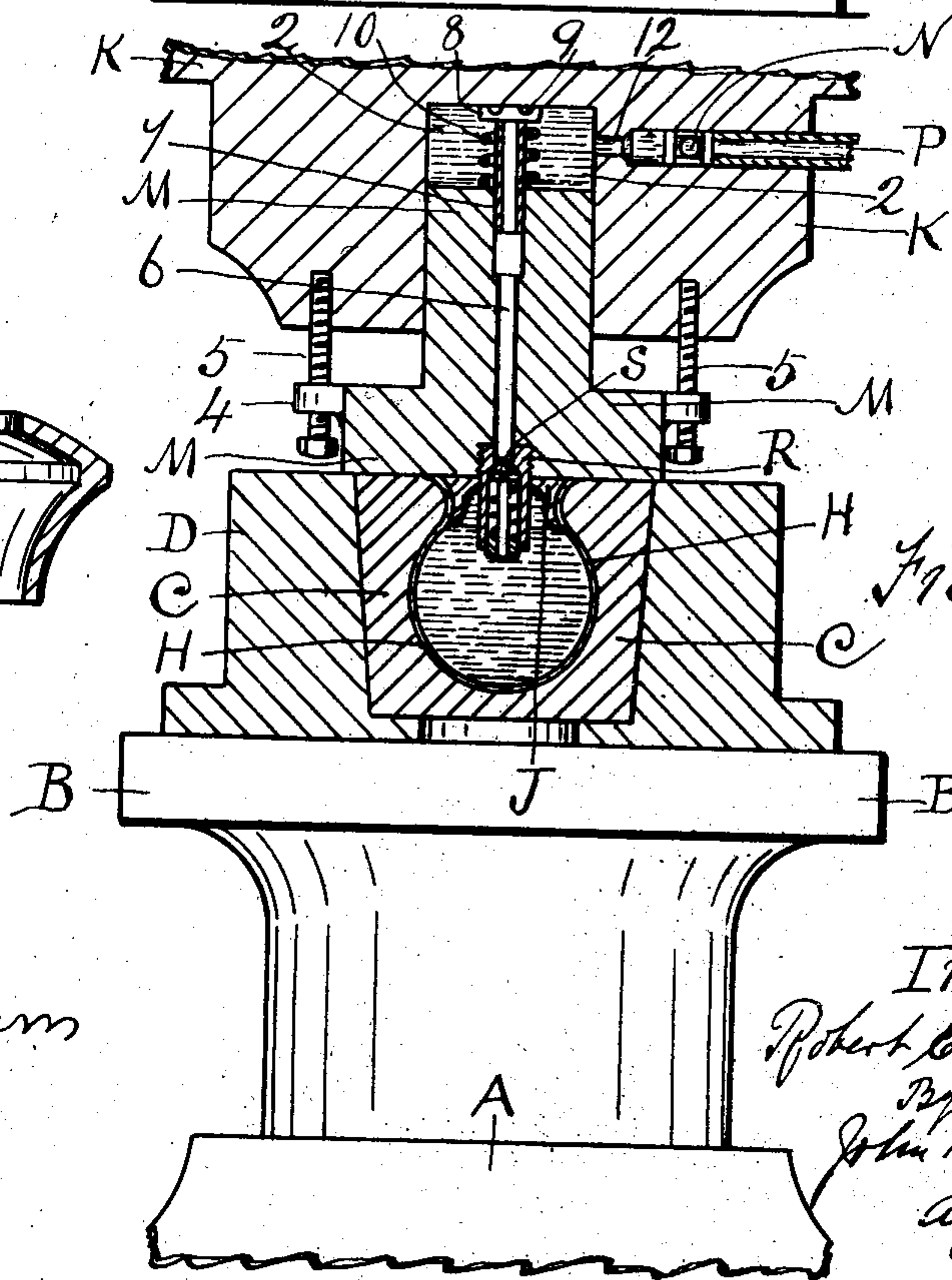


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR EMBOSSING METAL HOLLOW WARE.

No. 835,100.

Specification of Letters Patent.

Patented Nov. 6, 1906.

Application filed March 20, 1906. Serial No. 307,130.

*To all whom it may concern:*

Be it known that I, ROBERT E. DEVINE, a subject of the King of Great Britain, and a resident of Hamilton, in the county of Wentworth and Province of Ontario, Canada, have invented new and useful Improvements in Machines for Embossing Metal Hollow Ware, of which the following is a specification.

My invention relates to improvements in machines for embossing metal hollow ware, in which a suitable metallic mold containing the sheet-metal bowl or vessel partially filled with water is placed on a hydraulic ram, and means for confining and also for increasing the pressure of water in the bowl when the ram is operating.

The object of my invention is to provide means for producing raised figures or designs of various kinds on the outer side of sheet-metal bowls or vessels capable of being impressed or embossed with ornamental design and the inner side of the bowl or vessel to follow the contour of the figures or design as produced on the said outer side. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the machine at rest and ready for operation of the hydraulic ram. Fig. 2 is an enlarged sectional elevation of the important parts of the machine when the machine is embossing on the bowl by hydraulic pressure. Fig. 3 is an enlarged detail sectional elevation of the lower valve part or plunger of the machine. Fig. 4 is an enlarged detail sectional elevation of the rubber neck-ring.

In the drawings the hydraulic machine is indicated by A, and B is the table or head part of the ram, which is adapted to gradually rise and to fall by means of ordinary hydraulic power. C is the mold in two or more parts and fits into a tapered hole in a slidable steel ring D, the bed of which is secured on the table B of the ram. The outer part of the mold is tapered and the ring D conforms thereto, that the mold may be easily removed therefrom after each process of embossing.

The above-indicated parts in the drawings or their equivalents I do not claim as entirely new.

A bowl H is shown in the mold and par-

tially filled with water, and the bowl conforms to the interior face part of the mold or to the mold proper. The interior of the mold is impressed with suitable design or figures. Consequently certain depressions or recesses are formed therein, and the water-pressure in the bowl presses the sides of the bowl to conform with said depressions in the mold. The neck of the bowl is supplied with an annular rubber inner ring or neck J, which fits around the upper reduced part of the bowl, extending a short distance into the bowl and extending above and inwardly, as shown in Fig. 1 of the drawings. The rigid head part K of the machine forms a part of the same and is rigid therewith. The head K has a central vertical bore 2, in which is inserted a ram M, which is adapted to slide in the bore 2 within a distance from the top of the bore or chamber 2. The ram M has a lower flange which forms a part of the same and has lugs 4, through which loosely pass the bolts 5, which are screwed into the head K. The ram M is adapted to slide on the bolts 5 and has a central vertical hole 6, the upper part of which contains the lower end part of a tube 7. The tube 7 has a head 8 with upper openings 9, which communicate with the tube. The head 8 is held close to the top of the bore 2 by means of a spiral spring 10 around the tube 7 and pressing against the end of the ram M and the under part of the head 8.

The upper part of the bore 2 may be properly termed a "water-chamber" for the inlet of water through a hole or pipe P, which enters the head K and communicates with the chamber 2 through a reduced opening 12 in said head K. The inlet-pipe or water-way P is supplied with a suitable check-valve N, which allows the water to pass through the pipe P to the chamber 2, but will check any return of the water from said chamber. The lower part of the ram M is bored and threaded to receive the threaded end of the body part R of the inner valve S. The lower end of the body R has an adjustable nut T screwed therein, and a spiral spring U fits around the spindle of the valve and extends from the top of the nut T to the under part of the head part of the valve and supports the same.

Through the head part of the valve are openings 3, which communicate with the hole 6 in the ram M and with the chamber 14 in



the body R when the valve S is open. The spindle of the valve S has grooves 15, which extend from a part of the spindle above the top of the nut T to the lower end thereof and communicate with the chamber 14 and with the interior of the bowl H when the hydraulic ram is in operation.

The operation of the machine is as follows: When a pressure of water through the pipe P and check-valve N enters the chamber 2, the air in said chamber passes through the openings 9 of the tube-head 8, thence downward through said tube and through the vertical central hole 6 in the ram M, and the air, followed by the water in the hole 6, presses downward the valve S, thereby opening the valve. The air then escapes, together with the water, through the openings 3 in the valve and through the slots 15 in the valve-spindle. At this time the hydraulic ram-head B is forced upward by common hydraulic pressure in the machine. Upon the upward movement of the ram-head B the upper inwardly-extended part of the yieldable rubber ring J is forced downward and the outer part of the ring J is forced against the neck of the bowl H, thereby sealing the same. At this time the top face of the mold C comes in close and sealed contact with the lower face of the ram M and seals the said faces. Immediately the ram M rises by said contact with the ram-head B the water in the chamber 2 is forced through the holes 9, thence through the tube 7 and the hole 6 and the valve S and through the vertical slots 15 and into the bowl H to give pressure to the water in the bowl and force the smooth and even sides of the bowl into the designed recesses in the sides of the mold C and follows the identical contour of the recesses or depressions.

It will be noticed that the upper ram M is considerably smaller in diameter than the lower hydraulic ram B, consequently greatly

increasing the pressure of the water on the walls of the metal body of the bowl or vessel being embossed. The function of the smaller ram M is to augment and to increase the pressure of water in the bowl.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for embossing metal hollow ware, a hydraulic ram, a mold on the ram, a metal bowl or vessel in the mold, a rubber ring extending inwardly and upward from the neck of the vessel, a smaller ram in the machine and above the mold, a water-chamber on the smaller ram, and means for engaging the upper ram with the ring and mold and discharging pressure-water into the vessel at said engagement.

2. In a machine for embossing metal hollow ware, a hydraulic ram, a mold on the ram, a bowl in the mold, a rubber ring inwardly and upwardly extending from the upper part of the bowl, a smaller ram above the mold, a water-chamber on the smaller ram and means for discharging pressure-water from said water-chamber into the bowl, upon the engagement of the ring and mold and sealing the same with the upper ram.

3. In a machine for embossing metal hollow ware, a hydraulic ram, a mold on the ram, a metal hollow-ware bowl in the mold, a rubber ring inwardly and upwardly extending from the upper part of the bowl, a smaller ram above the mold, means for supporting the ram, a water-chamber on the ram, a controlled water-inlet in the chamber, a valve extending below the ram and communicating with the chamber, means for discharging pressure-water into the bowl upon the sealing of the ring and mold with the ram.

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Witnesses:

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