(No Model.)

A. F. JACKSON & J. HEWITSON.

APPARATUS FOR SHAPING AND ORNAMENTING HOLLOW ARTICLES OF METAL.

No. 454,592. Patented June 23, 1891.

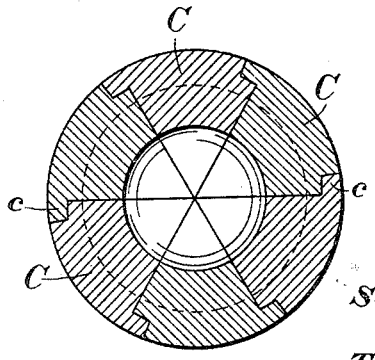

Fig. 2.

Fig. 1.

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UNITED STATES PATENT OFFICE.

AUSTIN F. JACKSON AND JOHN HEWITSON, OF TAUNTON, MASSACHUSETTS, ASSIGNORS TO THE REED & BARTON CORPORATION, OF SAME PLACE.

APPARATUS FOR SHAPING AND ORNAMENTING HOLLOW ARTICLES OF METAL.

SPECIFICATION forming part of Letters Patent No. 454,592, dated June 23, 1891.

Application filed September 29, 1890. Serial No. 366,426. (No model.)

To all whom it may concern:

Be it known that we, AUSTIN F. JACKSON and JOHN HEWITSON, both citizens of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Shaping and Ornamenting Hollow Articles of Metal, of which the following is a full specification.

Our invention consists of an improved apparatus adapted to shape and ornament hollow metal vessels by means of liquid under pressure, the vessel being contained in a suitable hollow mold and the liquid being subjected to pressure in a barrel communicating with the mold containing the vessel, the construction being such that the greater the pressure to which the liquid is subjected the closer together are the various parts pressed in such a manner as to avoid all possibility of leakage.

The accompanying drawings represent one form of our improved apparatus, in which—

Figure 1 is a sectional elevation of the complete apparatus; and Fig. 2 is a transverse section through the matrix or mold in the plane of X X, Fig. 1.

A represents either the bed-plate of the press or a suitable supporting-base to be set on said bed-plate. The piece A has preferably a depression on the top thereof, in which fits the ring B, which is a strong heavy piece of metal centrally cored out with a hole preferably tapering to receive tightly within it the matrix mold or die C. This die or mold is preferably for most purposes made in sections, as shown in Fig. 2, which fit accurately together, each section C being provided with one or more tongues or lugs *c*, fitting grooves or depressions *c'* in the adjacent section. The interior of the die is made of the requisite form for the article to be shaped, being provided with any desired surface ornamentation. The die, when the sections composing it are put together, is not perfectly cylindrical, but tapers slightly, as shown in Fig. 1, being somewhat larger at the top than at the bottom, the taper corresponding exactly with that of the inner opening of the annular holder or ring B.

The article to be shaped is first spun or drawn roughly into shape, and the sections forming the die are fitted together around it, the shape of the article for the die shown in the drawings being substantially that represented by D in Fig. 1. The neck of the embryo vessel D preferably projects somewhat above the top surface of the mold. The mold containing the article D is then pressed down into the central opening in the piece B, which holds the die firmly together, the height of the die being less than that of the holder B.

E is the barrel in which the liquid is pressed, consisting of a heavy metal cylinder provided with the central opening *e* from end to end. This cylinder fits loosely into the upper part of the central opening in the holder E above the die, a packing-washer G of leather, rubber, or other suitable material being introduced between the lower end of the cylinder and the top of the vessel D. The barrel is preferably provided with the liquid-passage *e'*, communicating both with the central opening *e* and with a pipe F, having a valve F', the said pipe F serving as the inlet-pipe for the water.

R is the plunger, provided at its lower end with the screw R', on which are held by means of the nut R^2 one or more packing-washers T of leather or other suitable material to fit tightly the opening *e* in the barrel. The flanged head R^3 of the plunger receives directly the pressure from the rod P of the press in which the whole is placed.

S is a stiff spring surrounding the plunger R, and seated between the flange R^3 and the top of the barrel E. Its function is to press the parts more firmly together the greater the pressure to which the water is subjected. The press may be hydrostatic or a simple hand-press, in which the rod P is moved downward by means of a screw. The parts being placed in position, as described, and in the press the vessel D and the opening *e* of the barrel E are filled or nearly filled with water through the pipe F. The valve F' is then closed. Pressure is then applied to the plunger R, which is communicated through the spring to the cylinder R', forcing the metal of the vessel D, which projects above the mold, down into the same till the washer G is firmly

pressed between the top of the mold and the bottom of the barrel E. At the same time the pressure of the liquid within the vessel D forces its walls outward to fill the mold completely and to receive whatever shape and surface ornamentation the said mold may have. The greater the pressure applied to the water the tighter the parts are pressed together by means of the spring S, so that all possibility of leakage is avoided.

We do not confine ourselves to the exact form of apparatus herein shown. Instead of a spiral metal spring one of rubber or other elastic material may be employed and arranged in any way between the point from which the pressure is obtained and the top of the die, so that any increased pressure on the liquid also presses more tightly the parts together.

Instead of water we may employ paraffine, tallow, pitch, or any liquid or plastic material.

We claim—

1. In an apparatus for shaping and ornamenting hollow metal articles, the combination of a hollow mold, a liquid-holding barrel, a plunger fitting said barrel, and a spring interposed between the plunger or any part thereof and the barrel, whereby by a single force on the plunger the metal is shaped and the joints of the apparatus are made tight, substantially as described.

2. In an apparatus for shaping and ornamenting hollow metal articles, the combination of a hollow mold made in sections, a containing ring or holder, a liquid-holding barrel, a packing-washer, a plunger fitting said barrel, and a spring interposed between the plunger or any part thereof and the barrel, whereby by a single force on the plunger the metal is shaped and the joints of the apparatus are made tight, substantially as described.

3. In an apparatus for shaping and ornamenting hollow metal articles, the combination of a hollow mold and holder, a liquid-holding barrel, a plunger fitting said barrel provided with a flanged head, and a spring surrounding said plunger and bearing between said head and barrel, all constructed, arranged, and operating substantially as and for the purposes described.

In witness whereof we have hereunto set our hands.

AUSTIN F. JACKSON.
JOHN HEWITSON.

Witnesses:
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