(No Model.)

J. R. PADDACK.

DIE FOR FORMING METAL ARTICLES.

No. 422,313. Patented Feb. 25, 1890.

Fig. 2.

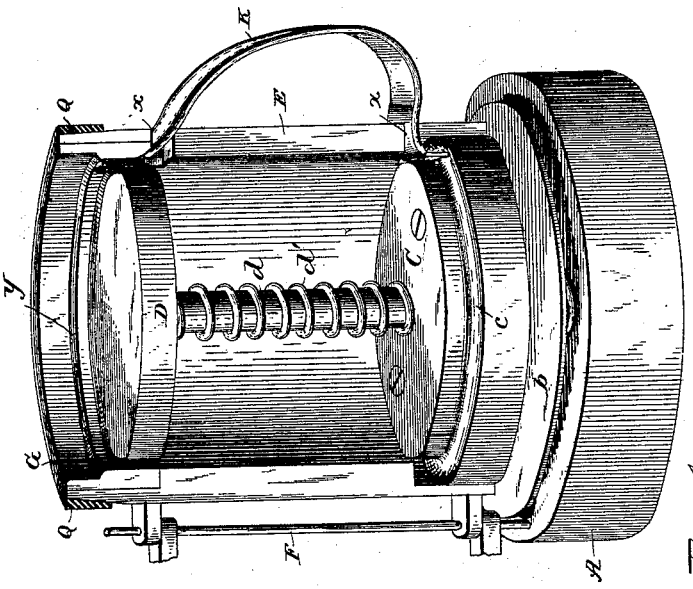


Fig. 5.

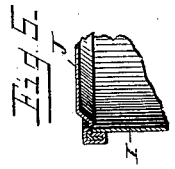


Fig. 4.

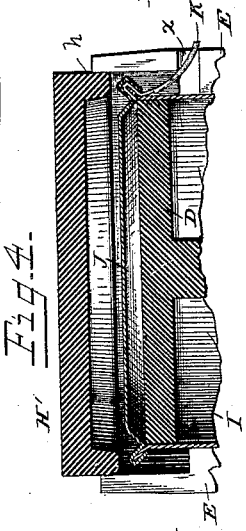


Fig. 1.

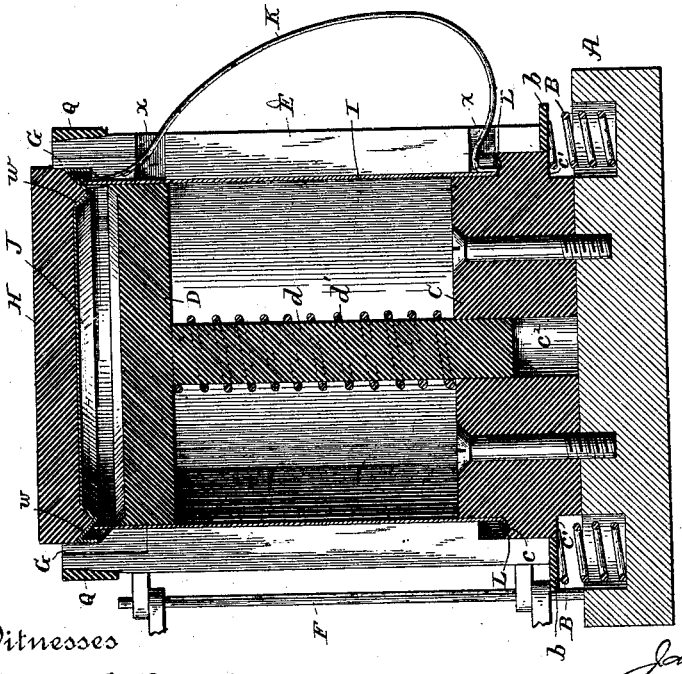
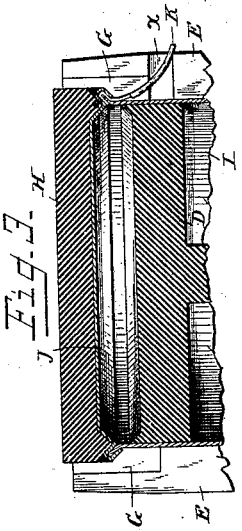


Fig. 3.



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DIE FOR FORMING METAL ARTICLES.

SPECIFICATION forming part of Letters Patent No. 422,313, dated February 25, 1890.

Application filed June 26, 1889. Serial No. 315,621. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. PADDACK, a citizen of the United States, residing at Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Dies for Forming Metal Articles, of which the following is a specification.

The primary object of the invention is an improved device for crimping and swaging the bottom into a sheet-metal vessel, curling the top with or without wire, and securing a handle to the same, all by a single operation.

The invention consists in the means whereby the above objects are attained, and it is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical sectional view of my die or swaging and crimping device. Fig. 2 is a perspective view of the same with the front portion of the case or shell removed. Fig. 3 is a detail view showing the joint made at the bottom of the cup or can. Fig. 4 is also a detail view showing a modification for forming a double-seam joint. Fig. 5 shows the double-seam joint thus formed.

Referring by letter to the drawings, A is the base-piece or support of my die, having recessed therein four spiral springs B B. Firmly secured to this base by means of screws or nuts is a curling-block C, which has an annular shoulder *c*, provided with a groove having a curved cross-section, as shown. The lower side of the curling-block is cut away in places for the reception of the upper ends of the coiled springs B and to form the shoulders c^4, bearing against the upper ends of the said springs, so that the latter are held in place in the recesses of the base A.

D is the interior swaging-block, which has a stem *d* extending downward and fitting into a recess c^2 of the curling-block, in which it is free to slide. The block D is normally held in a raised position by means of the coiled spring *d'*, surrounding the stem *d*, resting upon the upper face of the curling-block, and bearing against the lower face of the interior swaging-block.

E is the outer casing of my die, surrounding all the other parts, supported by the springs B B, and resting upon a thin circular plate *b* on the upper ends of said springs. The outer casing is formed of two parts which are adapted to fit one another to complete the outer shell, and these parts are preferably loosely hinged upon a rod F, as shown, whereby they may be readily swung open or shut and be free to move vertically upon said rod. Each part has an internal shouldered recess at each end, the lower one embracing the curling-block and the upper receiving the follower, and each half is also suitably notched in two places upon its edge. These notches, when the parts are closed upon one another, form openings through the outer casing for the admission of the handle or ear to be attached to the vessel. The parts are preferably secured in place by a tapering ring Q fitting over them.

G is the swaging-ring, in two halves or parts, each one of which is fitted into the shouldered recess of the parts of the casing E, and which form a continuous ring when the casing is closed. The upper face of this ring is recessed to form an annular beveled edge *y*, the recessed portion of the ring between the edge *y* and its end being of greater diameter than the diameter of the main portion of the casing E, and being adapted to receive the vertical flange which is preferably provided at the edge of the blank for the bottom or cover of the vessel.

H is a follower or external swaging-block adapted to fit within the outer casing and having an annular V-shaped rib of less diameter than the diameter of the body portion of the metallic vessel, the outer beveled face *w* of which corresponds with the beveled face of the swaging-rings.

In using the above-described device in making a can or bucket I take a cylindrical body of blank form *l*, of tin or other sheet metal, a bottom J, stamped in the form shown in cross-section, Fig. 1, a handle or ear K, and a wire ring L, Fig. 1. Starting then with the body or blank *l* in its position in the die—that is, slipped down over the interior swaging-block D—and the curling-block C resting on the grooved annular shoulder thereof and extending a short distance above the lower beveled edge of the swaging-ring, with the wire ring L also resting on the annular shoulder of the

curling-block outside the body or blank *l*, and the bottom J resting on the swaging-ring in the position shown, with the follower H placed on top thereof and with the ends of the handle K inserted through the apertures in the casing, as in Fig. 2, the operation is as follows: Pressure is applied to the follower H, forcing it downward. This action by virtue of the beveled edge *w* of the swaging-ring deflects inwardly the turned-up edge of the bottom, and by virtue of the beveled ridge of the follower deflects outwardly that portion of the body or blank form which extends above the lower beveled edge of the swaging-ring, as well as the projecting end of the handle, and the joint shown in detail in Fig. 3 is thereby formed. The springs B B have thus far been sufficient to prevent the downward movement of the casing. Continuing the pressure, however, these springs yield, and the casing and all its contents are forced downward, the interior swaging-block D preventing any lateral deflection or bulging of the body or form. This action by virtue of the grooved shoulder *c*, against which the end of the body is forced, curls outward the edge of the body around the wire and the other projecting end of the handle. The cup is now complete and may be removed by swinging open the casing. The above operations are all performed by a single stroke of the press, and a perfectly water-tight joint is obtained without the use of any solder.

It is obvious that the upper edge of the cup or other vessel may be curled without wire, and also that the cup may be formed without a handle by simply leaving out these parts. It is also obvious that if it be desired to put a top to fruit or other cans the same may be done by operating on the upper part of the vessel only, as before described.

I have shown in Fig. 4 a means for forming by a second operation a double-seam joint in the bottom of the cup or can, if such should ever be desired, by substituting for the follower H, after the operation described, a follower of the form shown at H'. In this case the vertical flat-faced flange or rib *h* is forced down upon the edge of the can and the joint shown in Fig. 5 is thereby formed.

Although I have illustrated my invention in connection with the manufacture of a cylindrical can, it can be used in the manufacture of sheet-metal vessels of various kinds and of different shapes.

Having now described my invention, what I claim is—

1. A die for crimping and swaging the bottoms onto sheet-metal vessels at one operation, which consists in the combination of the base-piece upon which the vessel rests, a hollow die-casing suitably mounted on the base-piece and surrounding the vessel, and having an interior beveled recess near one end, and an exterior swaging block or follower adapted to support the bottom for the vessel and having a beveled face corresponding with the beveled recess of the die-casing, substantially as set forth.

2. A die for crimping and swaging bottoms onto tubular sheet-metal vessels at one operation, which consists in the combination of a base-piece or support upon which the vessel-body rests, a hollow die-casing surrounding the vessel-body and having an interior beveled recess at one end, opposite which the edge of the vessel-body extends, and an exterior swaging-block or follower having a rib with a beveled face corresponding to the beveled recess of the die-casing projecting from its face, the said rib being of less diameter than the vessel-body, whereby the edge of the vessel-body is forced outward onto the recess in the die-casing by the exterior swaging-block, substantially as set forth.

3. A die for crimping and swaging the bottom onto sheet-metal vessels at a single operation, which consists in the combination of a base-piece or support, a hollow casing suitably mounted thereon and having an interior beveled recess near its top, an interior swaging-block for preventing bulging of the vessel during the crimping and swaging operation, held in position by a spring, and an exterior swaging-block or follower having a beveled under surface corresponding with that of the hollow casing, substantially as described.

4. A die for curling the ends of tubular sheet-metal vessels, which consists in the combination of a base-piece or support, a curling-block suitably secured thereto, having a curved annular shoulder on which the end of the vessel rests, a hollow movable casing surrounding the curling-block and vertically guided thereby, and a follower for forcing the edge of the vessel down upon the curved shoulder of the curling-block, substantially as described.

5. A die for curling the ends of sheet-metal vessels, consisting of the combination of a base-piece or support, a curling-block suitably secured thereto, extending into the interior of the metal vessel, and having a grooved annular shoulder, a hollow casing surrounding the curling-block, mounted upon springs in the base-piece, and capable of free vertical or longitudinal movement, an interior vertically-movable block for preventing bulging of the vessel during the curling operation, and an exterior block or follower H, for forcing the vessel down upon the curling-block, substantially as described.

6. A die for crimping and swaging the bottom onto sheet-metal vessels and curling the top at a single operation, consisting of the combination of a base-piece or support, a curling-block secured thereto and having a grooved annular shoulder, a casing made up of two parts adapted to be joined together to form a continuous shell, mounted upon springs in the base-piece, capable of free vertical movement, and having a beveled recess near its top, an interior swaging-block for prevent-

ing bulging of the vessel during the crimping and swaging operation, and an exterior swaging-block having a beveled under surface corresponding with that of the hollow casing, substantially as described.

7. A die for crimping and swaging the bottom onto sheet-metal vessels, curling the top, and securing an ear or handle thereto at a single operation, consisting of the combination of a base-piece or support, a curling-block secured thereto and having a grooved annular shoulder, a casing made up of two parts, the parts being notched or cut away upon one edge for the reception of the ends of the handle or ear and adapted to be joined together to form a continuous shell mounted upon springs in the base-piece and capable of free vertical movement, a swaging-ring, also formed of two parts, fitting the upper shouldered recess of the casing, an interior swaging-block for preventing bulging of the vessel during the crimping and swaging operation, and an exterior swaging-block or follower having a beveled under surface corresponding with that of the swaging-ring, substantially as described.

8. A die for forming a double-seam joint at the top or bottom of sheet-metal vessels, consisting of the combination of a base-piece or support, a hollow casing surrounding the vessel and having a recessed end, an interior block arranged above the recess, and an interior crimping or swaging block moving in and guided by the recess, substantially as described.

9. The combination, in a die for securing the bottoms to metal vessels, of a hollow casing having an annular inclined face y and a portion beyond the said inclined face of greater diameter than the main portion of the casing, and a follower having an annular inclined face w, adapted to support a bottom having an edge flange adapted to move in the enlarged end portion of the die-casing and an adjacent beveled portion, substantially as set forth.

10. The combination of the hollow die-casing mounted upon yielding supports, a support for the metallic vessel, an exterior swaging-block constructed to bend and connect the edge of the metallic vessel to a bottom, and an internal yielding swaging-block, substantially as set forth.

11. A swaging-die provided with a two-part hollow casing adapted to receive a metallic vessel and provided with a recess or recesses for the passage of a handle or similar attachment, and a follower co-operating with the die-casing for crimping together the body of the metallic vessel and its bottom, substantially as set forth.

12. The combination, in a swaging-die, of a support for a metallic vessel, having an annular grooved bearing for the end of the body of the metallic vessel, a hollow die-casing provided with an annular inclined face or shoulder y adjacent to the other end of the vessel-body, and a follower or exterior swaging-block having an annular inclined face w, co-operating with the face y, substantially as set forth.

13. The combination of the die-casing recessed near one end, a detachable swaging-ring G, recessed interiorly and provided with an annular beveled edge y, fitting in the recessed portion of the die-casing, and a follower H, provided with an inclined face w, substantially as set forth.

14. The combination of the two-part die-casing E, recessed at its upper end, the detachable swaging-ring G, mounted in the recess of the casing, an exterior swaging-block or follower, and an interior swaging-block D, arranged opposite the swaging-ring, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES R. PADDACK.

Witnesses:
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