F. MARQUET.

MAKING METALLIC CANS.

No. 180,356. Patented July 25, 1876.

Fig. 2.

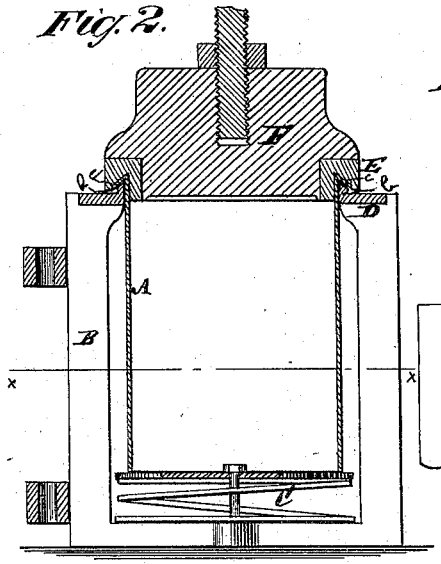


Fig. 1.

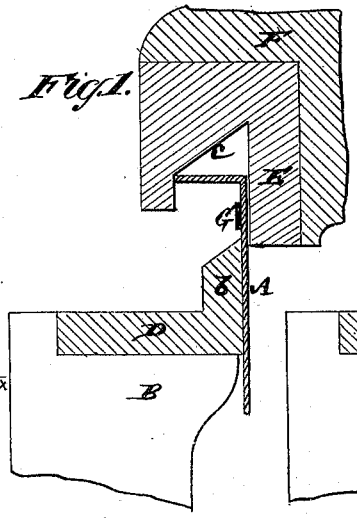


Fig. 4.

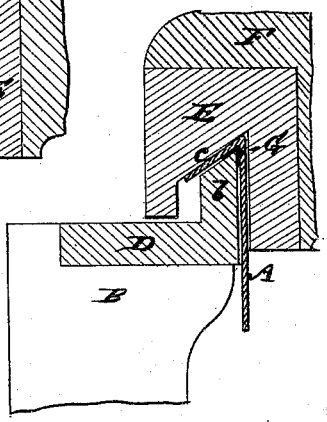


Fig. 3.

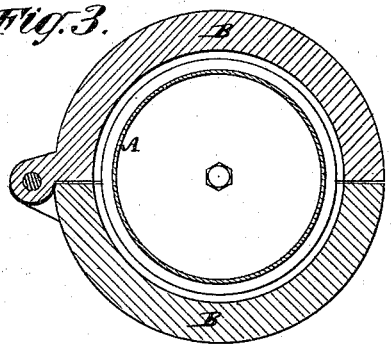


Fig. 5.

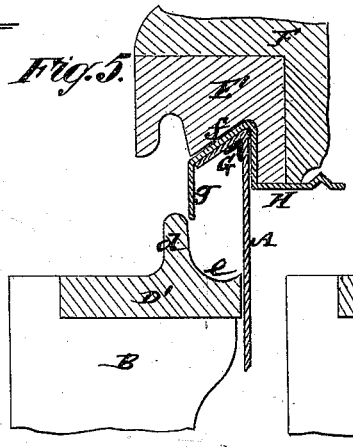


Fig. 6.

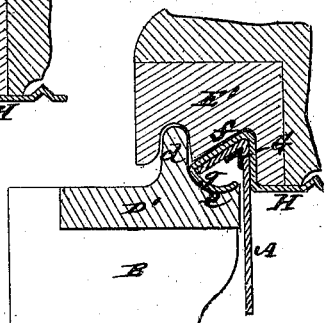


Fig. 7.

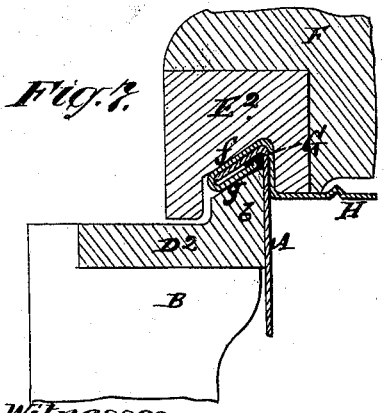
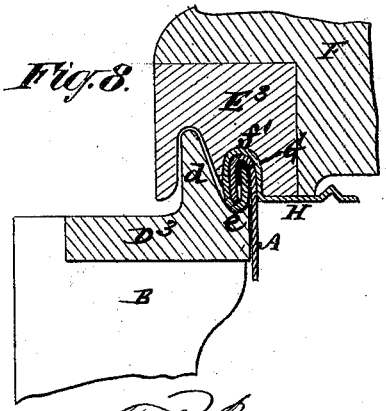


Fig. 8.



Witnesses
John Becker
Jno. Haynes

Felix Marquet
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

FELIX MARQUET, OF ETEL-MORBIHAN, FRANCE.

IMPROVEMENT IN MAKING METALLIC CANS.

Specification forming part of Letters Patent No. 180,356, dated July 25, 1876; application filed June 23, 1876.

To all whom it may concern:

Be it known that I, FELIX MARQUET, of Etel-Morbihan, in the Republic of France, have invented certain Improvements in the Manufacture of Metallic Boxes or Cans; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

One of the objects of this invention is to produce hermetically-sealed cans or boxes for preserving fruits, meats, and other articles or substances without resorting to the use of solder for closing the joints formed by the junction of the ends of the box or can with its body. For this purpose I unite the cover and bottom or ends of a metallic box or can with the body thereof by a process of setting said ends in and uniting them with the body by an outside joint, requiring neither fire nor solder to close it, but which is closed by a series or succession of bending and folding operations in dies, by a direct pressure or action.

The invention consists in a certain combination of peculiarly-constructed dies for thus successively operating on the ends of the body of the box or can, and on the edges of the cover, fitting the same to close the ends of the can by direct pressure of said dies or said end and edges. The joint thus formed is on the outside of the can; and to insure its effectual closing it is proposed to incorporate with said joint a soft or flexible interposed strip, having an insoluble coating applied to it, as well as to the metallic portions of the joint.

Figure 1 is a vertical section of a pair of dies, in part, used in the preliminary stage of the work. Fig. 2 is a vertical section, upon a smaller scale, of a means or apparatus fitted with like dies, but showing the latter as closed on the work; and Fig. 3 a horizontal section on the line *x x*. Fig. 4 is a vertical section, upon a larger scale, of the same dies, in part, and when closed. Figs. 5 and 6 are vertical sections of a succeeding pair of dies, in part, in their open and closed conditions. Fig. 7 is a further like view of another and following pair of dies, in part, used in the production of the joint; and Fig. 8, a similar view of still another or finishing pair of dies as in the act of closing the joint.

Referring to the accompanying drawing, I first take the body A of the metallic box or can and dip its opposite end edges successively in strong glue or other analogous substance, dissolved in acetic or pyroligneous acid. This forms a coating, which is allowed to dry, and materially assists in forming the joint, irrespective of the shape or construction of the latter, inasmuch as it not only protects the joint against being attacked by oil or other matter forming part of the contents of the can, but insures absolute tightness for the joint.

The means used for fitting on the body of the can its bottom and top or end covers successively consist, in part, of a body metal holder or frame, B B, which may be made in halves or sections, hinged together longitudinally, to provide for the entry and removal of the can. At the bottom of this frame is a spring, C, which serves to raise the box or can after each joint forming or closing action of an upper die, as hereinafter described.

On the upper part of the frame B B is a steel ring or lower die, D, made in the form of a gutter or ledge, the raised portion *b'* of which serves, in conjunction with an upper movable die, E, to bend over the upper exposed end of the can-body, and to give proper form or direction to a soft or flexible strip or band, G, placed around the body of the can; at least such is the action of the dies, as represented in Figs. 1, 2, and 4 of the drawing. This strip or band G may be made of gutta-percha or other suitable substance made insoluble in fatty matters, for which purpose it may be dipped in strong glue dissolved in acetic or pyroligneous acids.

The die E, Figs. 1, 2, and 4 is attached to a follower, F, which is raised and lowered by any suitable means. This die is constructed to fit freely over and receive within it the upright portion *b* of the lower die D, which portion is made sloping downward in an outward direction on its upper edge, and the portion or surface *c* of the upper die which lies over said edge of the lower die is made to correspond, but longer, so that as the two dies come to-

gether they not only give an angular outer bend to the exposed end of the can-body, but also a similar bend over the strip or band G, which lies in the sharp angle formed in the bent edge of the can-body by the action of the dies. Fig. 1 shows the dies before they are closed in thus operating on the can-body and its surrounding flexible band, and Figs. 2 and 4 the same after they have been closed.

Referring in the next instance to Figs. 5 and 6 of the drawing, I next place the can-body thus prepared or formed for making the joint in a similar frame or holder, but with its stationary die D′ constructed with an upright flange, *d*, rounded on its upper edge and joined at its base internally by a hollow or channel, *e*, and having its upper or movable die E′ constructed to freely fit over the upper portion of the flange *d*, and with an enlarged angular recess, *f*, over the hollow *e*, said angular recess conforming with the angular bend previously given to the end of the can-body. I then place the stamped metal cover H over the exposed bent end or edge of the can-body, as represented in Fig. 5, said cover being made to fit within the can-body and to conform to its outer bent end, which it overlaps, and so that it presents an outer downwardly-extending cylindrical portion, *g*. The upper die E′ is then brought down, as shown in Fig. 6, to commence the rolling of the edge of the cover by causing the portion *g* of the cover to conform to the hollow or channel *e* of the die D′, the upper die E′ first pressing by its lower extremity or portion upon the cover H to force or hold it within the body of the can. Under this pressure or action, and by the lowering of the spring C, the portion *g* of the top or bottom cover H is folded against or toward the body of the can by turning in its inner edge, causing said portion *g* to take the form of a small volute.

The next stage in the process is to place the body A with the cover H on it in a similar frame, holder, or apparatus, to that shown in Fig. 2, having substantially similar dies D^2 E^2, so that when the die E^2 is brought down, as represented in Fig. 7, the volute or portion *g* of the cover is compressed to bring it in contact with the band or strip G, and to lap the outer edge of the cover under the overhanging end of the body with said band or strip bent in between them at the inner edge of the cover.

The concluding stage in the process is to put the can-body, with its cover combined therewith, as described, in a further similar frame or holder, as before, but having its die D^3, Fig. 8, constructed somewhat similar to the die D^1, shown in Figs. 5 and 6, but with its upper flange *d* inclined on its inner surface, thickening toward the base of said flange, and with a smaller channel, *e*, at said base; also the upper die E^3 constructed to conform to said upper flange, and with an inverted U-shaped recess, *f*′, in place of the enlarged angular recess *f* of the die E^1. Thus arranged, pressure is applied to the die E^3, causing the dies D^3 E^3 to have the effect of closing the portion *g* of the cover up against the body of the can, and forming a folded lap-joint of the body and cover, with the interposed band or strip G covering the inner edge of the cover, as shown in Fig. 8. This completes the closing of the can at its end.

By employing a series of dies operating as described to turn in or over the edges of the metal, which is compressed by the dies, I avoid that drawing of the metal which is incidental to the employment of rollers for such purpose, and which has the effect of circumferentially lengthening the metal at the joint.

I claim—

1. The combination of the dies D E D^1 E^1 D^2 E^2 and D^3 E^3, constructed substantially as herein described for successive operation on the ends of the body of the box or can, and on the edges of the covers fitting the same, to close the ends of the can by direct pressure of said dies on said ends and edges, essentially as specified.

2. The combination of the soft or flexible band or strip G, having an insoluble coating of glue, dissolved in acid or its equivalent, applied to it with the folded lap-joint of the body and cover of the can, and arranged so that the interposed flexible band or strip laps over and receives within it the inner edge of the cover H of the can, substantially as shown and described.

FELIX MARQUET.

Witnesses:
F. X. DÉVINE,
DEMOILLE.