A. A. C. APPERT.

SHEET-METAL CANS.

No. 178,501. Patented June 13, 1876.

Fig. 1.

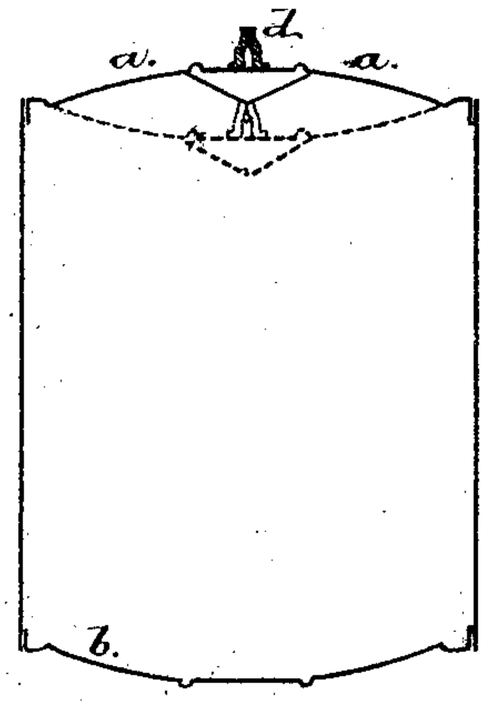


Fig. 5.

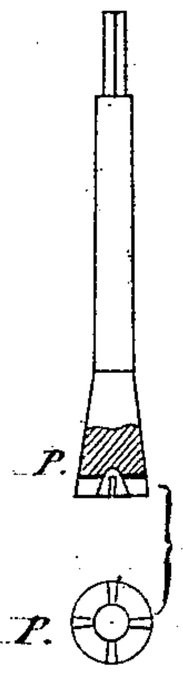


Fig. 6.

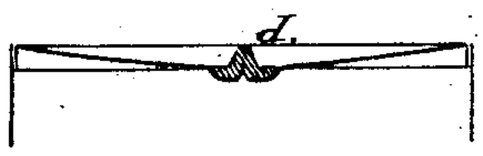
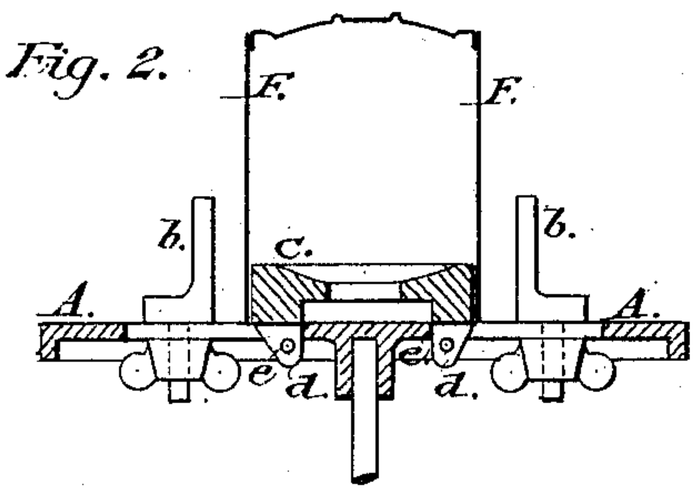


Fig. 3.

Fig. 2.



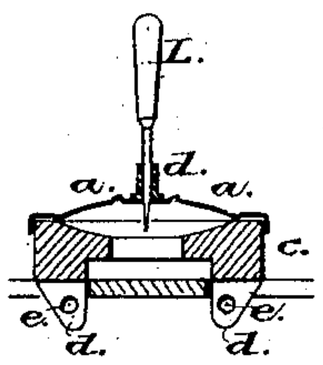
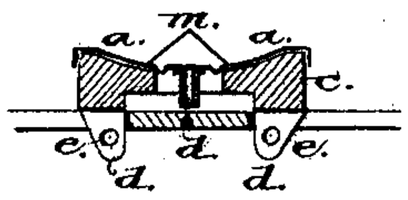


Fig. 4.



Witnesses:

Emile Bonnet

Aug. Vinck

Inventor:

A. A. C. Appert

UNITED STATES PATENT OFFICE.

ALFRED AUGUSTE CHEVALLIER-APPERT, OF PARIS, FRANCE.

IMPROVEMENT IN SHEET-METAL CANS.

Specification forming part of Letters Patent No. **178,501**, dated June 13, 1876; application filed March 11, 1876.

To all whom it may concern:

Be it known that I, ALFRED AUGUSTE CHEVALLIER-APPERT, of Paris, France, have invented certain new and useful Improvements in Sheet-Metal Cans for Preserving Food, of which the following is a specification:

My invention in sheet-metal preserving-cans is an improvement on the system of Appert and Fastier, now in extensive use.

In the arrangement of the metallic can with leaden tube in the Fastier system, several serious inconveniences are experienced. There is a considerable loss of material in consequence of the discharge of the juice or liquid essence of the meats, which escapes with the steam during the boiling operation. The sides of the can are also apt to buckle in, in consequence of the great difference existing between the external atmospheric pressure and the internal pressure when the gases within the can cool. The cans also are never full when opened. Moreover, difficulty is experienced from the projection of the tube above the plane of the top of the can. This prevents the cans from being closely and compactly packed, and often necessitates the employment of a hood or covering capsule for the tube.

My invention has for its object the removal of these difficulties; and to this end it consists of a metallic can provided with convex depressible ends, in one of which is a soft-metal tube and a valve, as hereinafter specified.

The employment of flat plane plates for closing the ends of the can was in reality the prime cause of all the inconveniences above named; but it is only after long and careful study that I have discovered that the same may be obviated or ameliorated to a great extent by the simple modification of employing convex or bulging end plates. A brief consideration of the matter will suffice to explain why this result is attained. In the first place, the loss of juices, while not completely suppressed, is greatly diminished, because this convex form facilitates the formation, on the under side of the top, of liquid drops, which fall back into the body of the can while the gases escape. Then the can, by the use of the convex ends *a* and *b*, has increased capacity without change in its dimensions, and this construction offers the great advantage that when the cooking or boiling operation is completed, and the tube *d* closed, a light pressure on the ends will suffice to depress them, and to cause them to assume a concave form, as shown in the drawing, where the depressed top is indicated by dotted lines.

By this operation I diminish notably the interior space occupied by the gases, and augment the internal pressure to such an extent that the difference between the internal and external pressures is no longer noticeable, and I thus prevent the buckling of the sides of the can. Finally, and this is practically one of the most important results, I am enabled to pack the sealed cans closely, because when the top is depressed it carries with it the tube, which no longer, therefore, projects above the top of the can, so that the cans may be superposed one on the other readily and without any loss of space.

To facilitate the manufacture of my improved form of can, I have been compelled to devise new apparatus, which may be best described by reference to the accompanying drawing.

Figure 2 is a section of the table of an ordinary soldering apparatus.

In the manufacture of cans with flat bottoms, it suffices to place the can on the table A, and to hold it in place by means of adjustable feet or clamps *b* during the soldering of the ends; but with my cans I have encountered much difficulty in using the ordinary soldering apparatus for the soldering to the cover of the tube *d* and the valve *m*, which is located on the under side of the cover, below the tube. This difficulty I have overcome by the employment of a mandrel, *c*, having a top concave to correspond with the convexity of the can top, and having an opening through its center for the purpose hereinafter described. This mandrel is fixed to the table A by means of feet *d* and pins *e*. By removing the latter, the mandrel can be disengaged from the table whenever it is so desired. In order to solder the bottom *b* to the sides of the can F, it is only necessary to place the can in the position shown in Fig. 2, with its open end resting on the table and fitting the mandrel. To solder the tube *d* to the cover *a*, the cover is put on the mandrel in the position indicated in Fig.

3. I then, by means of a punch, L, on which is previously fitted a short tube, *d*, pierce the center of the cover, which is ascertained by a mark made when the cover is stamped up. While the punch thus remains in the cover and centers the tube *d*, I solder the latter to the cover. There is thus no danger of the tube and hole in the cover not registering. When the solder is sufficiently set I remove the punch and place the cover bottom upward in the mandrel, as shown in Fig. 4. The cover fits in the concave face of the mandrel, and the tube *d* is received in the central depression or opening in the mandrel. The valve *m* is then soldered to the cover in the usual way.

The mandrel thus serves for all the operations necessary in the preparation of the can.

In order to still further facilitate the work, I can mount a series of soldering devices on a circular revolving frame. A number of cans previously positioned can thus be brought in succession before the solderer, who will operate on each, and then leave the after care of them to an attendant.

It has heretofore been customary to close the tube *d* by means of pinchers; but in order to escape all danger of accident which might result from any sudden blow which would tend to bend the tube and to permit access of air to interior of the can, I employ with advantage a mode of closing the tube which consists in giving it, by means of a tool, P, Fig. 5, specially designed for the purpose, the form of a conical teat, as seen in Fig. 6, which projects comparatively little from the cover. A rapid rotary movement is communicated to the tool P by suitable means, the effect of which is to consolidate and squeeze together the lead tube, and reduce it to the condition of a solid conical teat, as shown, which possesses the double advantage of hermetically sealing the can and of diminishing the extent to which the tube projects above the cover.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

A metallic can provided with convex depressible ends, in one of which is a soft-metal tube and a valve, as and for the purposes specified.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

A. A. CHEVALLIER-APPERT

Witnesses:
EMILE BARRAULT,
AUG. VINCK.