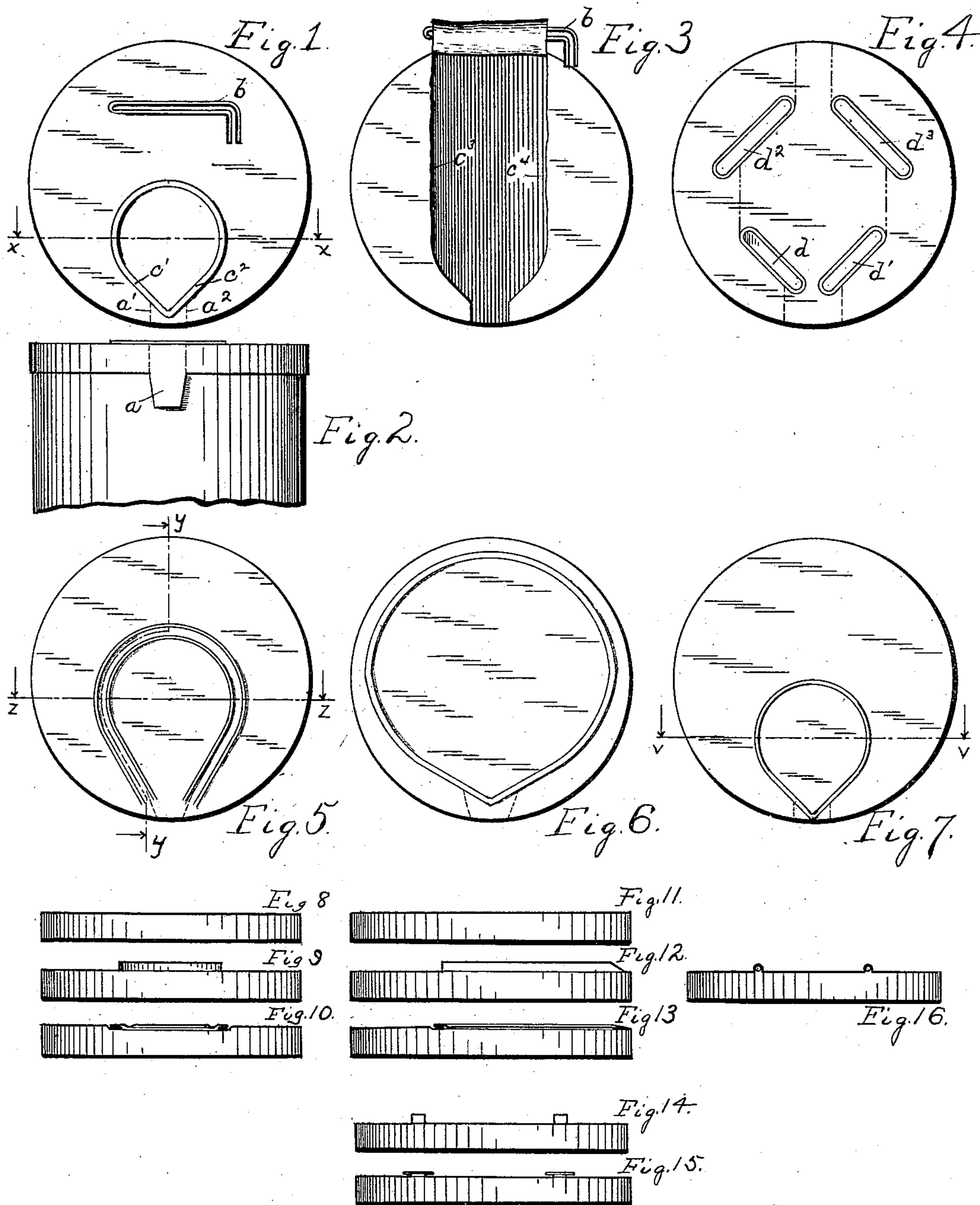


(No Model.)

E. BARRATH.
SHEET METAL CAN.

No. 507,307.

Patented Oct. 24, 1893.



Witnesses.
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UNITED STATES PATENT OFFICE.

EDWARD BARRATH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE VICTOR KEY-
OPENING CAN AND MACHINERY COMPANY, OF SAME PLACE.

SHEET-METAL CAN.

SPECIFICATION forming part of Letters Patent No. 507,307, dated October 24, 1893.

Application filed June 16, 1893. Serial No. 477,823. (No model.)

To all whom it may concern:

Be it known that I, EDWARD BARRATH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sheet-Metal Cans, (Case No. 6,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to sheet metal cans, and, more particularly, to the class designated as key-opening sheet metal cans, in which a free lip is provided adapted to be grasped to remove a portion of the metal of the can.

The object of my invention is to produce a key-opening can in which a portion of the cover with a width greater than that of the free lip may be removed along lines positively determined in the construction of the can, and without liability of tearing the cover along lines not predetermined.

My invention consists, first, in a can provided with a free lip upon the cover thereof, and with lines of reduced strength extending from the edges of said free lip to oblique lines of increased strength, whereby the shape of the portion of the cover removed may be determined by the position of the lines of increased strength.

My invention consists, second, in a method of strengthening portions of the sheet metal of which a can may be made, which method consists, first, in throwing up by means of dies an interior portion of metal to form an interior raised portion, and then flattening said raised portion by means of flat dies, whereby the edges of said raised portion are caused to overlap to form a fold of triple thickness in the metal of a contour corresponding to the contour of the raised portion of metal.

My invention consists, third, in such details of construction as will hereinafter be described.

Heretofore it has been proposed to form key-opening sheet metal cans so that a portion of the cover can be removed by weakening the cover along lines extending from the edges of the free lip, toward the interior portion of the cover, the lines of reduced strength then diverging, whereby a portion of the

cover, greater in width than the width of the free lip, may be removed. Such a construction is described in Letters Patent No. 449,136, granted to Frederick Reiset and Gustave A. Waeber. A difficulty I have found in connection with cans, as thus constructed, is that when the cover has been torn along the lines of reduced strength until that point is reached where said lines begin to diverge rather abruptly, the lines of tear instead of following the weakened portions, continue more or less in their established directions, and tear into the unweakened portion of that part it is desired to remove.

By my invention I am enabled to dispense with all weakened lines except those extending from the edges of the free lip to the point where it is desired that the lines of tear should begin to diverge, and even these in some cases might be dispensed with, and in place thereof, I provide lines of increased strength forming oblique abutments with which the lines of tear come in contact and by means of which said lines of tear are deflected, following the edges of said lines of increased strength.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a top view of a can embodying my invention. Fig. 2 is a partial side view thereof. Fig. 3 is a top view of the can illustrated in Fig. 1 showing the removable portion of the cover torn away. Fig. 4 is a modification of my invention, in which the lines of increased strength are formed by operating upon several distinct portions of the cover. Fig. 5 is a modification of my invention, in which two parallel lines of increased strength are formed on the cover between which the tear is adapted to be made. Fig. 6 is a modification illustrating a construction whereby the entire top of the cover is adapted to be removed. Fig. 7 is a modification in which the lines of increased strength are formed by forming a ridge in the metal and securing a metallic wire in the same. Figs. 8, 9, 10, are sectional views of the can cover on line $x-x$ of Fig. 1, illustrating the different steps in the formation of the lines of increased strength. Figs. 11, 12, 13, are sectional views on line $y-y$ Fig. 5, illustrating

the different steps in the formation of the lines of increased strength as illustrated in said figure. Figs. 14 and 15 are sectional views upon line $z-z$, Fig. 5, illustrating the different formation steps. Fig. 16 is a sectional view upon line $v-v$, Fig. 7.

Like letters refer to like parts throughout the several figures.

The can cover is provided with a free lip a which extends beyond the edge of the rim and which may be grasped by a key, b , to remove the removable portion of the cover. Extending from the edges of said lip are lines of reduced strength a' , a^2 , which extend as far as the lines of increased strength c' , c^2 . When it is desired to open the can the lip a is grasped by a key b and a pull is exerted thereon causing the cover to tear along the lines of reduced strength a' , a^2 until the lines of increased strength c' , c^2 are reached, when the lines of tear will follow said lines c' , c^2 until that part of the cover is reached at which said lines c' , c^2 are farthest apart, when the lines of tear will continue along some such lines as c^3 , c^4 .

The key I preferably use is illustrated in Fig. 1, and consists of a wire bent upon itself, the ends of the wire being bent at right angles to the remaining portion to form a handle. In using the key, the lip a is passed between the parallel portions of the key, after which said key is given a slight rolling motion, whereby the lip is rolled upon the same. A firm connection between the key and the lip being thus established the removable portion of the cover may be either rolled upon the key or torn away from the remainder of the cover by a simple pulling movement.

The lines of increased strength may be formed in a variety of ways. The method I prefer, however, consists in forming a fold of triple thickness in the metal, as I will now proceed to describe. In forming the cover I preferably first form the rim around the same, as shown in Fig. 8. The cover is then placed between a set of dies and an interior portion of the same is thrown up, as illustrated in Fig. 9, the thrown up portion being provided with vertical sides. The next operation consists in pressing back the thrown up portion by means of a pair of flat dies, during which operation the vertical sides of the thrown up portion are caused to buckle outward, the result being, as shown in Fig. 10, a fold of triple thickness surrounding the portion of the cover that was in the first place thrown up. The contour of the thrown up portion may be varied to suit the requirements of any particular case. In Fig. 1, I have illustrated the thrown up portion as circular in general outline, the sides to which the weakened lines extend forming tangents to the remainder of the curve so that the weakened lines extending from the edges of the free lip may meet the lines of increased strength obliquely.

In Fig. 4 the lines of increased strength are formed by throwing up portions of the cover separately. Thus the portions d , d' are formed obliquely to the lines of reduced strength, thus determining the width of the portion that will be torn away, while the portions d^2 , d^3 are formed obliquely in a reverse direction and extend somewhat farther to the side so that the lines of tear will be so directed that a spoon shaped opening will result.

In Fig. 5 the strengthened portion is formed by throwing up a channel of horse-shoe shape and then pressing the raised portion back again to form two parallel triple folds. In order that the fold may not be formed at the ends of the channel said ends are thrown up at an angle, as shown in Fig. 12, so that when the raised portion is pressed down the metal is merely pressed back to place without forming a fold, as would have resulted if the ends had been thrown up vertically. The lines of reduced strength are extended from the edges of the free lip to a position between the two lines of increased strength, so that when the free lip is grasped the lines of tear follow the weakened lines so far as they extend and are then guided by the parallel lines of increased strength. In this construction the shape of the portion torn away will be determined by the shape of the channel which is in the first place thrown up.

As will be seen from the drawings my invention is susceptible of many modifications in matters of detail, and I do not therefore wish to be limited to specific constructions, but desire to claim the invention broadly.

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

1. In a key-opening can, the combination with a free lip, of divergent lines of increased strength, and lines of lesser strength extending from the edges of said free lip and abutting against said divergent lines, thereby causing the lines of tear following said lines of lesser strength to diverge on reaching said divergent lines of increased strength, substantially as described.

2. In a key-opening can, the combination with verging lines of increased strength, of a free lip, and lines of tear extending from the edges of said free lip and abutting against said verging lines, thereby causing the lines of tear to verge upon meeting said verging lines of increased strength, substantially as described.

3. In a key-opening can, the combination with oblique lines of increased strength formed by a fold of triple thickness in the metal of said can, of a free lip, and lines of reduced strength coextensive with the edges of said lip and extending toward said lines of increased strength, substantially as described.

4. The herein described method of forming a fold of triple thickness in metal plate, which consists in first throwing up a portion of the

interior metal thereof to form a raised portion having sides approximately perpendicular to said plate, and then pressing said raised portion back again, thereby causing said perpendicular sides to buckle and form a fold of triple thickness in the metal, substantially as described.

5. The herein described method of forming lines of increased strength in metal plate, which consists in throwing up a portion of the metal and then pressing the same back again, thereby stretching the metal bounding said raised portion and causing the same to buckle, substantially as described.

6. The herein described method of forming lines of increased strength in metal plate, which consists in throwing up an interior portion of the same so that the sides of said thrown-up portion may be perpendicular to the surface of the plate at points where it is desired to produce lines of increased strength, and oblique thereto at points where it is desired not to produce such lines, and then pressing said thrown-up portion back, there-

by causing said perpendicular sides to buckle and form a fold while said oblique sides are pressed back into their former positions without forming folds, substantially as described.

7. In a key-opening can, the combination with lines of tear extending from the edges of a free lip, of lines of increased strength placed obliquely in the paths of said lines of tear, thereby causing said lines of tear to follow the direction of said lines of increased strength, substantially as described.

8. In a key-opening can, the combination with a line of lesser strength, of a line of increased strength placed obliquely in the path of said line of lesser strength, thereby deflecting a line of tear following said line of lesser strength, substantially as described.

In witness whereof I hereunto subscribe my name this 2d day of May, A. D. 1893.

EDWARD BARRATH.

Witnesses:

CHARLES O. JOHNSON,
W. CLYDE JONES.