(No Model.)

E. NORTON.

TIN CAN.

No. 475,336. Patented May 24, 1892.

Fig. 1.

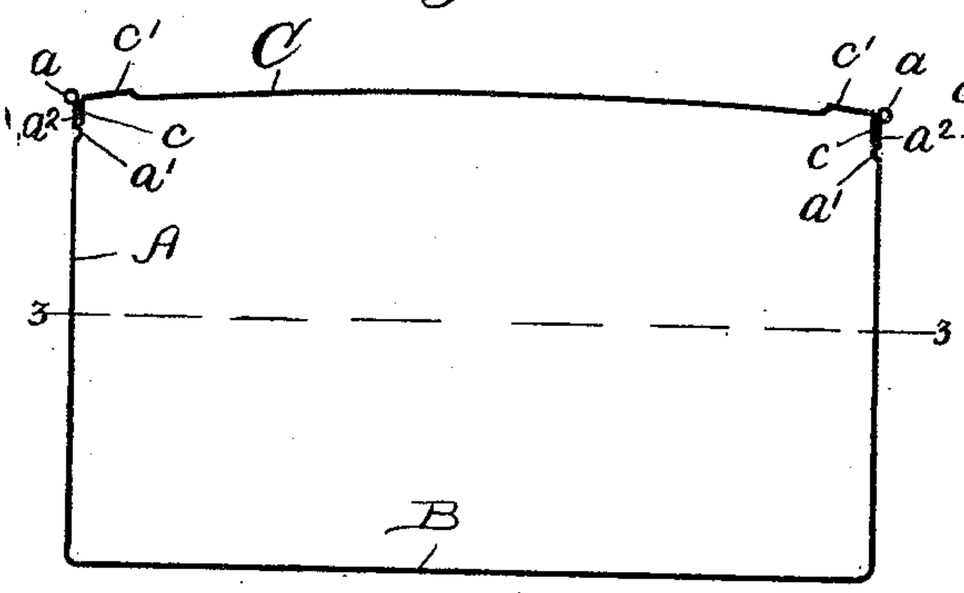


Fig. 2.

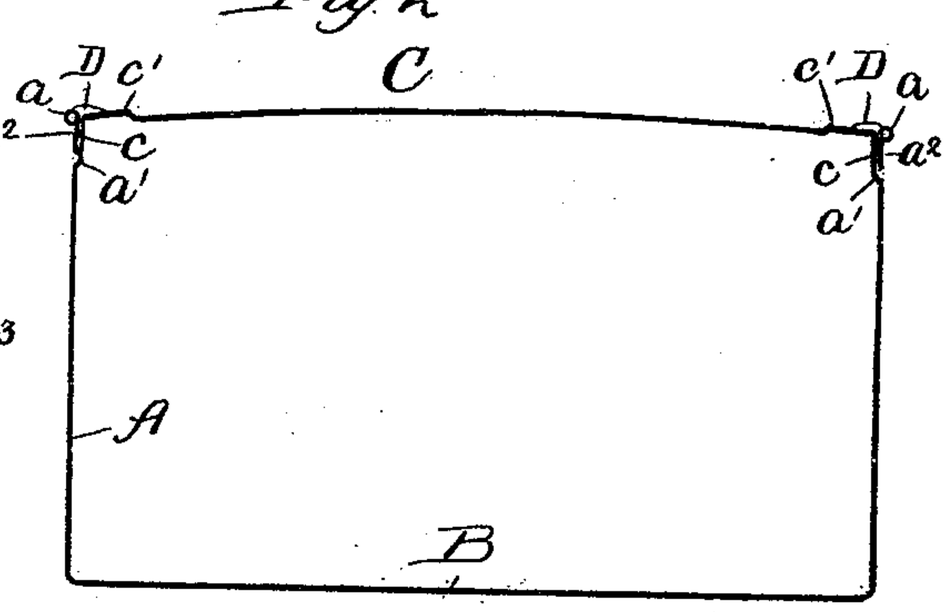
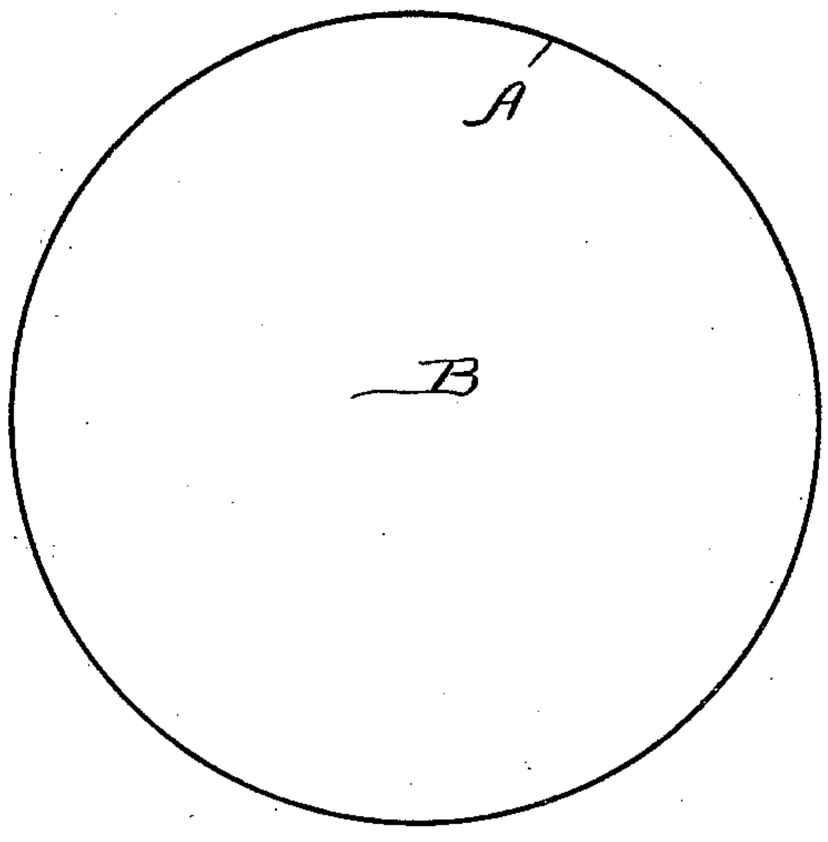


Fig. 3.



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UNITED STATES PATENT OFFICE.

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TIN CAN.

SPECIFICATION forming part of Letters Patent No. 475,336, dated May 24, 1892.

Application filed February 20, 1892. Serial No. 422,196. (No model.)

To all whom it may concern:

Be it known that I, EDWIN NORTON, a citizen of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Tin Cans, of which the following is a specification.

My invention relates to the construction of tin cans which are adapted to be hermetically sealed and which are used for putting up fruits, vegetables, condensed milk, fish, meats, and other hermetically-sealed goods. Cans of this class are made of tin-plate—that is, thin sheets or plates of iron or steel coated on both sides with tin. In the manufacture of these cans the tin-plate is necessarily manipulated cold or at such low degree of heat as will not melt the tin-coating and thus destroy, injure, or discolor the plate or material out of which the can is made. These cans are used simply as a wrapper or casing for the goods which are sold in them, the can being of no value after it is once opened; and one of the necessities of the manufacture therefore is that the cans be made very cheap, as any construction of can which would be expensive to make would, on this ground alone, be an absolute failure and impracticable and could not be used. As the practical sale-value of a can of ordinary size—say a one-pound, two-pound, or three-pound can—is only a fraction of a cent more than the cost-value of the tin-plate or material used in its construction, it is obvious that the construction of a practical or successful can must be such that good or perfect cans may be made with uniformity and certainty—that is to say, without any appreciable percentage of defective or spoiled cans or injured stock in the process of manufacture. If, for example, the construction of the can were such that with ordinary care only ninety or ninety-five perfect cans could be made out of a hundred, the tin-plate or stock of the remaining five or ten being spoiled, that construction of can would necessarily be, from this reason alone, entirely impracticable and a failure. For economy in the amount of material or stock necessary to make a can of a given capacity and for convenience and economy in packing the cans in cases for shipment and for safety in shipment, especially when the cans are filled, these cans are usually made of cylindrical form, and for the same reasons the height or length of most cans equals or exceeds their diameter, though a limited number of cans commonly called "flats" are used for certain special purposes in which the height or length is somewhat less than the diameter of the cans. Heretofore these cans have been usually made of three separate pieces or blanks of tin-plate, one piece being a rectangular blank which is folded into cylindrical form and its meeting edges soldered together to form the body or cylindrical portion of the can, and the other two blanks being cylindrical flanged disks, the flanges of which are soldered to the ends of the body portion of the can and constitute its two heads or its bottom and top. The cans made in this way necessarily have three soldered seams or joints, one being the side seam of the can-body and the other being the two end seams which unite the two heads to the can-body. This old construction of can can be made cheaply, but to do so requires large and expensive plants of labor-saving machinery, though even with such machinery the manufacture is attended with considerable labor and expense, owing to the great number of different manipulations or acts to be performed to make the cans, such as cutting the blanks, forming the can-body, soldering its side seam, assembling the heads and bodies and applying the heads to the bodies, soldering the end seam, and finally testing the can. The expense of the manufacture is also materially increased by the amount of solder and flux required for forming the several soldered joints. In the old construction of can there is also unavoidably some percentage of defective or leaky cans arising from defects in the soldering of some of the seams of the cans, and especially in the side seam or at the point where the end of the side seam is united to the flange of the head, as the folds or laps of the stock forming the side seam necessarily leaves a small crevice or shoulder between the flange of the can-head and the end of the can-body at this point. This crevice is sometimes not properly filled and closed by the solder in the operation of soldering the bead

upon the can-body, and, though this percentage of leaky or defective cans may be very small—say, for example, only five or six cans in one thousand—still it will be seen that this loss becomes a serious and heavy charge against the can-manufacturer and materially diminishes his legitimate profits in the business, when it is remembered that it is the general custom of the business or trade for the packer or user of the cans to charge back to the can-manufacturer as a rebate not only the cost of the leaky cans, but the value of the goods packed in such cans and spoiled by reason of the leaks. When the cans are filled with valuable goods, it often happens that the reclamations for leaks in a thousand cans exceeds over and over again the can-manufacturer's profit on the entire thousand. In this old construction of can having a soldered side seam and end seams there is also danger of injuring or tainting the contents of the can with the acid or the flux or solder used in soldering the seams, and which often to a greater or less extent flows through the soldered seams into the interior of the can, so that the contents of the can may come in contact therewith. This is of special importance in relation to condensed milk and other special articles of food which are commonly put up in cans.

The object of my invention is to provide an efficient and practical can made of tin-plate which in its construction and method of manufacture will obviate the objections to the old construction of can heretofore generally in use and which at the same time may be manufactured more cheaply.

To this end my invention consists in a drawn tin-plate can of cylindrical form having its bottom head and body all in one seamless piece, thus avoiding the soldered side seam of the can-body and also the soldered end seam for uniting the bottom head to the can-body.

It further consists in a drawn cylindrical can having its bottom head and body all in one seamless piece of tin-plate and furnished at its mouth or upper end with a rolled edge to strengthen the same and to enable the flange of the can-head to be readily placed on the can-body, while at the same time it fits the same tightly and snugly, so that a perfect soldered seam may be formed with certainty and uniformity between the smooth die-formed wall of the can-body and the similarly-die-formed wall or flange of the can-head. By this means I am enabled to produce such a tight close fit between the flange of the can-head and the end of the can-body that a comparatively small quantity of solder is required for forming this end seam, and so that there is little danger of any portion of the solder or flux coming in contact with the contents of the can. This latter result is also in part effected by an internal bead, which I form at the upper end of the can-body. This bead also constitutes a shoulder or stop for the lower edge of the flange of the can-head to fit against, and thus prevents the can-head being too far inserted in the can-body. By combining the die-made cover or can-head with the die-made or drawn can-body furnished with such rolled edge the fit between the can head and body may be made so tight and close that a practically liquid-tight joint may be formed simply by forcing the head in or upon the body and before the soldering is done, while at the same time, owing to the roll at the mouth or edge of the can-body, the head or cover may be conveniently and readily applied to the body. The rolled edge of the drawn can-body when combined with the head fitting inside the can-body also forms a guide or channel for the solder or soldering-tool in the operation of soldering the final head or cover in the can after the can has been filled. By combining the drawn or die-made can-body with the drawn or die-made cover I entirely avoid the shoulder or crevice caused by the side seam of the old cans and which heretofore has been such a frequent cause of leaky cans.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Figure 1 is a central longitudinal section of a can embodying my invention, showing the cover or top head in place before it is soldered. Fig. 2 is a similar section showing the cover soldered in place. Fig. 3 is a horizontal section on line 3 3 of Fig. 1.

In the drawings, A represents the body of the can, and B its bottom or lower head, both these parts being in one seamless piece or blank of tin-plate and formed into cylindrical shape by drawing the blank with suitable dies. As the tin-plate can-body A is die-made or drawn to the required shape, the can-bodies can be readily made of an exact size or diameter and perfectly true, so that a perfect fit may be produced between the same and the flange *c* of the die-made cover C. To facilitate the application of the tight-fitting die-made cover C to the die-made can-body A, the upper end of the can-body is furnished with a roll or turned edge *a*. The roll *a* is an external roll, as the flanged head C is designed to fit inside the can-body. The can-body is further provided with an internal bead *a'*, which in the combination of the can-body with the can-head serves as a shoulder or stop for the edge of the can-head flange *c* to rest against, and also to prevent any possibility of the solder or flux employed to solder the head C to the body coming in contact with the contents of the can. The outward roll *a* also serves in this combination to form a guide or channel for the solder and soldering-tool in the act of soldering the head upon the body. To better accomplish this latter result, also, the can-head C is provided with a slightly-inclined rim *c'*. The rolled edge *a* of the seamless can-body and rim *c'* of the can-head together constitute two opposing inclined sur-

faces, which serve to direct the solder into the seam or joint between the flange *c* of the can-head and the cylindrical wall a^2 of the can-body below the roll *a* and above the bead *a'*.

D represents the solder, which unites the seamless flange *c* of the die-made cover C with the seamless cylindrical wall a^2 of the die-made can-body A. The rolled or folded edge *a* of the can-body, it will be observed, gives the seamless die-made can-body a kind of tapering or wedging mouth, which very greatly facilitates the application of the like die-made can-head to the can-body and permits the two parts to be made very close and tight fitting, so that the parts may be perfectly soldered together with certainty and uniformity and by the use of a comparatively small quantity of solder. This wedging-mouth of the seamless die-made can-body, in connection with the seamless die-made cover, also causes or enables the cover when it is inserted within the can-body, after the latter is filled with food or other articles, to scrape or clean the mouth or wall a^2 of the can-body by the mere act of inserting the cover. This latter result is one of great practical utility and importance in the art of putting up hermetically-sealed goods, as it is very necessary in order to form a perfectly tight-soldered joint that the two tin-coat surfaces which are to be united by the solder should be perfectly clean and free from all substances which might interfere with the complete and perfect soldering of the parts together. This result is due to combining the seamless can-body with the seamless can-head, because if the can-body was provided with a side seam the crevice or shoulder formed by and left at the side seam would form a lodgment for dirt or material which could not be removed or scraped away by the flange or cover when it is inserted. As the internal bead *a'* forms a kind of inclined or wedging shoulder when the flange *c* of the head C is pressed home against this shoulder, the shoulder and flange together form a very close frictional contact with each other, uniform all around, as both parts are seamless, so that there is scarcely any possibility for the solder or flux to come in contact with the contents of the can.

I claim—

1. The drawn or die-made tin can for hermetically-sealed goods herein shown and described, and consisting of a seamless cylindrical body A and bottom head B, both said parts being drawn up out of one and the same piece or blank of tin-plate, and a die-made cover C, having a cylindrical flange *c* fitting the cylindrical body A at the mouth or end thereof and soldered or adapted to be soldered thereto, substantially as specified.

2. The drawn or die-made tin can for hermetically-sealed goods herein shown and described, and consisting of a seamless cylindrical body A and bottom B, both said parts being drawn up out of one and the same piece or blank of tin-plate, and a die-made cover C, having a cylindrical flange *c* fitting the cylindrical body A at the mouth or end thereof and soldered or adapted to be soldered thereto, said seamless body A having a rolled edge *a* at its end or mouth to facilitate the application of said cover-head C to the body, substantially as specified.

3. The drawn or die-made tin can for hermetically-sealed goods herein shown and described, and consisting of a seamless cylindrical body A and bottom B, both said parts being drawn up out of one and the same piece or blank of tin-plate, and a die-made cover C, having a cylindrical flange *c* fitting the cylindrical body A at the mouth or end thereof and soldered or adapted to be soldered thereto, said seamless body A having an externally-rolled edge *a* at the end or mouth thereof, and an internal bead *a'* to form a stop for the seamless flange *c* of said cover to fit against, substantially as specified.

4. The drawn or die-made tin can for hermetically-sealed goods herein shown and described, and consisting of a seamless cylindrical body A and bottom head B, both said parts being drawn up out of one and the same piece or blank of tin-plate, and a die-made cover C, having a cylindrical flange *c* fitting the cylindrical body A at the mouth or end thereof and soldered or adapted to be soldered thereto, said seamless body A having an externally turned or rolled edge *a* and said cover C having a slightly-inclined or flaring rim *c'* to form a guide or channel for the solder in soldering the cover-head C upon the body, substantially as specified.

5. The drawn or die-made tin can for hermetically-sealed goods herein shown and described, and consisting of a seamless cylindrical body A and bottom head B, both said parts being drawn up out of one and the same piece or blank of tin-plate, and a die-made cover C, having a cylindrical flange *c* fitting the cylindrical body A at the mouth or end thereof and soldered or adapted to be soldered thereto, said seamless body A having an externally turned or rolled edge *a* and said cover C having a slightly-inclined or flaring rim *c'* to form a guide or channel for the solder in soldering the cover-head C upon the body, and said body A being also provided with an internal bead or shoulder *a'* to form a stop for said flange *c* of the cover to fit against, substantially as specified.

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Witnesses:
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H. M. MUNDAY.