No. 820,976. PATENTED MAY 22, 1906.

E. KATZINGER.

METHOD OF MAKING PANS.

APPLICATION FILED SEPT. 22, 1904.

4 SHEETS—SHEET 1.

Fig. 1.

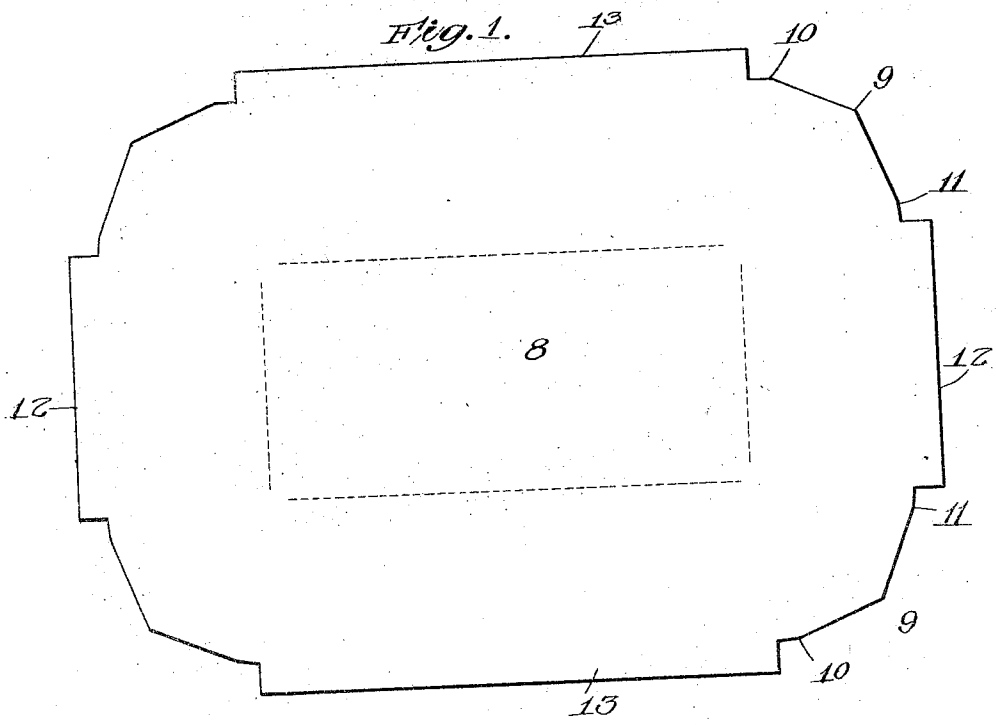


Fig. 2.

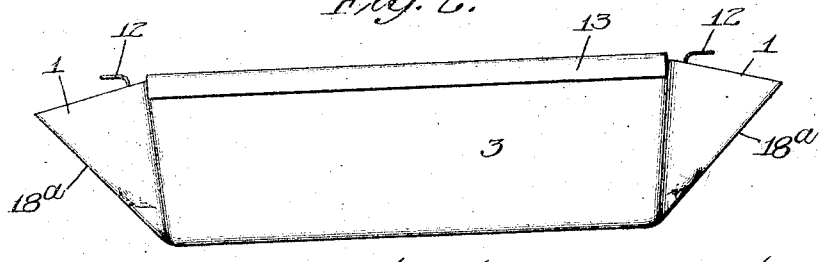
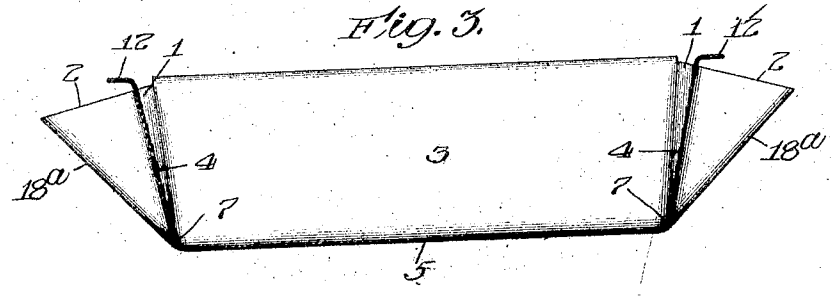


Fig. 3.



Witnesses:
Robert F. Weir
J. B. Weir

Inventor
Edward Katzinger
by Emmett & Hopkins
Attys

No. 820,976. PATENTED MAY 22, 1906.

E. KATZINGER.

METHOD OF MAKING PANS.

APPLICATION FILED SEPT. 22, 1904.

4 SHEETS—SHEET 2.

Fig. 4.

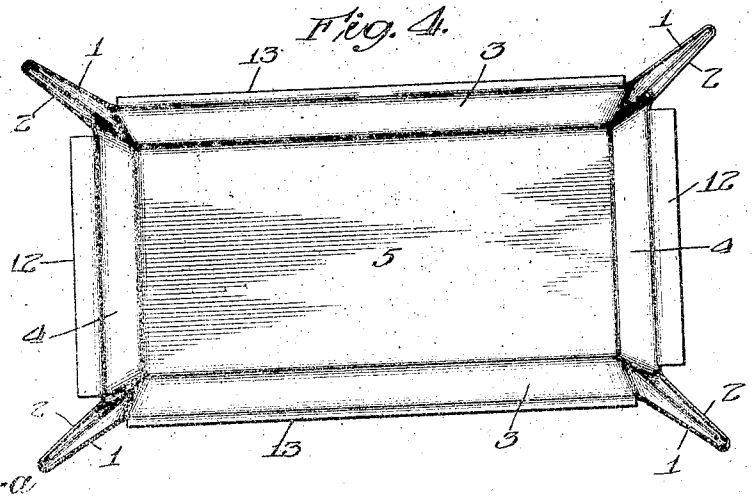


Fig. 5a

Fig. 5.

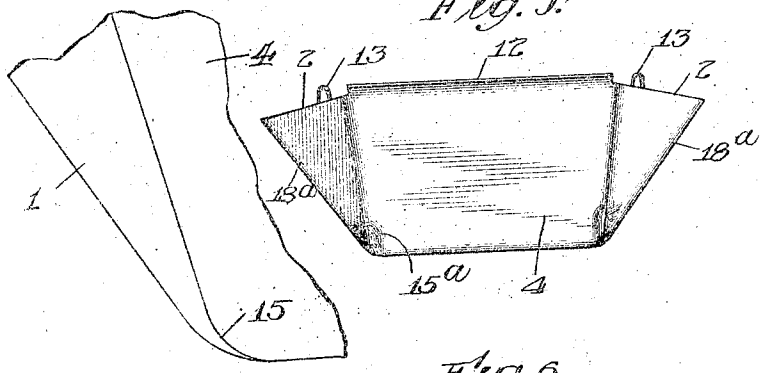
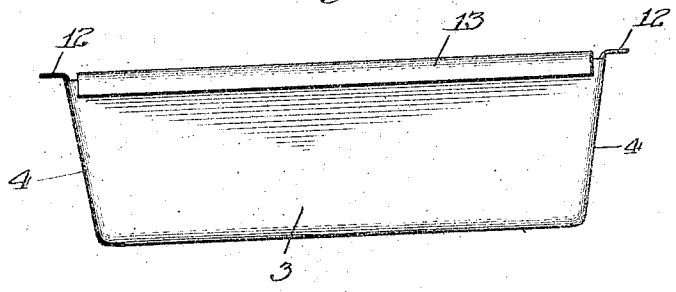


Fig. 6.



Witnesses:
Robert H. Weir
J. H. Weir

Inventor:
Edward Katzinger
by Elliott & Hopkins Attys.

No. 820,976. PATENTED MAY 22, 1906.

E. KATZINGER.

METHOD OF MAKING PANS.

APPLICATION FILED SEPT. 22, 1904.

4 SHEETS—SHEET 3.

Fig. 10.

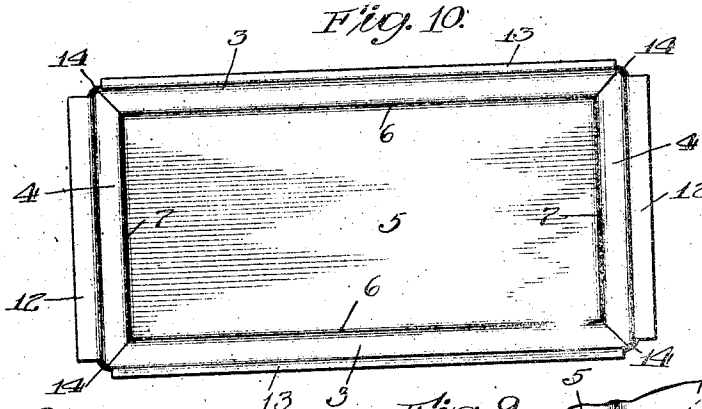


Fig. 8

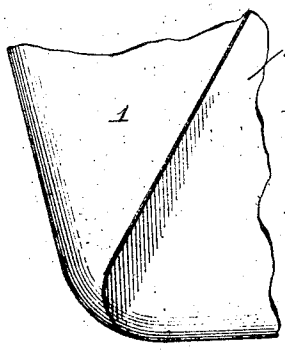


Fig. 7.

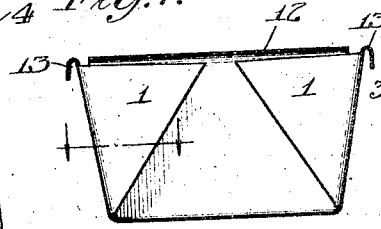


Fig. 9

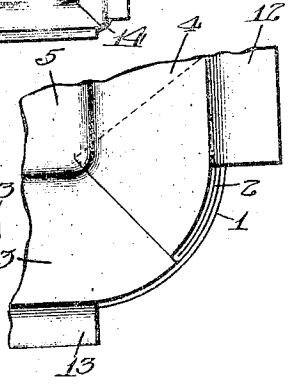


Fig. 11.

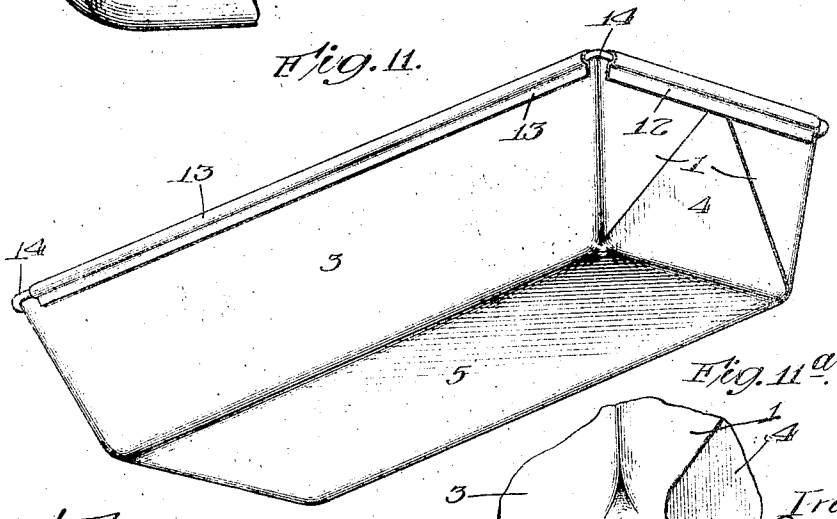
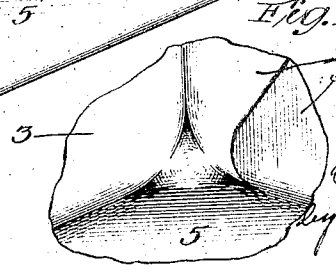


Fig. 11a.



Witnesses
Robert F. Weir
J. B. Weir

Inventor.
Edward Katzinger
by Ellis & Hopkins
Attys

No. 820,976. PATENTED MAY 22, 1906

E. KATZINGER.

METHOD OF MAKING PANS.

APPLICATION FILED SEPT. 22, 1904.

4 SHEETS—SHEET 4.

Fig. 12.

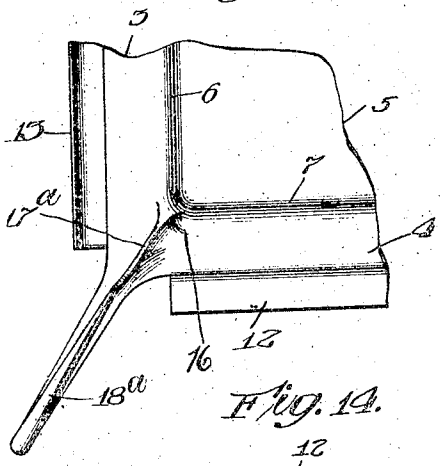


Fig. 13.

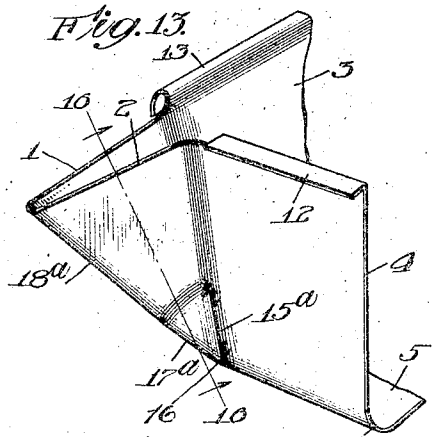


Fig. 14.

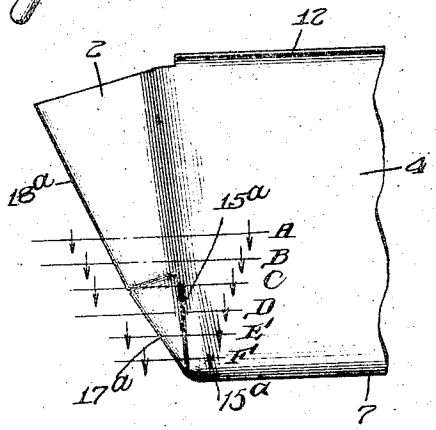


Fig. 15.

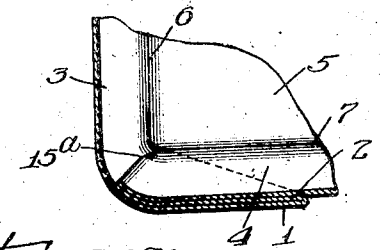


Fig. 17.

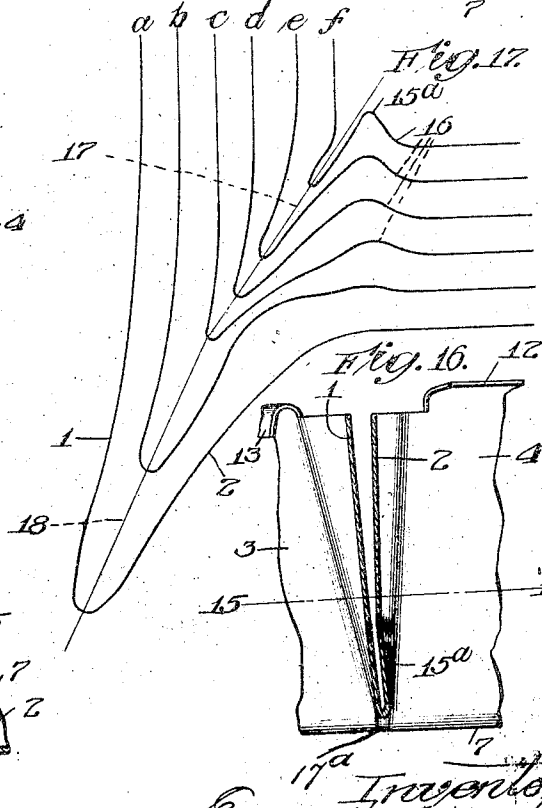


Fig. 16.

Witnesses:
Robert H. Weir
J. B. Weir

Inventor:
Edward Katzinger
by Elliott & Hopkins Attys.

UNITED STATES PATENT OFFICE.

EDWARD KATZINGER, OF CHICAGO, ILLINOIS.

METHOD OF MAKING PANS.

No. 820,976. Specification of Letters Patent. Patented May 22, 1906.

Application filed September 22, 1904. Serial No. 225,431.

To all whom it may concern:

Be it known that I, EDWARD KATZINGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in the Method of Making Pans, of which the following is a full, clear, and exact specification.

My invention relates to pans generally, but more especially to baking-pans, and has for its primary object to form successfully and commercially a concavo-convex corner on a pan produced from thin sheet metal of a low grade incapable of standing any considerable degree of drawing. The object of having such a corner on a pan is too obvious to require explanation; but it might be briefly stated that with a pan of this form not only the liability of damage from the peel in the attempts of the baker to insert it under the pan are reduced to the minimum and the life of the pan thereby prolonged, but the interior is kept free from crevices, indentations, and sharp corners, which hold particles of the loaf, and thus not only make the pan difficult to clean, but disfigures the loaf, and in addition to these advantages is the other important advantage of being more readily nested and not so liable to cling or jam together when nested. To form this desired concavo-convex corner on a pan produced from stout stock and the higher grades of metal that will allow of the requisite amount of drawing might be a comparatively simple task; but when heretofore known methods have been employed for producing the same result from the very thin or lower grades of stock, which should be employed to make an inexpensive article, the same will not draw without rupturing, and hence drawing cannot be relied on, and the corner must be formed primarily by the folding method.

With the described ends in view the invention consists in the features of novelty described herein and shown in the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a pattern or plan of the blank, illustrating the first step of the process or method. Fig. 2 is a side elevation of the blank after it is cupped, illustrating the second step of the method. Fig. 3 is a vertical longitudinal section of the cupped blank. Fig. 4 is a plan view thereof. Fig. 5 is an end elevation thereof. Fig. 5[a] is a diagram of one of the corners thereof. Fig. 6 is a side elevation of the cupped blank after the flaps have been folded inwardly into position against the end walls, illustrating the third step of the method. Fig. 7 is an end elevation thereof. Fig. 8 is an enlarged detail view of one corner thereof in elevation. Fig. 9 is an enlarged detail plan view of one corner, showing the inside. Fig. 10 is a plan view of the pan with the rim-wire in place, illustrating the fourth step of the method. Fig. 11 is a perspective view of the finished pan after the wings or flaps which hold the rim-wire have been squeezed into place, that being the fifth and last step of the method for making a complete pan. Fig. 11[a] is an enlarged perspective of one corner. Fig. 12 is an enlarged detail bottom view of one corner of the cupped blank shown in Fig. 4. Fig. 13 is a perspective view of such corner. Fig. 14 is a side elevation thereof. Fig. 15 is a horizontal section thereof on the line 15 15, Fig. 16. Fig. 16 is an upright section on the line 16 16, Fig. 13; and Fig. 17 is a diagram showing the outlines that would occur on the various section-lines A B C D E F, Fig. 14, and also showing the bend or general direction of the corner-flap, as will be hereinafter explained.

In carrying out my invention I cup a blank to produce the form illustrated in Figs. 2 to 5, the original blank being shown in Fig. 1, and the blank thus cupped, it will be seen, has a two-ply flap of triangular form projecting from each of its corners, the pan to be produced being rectangular; but as all of these flaps are the same in form and construction and are produced by similar means and method the description may be confined to one of them, which will suffice for all. As better shown in Fig. 13, this flap is two ply or comprises two sides 1 2, projecting from and formed on, respectively, the side and end walls 3 4 of the pan, and which side and end walls conjoin with the bottom 5 by gradual rounding bends 6 7, respectively, which are of liberal radius, so as to absolutely avoid the possibility of the peel striking and indenting the wall of the pan near the bottom or of particles of the loaf or other objectionable matter fouling the interior along the line of conjunction between the wall and the bottom. This two-ply flap, it will be seen, has one of the angles of its triangular form situated at the bottom corner of the pan, another at the top corner, and the third at the outer end of the triangle, so that when folded or smoothed

against the end wall 4 of the pan the sides 1 and 2 of the flap will come together and the outer corner of the triangle will lie against the end wall 4 and adjacent to the top of the pan, with the upper edge of the flap substantially parallel with the upper edge of the pan, as shown in Fig. 7. This particular form of the flap and relation of its outer corner to the upper edge of the pan, however, is not material and is only referred to for the purpose of accounting for the peculiar formation of the blank 8 (shown in Fig. 1) from which the pan is produced.

It will be seen that the general form of the blank 8 is rectangular, with the corners cut away or notched to produce at each corner an angular projection 9, the apex of which constitutes the outer corner of the flap 1 2, while the inner upper corner of the flap occurs at the points 10 11. By thus notching the corners of the blank straight strips or lips 12 13 are left on the ends and sides of the blank, respectively, and these eventually form the lips, bearing the same reference-numerals which appear in Fig. 11 for holding the rim-wire 14, as is usual in this art. There is therefore no special importance in the particular shape of blank 8, the features of novelty residing wholly in the shape of the flap 1 2 and the method in which it is folded to produce the concavo-convex corner and which will now be described.

To produce the cupped blank shown in Fig. 4, the blank 8, Fig. 1, is depressed at the center portion, (marked by the dotted lines in Fig. 1,) leaving each corner standing outwardly, as in Figs. 4 and 5, to produce the two-ply flap 1 2 of the peculiar shape and formation shown in the drawings and which is eventually folded inwardly against one wall of the pan, preferably the end wall, as shown in Figs. 6 to 9, this constituting the third step of the method, while the formation of the blank 8 and the cupping thereof to produce the form shown in Fig. 4 constitute, respectively, the first and second steps. After this third step the fourth and fifth steps, consisting, respectively, of placing the rim-wire as in Fig. 10 and pinching the lips 12 13 around the rim-wire, being common in this art, are performed.

It is apparent from Figs. 3, 9, and 15 that not only are the bottom edges of the pan or the places where the walls conjoin with the bottom rounded or curved in cross-section, but that the upright edges also are similarly rounded, and the extreme bottom corners, or that point at each corner of the pan where the bottom, the sides, and the end walls meet, is concavo-convex and on the exterior is preferably a part of a perfect sphere, while the interior is a counterpart thereof. In order to produce this concavo-convex corner, it will be seen that the walls of the pan at the corner or upright edge must be pinched together, not merely along the straight line extending from the bottom to the top corner of the pan, but along the line which curves inwardly on an arc or curvature indicated diagrammatically in Fig. 5ª by the line 15, and which curve or arc is complementary to the curvature of the concavo-convex corner. This creasing of the flap along the curved line 15 causes it to bend sharply along this line when the flap is folded inwardly against the end wall of the pan, whereas if the flap, or, more accurately speaking, the side 2 of the flap, were not so creased the metal would not only wrinkle at the corner, but would bend in a straight line, and consequently produce a sharp corner instead of the desired convex corner. It is apparent, however, that if both sides of the flap were thus creased the outer side when folded against the wall of the pan would contain an objectionable wrinkle. Therefore the inner side only of the flap is given this sharp crease, and in the other figures of the drawings this is shown in the form of an elongated indentation 15ª, which extends from the lower end of the curved line 15, or a point situated at or about the center of the concavo-convex corner to be produced, upwardly a sufficient distance to insure a sharp fold in flap along the curved line 15 at the lower end of the flap, the proper folding of the upper end of the flap being comparatively simple and not requiring this sharp indentation 15ª. It is also apparent from the various sections in Fig. 17, made with reference to Fig. 14, that the end wall of the pan where it conjoins with this indented part 15ª must be rounded inwardly, as shown at 16, to conform to the curvature of the upright corner of the pan, for otherwise when the flap is folded against the end wall it would produce a sharp angle with the side wall. This curvature 16 also, it will be seen by reference to Figs. 14 and 17, disappears at or about the upper end of the kink or crease 15ª, it being sharpest or most pronounced on the section F or below the section F and gradually growing less distinct until the section A is reached, where it disappears entirely the curvature of the upper end of the flap above section B for forming the upper part of the rounded corner being readily produced by the round form of the inner die, which is placed within the pan in the usual manner while the flap is being thus folded, inasmuch as the upper part of the flap is folded on a straight line, as indicated by the upper end of the line 15, Fig. 5ª. It is also apparent from Fig. 17 that the ply or side 2 of the flap is bent at a sharper angle to the end wall of the pan than the ply 1 to the side wall, and the lower edge of the flap or part thereof extending along the line of conjunction between the sides of the flap extends outwardly from a point at or about the center of the concavo-convex corner to be produced in an indirect

line inclining in the direction in which the flap is to be folded against the end wall of the pan, this line being indicated by the two straight lines 17 18, Fig. 17, which meet at or about the point where the upright indentation 15ª disappears. This peculiar angle of the flap is produced, as is also the indentation 15ª and curvature 16, by one and the same operation which cups the blank to produce the form shown in Fig. 4 by any suitable dies, complementary in shape to this form and not necessary to be described in this application, or the same may be produced by hand or by any other means; but the described formation enables me to produce the pan by machinery or dies very economically from a thin or low-grade stock, which could not be otherwise given this desirable concavo-convex corner without cracking or rupturing the metal, and hence I am enabled to manufacture the article on a large or commercial scale, and by reason of my ability to employ a low-grade stock I produce a much cheaper article and one of a vastly superior form or shape.

In the folding operation which presses the flap 1 2 against the end wall 4 pressure is applied in the direction parallel with the end wall first to that portion of the lower end of the flap, which is represented by the line 17 and which line has its counterpart in the article in the form of a thin ridge 17ª, extending along the lower edge of the flap, thus starting the bending of the flap near its lower end or corner before the upper or outer end begins to bend, and consequently the lower end of the flap will be bent around the rounding portion 16 of the end wall and made to conform to the concavo-convex shape of the corner and has its shape thus fixedly established before the pressure (which subsequently comes against the outer end of the flap or that portion represented by the line 18 and which finds its counterpart in the article in the ridge 18ª) has an opportunity to cause the flap to buckle or become distorted at or near the lower end or corner portion, as would be the case should the pressure be applied to the outer end of the flap first, since there would be no means of determining just where the first sharpest bend would occur, and if such bend should occur at any place other than the indentation or crease 15ª along the curved line 15, Fig. 5ª, the flap at the lower end contiguous to the corner of the pan could not be folded smoothly against the corner and in conformity with the curved line 15; but when this is once accomplished the proper folding of the upper outer end of the flap against the end wall of the pan follows as a simple matter and may be readily accomplished by any suitable smoothing die or former which engages the flap on the side 1 and along the ridge 17ª first and as it depresses the ridge 17ª subsequently comes into contact with the ridge 18ª and then presses the whole flap downwardly or inwardly against the wall 4, the shape of the interior of the pan being of course maintained by any suitable die on the inside, as well understood in this art.

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

1. The method of forming a concavo-convex corner on a sheet-metal pan, which consists in cupping a blank to produce a two-ply flap projecting outwardly from the point where the corner is to be produced, in a triangular form, having two of its angles situated at the top and bottom corners of the pan and the other at the outer end of the flap, bending one ply of said flap at a sharper angle than the other where they conjoin respectively with the walls of the pan, then applying pressure first to the lower corner of said triangle and then to its outer and upper corner in a direction transverse to the flap and toward the ply having the sharper of the two angles and longitudinally of one wall of the pan until the sides of the flap are folded together against such wall of the pan.

2. The method of making a concavo-convex corner of a sheet-metal pan, which consists in cupping a blank to form a two-ply flap projecting outwardly from the point where the corner is to be produced, providing one ply of said flap with a sharp indentation along a line curved to conform to the said concavo-convex corner and extending from about the center of such corner upwardly along the line of the upright corner or line of conjunction between the side and end walls, and subsequently folding said flap inwardly against one wall of the pan, over said indentation.

EDWARD KATZINGER.

Witnesses:
FRANCIS A. HOPKINS,
A. M. UHER.