G. W. BERRY.

MANUFACTURE OF LIDS FOR PRESSED SHEET METAL RECEPTACLES.

APPLICATION FILED AUG. 11, 1916.

1,223,849.

Patented Apr. 24, 1917.

2 SHEETS—SHEET 1.

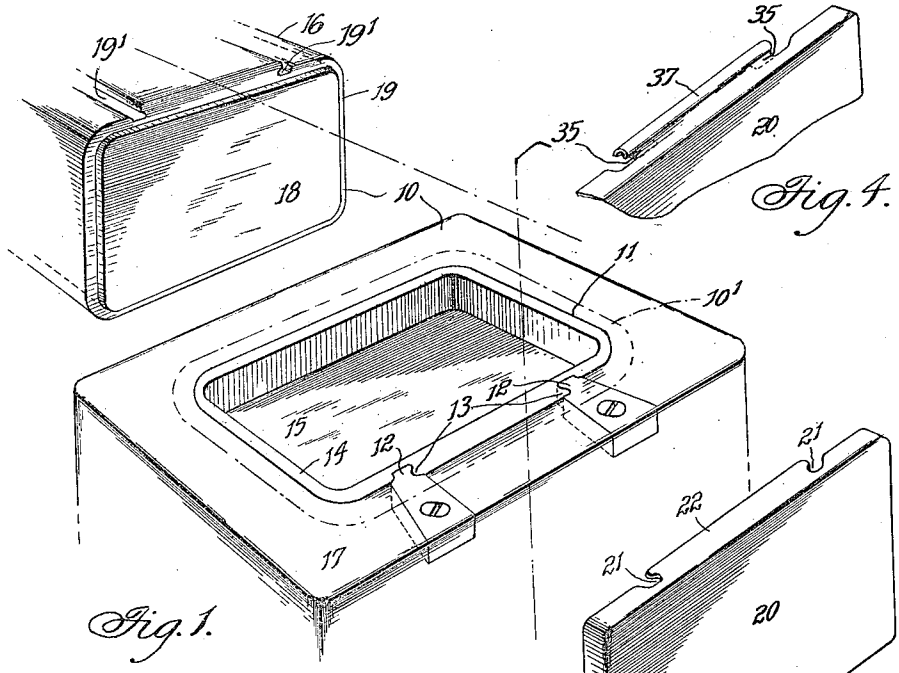


Fig. 1.

Fig. 4.

Fig. 3.

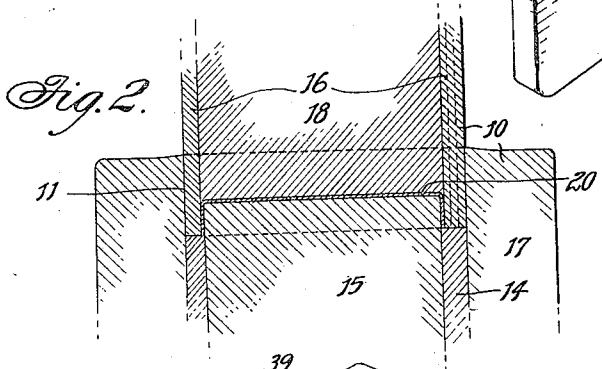


Fig. 2.

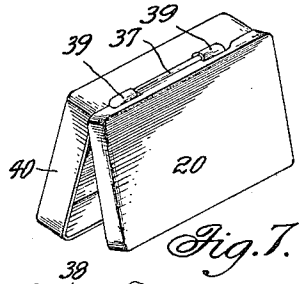


Fig. 7.

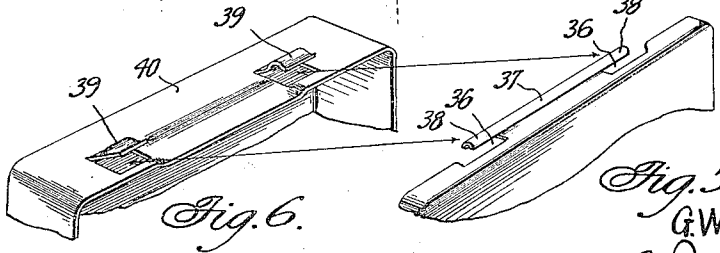


Fig. 6.

Fig. 5.

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2 SHEETS—SHEET 2.

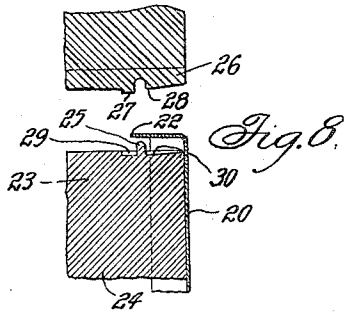


Fig. 8.

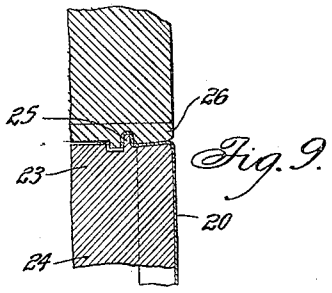


Fig. 9.

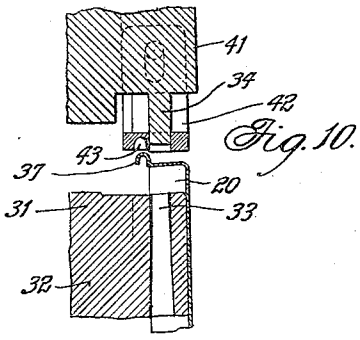


Fig. 10.

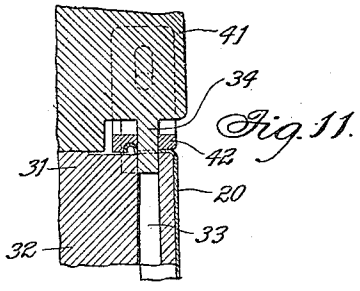


Fig. 11.

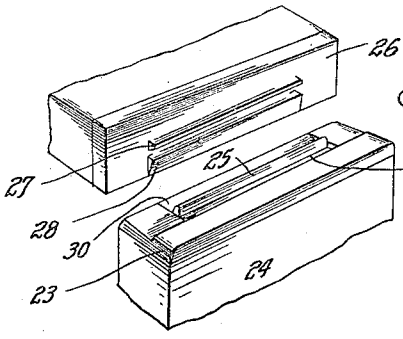


Fig. 12.

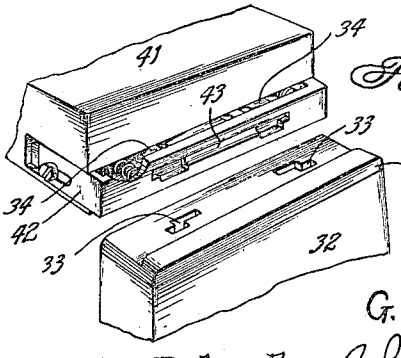


Fig. 13.

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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM BERRY, OF ROSE BAY, NEAR SYDNEY, NEW SOUTH WALES, AUSTRALIA, ASSIGNOR TO THE WIRELESS HINGE MANUFACTURING COMPANY LIMITED, OF SYDNEY, AUSTRALIA.

MANUFACTURE OF LIDS FOR PRESSED SHEET-METAL RECEPTACLES.

1,223,849. Specification of Letters Patent. Patented Apr. 24, 1917.

Original application filed April 22, 1916. Serial No. 93,013. Divided and this application filed August 11, 1916. Serial No. 114,371.

To all whom it may concern:

Be it known that I, GEORGE WILLIAM BERRY, a subject of the King of Great Britain, residing in Rose Bay, near Sydney, in the State of New South Wales, Commonwealth of Australia, have invented new and useful Improvements in the Manufacture of Lids for Pressed Sheet-Metal Receptacles, of which the following is a specification.

This invention relates to the manufacture of lids for pressed sheet metal receptacles comprising a body portion formed with bulbed tongues that are designed to form pivotal bearings for pintles formed integrally on the lids, and the present application is a division of my co-pending application filed April 22, 1916, bearing the Serial No. 93,013. The invention is applicable to the lids of rectangular receptacles, or receptacles other than rectangular having one flat side.

The object of the invention is to provide commercially effective means whereby integral pintles may be produced with certainty by bending and cutting a lid rim stock in a certain succession of die press operations, and to obviate the losses and avoid the failures hitherto encountered as a consequence of the bending die jumping and gripping the stock and mutilating it. It is necessary that the hinge pintles be uniform in dimensions and identical in form and shaped to fit rotatably free in the bulbs on the body which form pintle bearings.

In carrying out the present invention a depending piece of stock is left on one of the lid rims in the lid forming operation, to provide material for the hinge pintles.

In the first die operation to form hinge pintles on the lid, the depending margin of the rim stock is die rolled to a tubulous or fluted section, and in a succeeding operation two or more slots, depending upon the number of hinge pintles required, are made in the rim stock above the die rolled marginal portion thereof so as to form from the adjacent portions of the die rolled margin two or more pintle members as the case may be, each adapted to be inclosed within bulbs formed on tongues in the body stock.

The ends of the depending portion of the rim lid stock are rounded in the lid forming operation, so that when the marginal portion is die bent burring or ragging will be obviated and the unattached ends of such marginal portion will be rounded, thereby insuring a free fit for the pintles in the bulbs of the tongues.

The accompanying explanatory drawings illustrate lid hinge members in successive stages of their production, and they illustrate also the construction of the punches and die blocks with their essential accessory parts in which the forming, bending and slotting operations are severally effected.

Figure 1 is a perspective view of the forming punch and die block used for producing a lid from flat stock.

Fig. 2 is a vertical section explanatory of the die press operation in which the lid blank is produced by means of the punch and die shown in Fig. 1.

Fig. 3 is a view of a lid formed by the first die press operation and is delivered for the making of integral pintles thereon.

Fig. 4 is a view of the back part of the lid after the second die press operation.

Fig. 5 is a view of the back part of a lid after the third and final die press operation.

Fig. 6 is a view of the back portion of a body made to receive the ends of the tubulous "false wire" formed on the lid.

Fig. 7 is a view of a lid and body fitted together.

Figs. 8 and 9 are transverse sections through the first set of dies used in carrying out the invention as shown the depending part of the lid stock is die rolled to form a tubulous or fluted edge or "false wire" (see Fig. 4). Fig. 8 shows the second operation punch before its descent, and Fig. 9 shows said punch in the closed position on the die block with the formed metal contained between the punch and the die block.

Figs. 10 and 11 are corresponding views showing the punch and die block in the next step of the manufacture. In this step the lid stock is slotted back rearward of the ends of the tubulous "false wire" to form same into pintles as shown in Fig. 5.

Fig. 12 is a view in perspective of the punch and die block shown in Figs. 8 and 9.

Fig. 13 is a view in perspective of the punch and die block shown in Figs. 10 and 11.

Two sets of dies and punches are installed in a multi-die press for performing the second and final operations for shaping the lids. The said press is fitted with means of transferring the work in progress from the feed to the first die block, thence at the completion of the first movement of the press to the second block, and thence ejecting the completed lids. The means for conveying the lids into and out of the machine and for transferring them from one die block to another therein does not form a part of the present invention.

The numeral 10 designates a punch and die block for cutting and forming the lids from flat stock that is indicated by dotted lines 10^1. The die block (see Figs. 1 and 2) is formed of a stout block of metal having a deep groove 11 formed vertically therein and corresponding with the lid shape; on one side of said groove two inwardly projecting notch cutters 12 are fitted. The inner side of each of said cutters 12 is slightly recessed at 13 and the width of the mortise groove is greater between these cutters than at its other parts. A drawing ring 14 is fitted slidably in the groove 11, and has a neat sliding fit over a forming block 15; the shape of this block 15 is counterpart to the shape of the lid blank to be made.

The ring punch 16 is so shaped on its outer periphery that it will run neatly into and completely fill the groove 11 in the die block.

The outer ring of the die block is splayed up for shearing at the edge of the groove 11. When forming lids a sheet of stock 10^1 is placed over the die block and the punch dropped thereon. The edges of the cut stock are forced downwardly around the forming block 15 by the continued downward movement of the punch ring 19 and follower 18, and the edges of the cut stock are pressed neatly downward around the top of said block, the rims on the lid being thus formed.

The sides of the inserted notch cutters 12 and counterpart undercut grooves 19^1 in the punch ring 16 are tapered to insure draw of the notched part of the rim around the forming block.

The follower 18 recedes into the punch ring as same enters the die block; when the punch is raised it carries with it the formed lid, the same is ejected from the punch by the follower 18 when it is pushed downwardly when the punch ring is nearing the limit of its upward travel. 20 is a lid produced as already described. The back rim of this lid is made deeper between the notches 21 than its depth elsewhere; the centrally disposed depending portion 22 provides stock for the formation of hinge pintles.

The notches 21 extend more or less (see Fig. 3) into the rim stock above the depending part 22 and curve the ends of said depending part as shown.

In order to give a tubulous or fluted shape to the depending portion 22 the lid blank is set over the die block 23 mounted on a bed 24.

The lid die block 23 is formed with a longitudinally disposed rib 25 of the same length as or slightly longer than the depending portion 22 of the lid rim. The top punch 26 is formed with two parallelly disposed drawing ribs 27 and 28 with intervening groove which is counterpart to the rib 25. The rib 27 is slightly deeper than the rib 28 and as the punch descends the said rib 27 bends the edge part of the depending portion 22 of the lid rim over the inner edge of the rib 25 before the rib 28 bears on the upper part of the depending portion of the lid. The bending and pinching of the edge of the stock margin insures accurate drawing and bending to form the tubulous or fluted edge as shown in Fig. 4 of the drawings. The ribs 27 and 28 set into shallow countersinks 29 and 30 in the die block. Hinge pintles are formed in a later operation by slotting out stock rearward of the tubular or fluted edge.

The die block 31 for slotting out the lid stock to form pintles is mounted on a bed 32 that is mortised as shown at 33 counterpart to punches 34. The said punches 34 slot out portions 35 of the lid stock as shown by the dotted lines in Fig. 4 of the drawings, thereby to carry back the notches 21 as shown at 36 Fig. 5 thus forming the ends of the bent margin 37 into hinge pintles 38 which are adapted to be engaged by and pivot in the bulbs 39 on the back of the receptacle body 40 (see Figs. 6 and 7).

The ram 41 is fitted with a spring controlled stripper saddle 42 shaped to accommodate the punches 34. A recess 43 formed in the stripper 42 accommodates the central portion of the bent margin 37 on the back of the lid.

The bulbs 39 when closed, are sufficiently large to permit free pivotal movement of the pintles 38 when the lid is being opened and closed. The object in rounding off the points of the depending stock 22 from which the "false wire" 37 is formed is to remove and prevent subsequent formation of bur or rag and so insure for said pintles free movement in the said bulbs.

What I do claim is:—

An apparatus for forming a rimmed lid with a depending portion on one rim and from the margin of which hinge pintles are formed comprising a forming punch and a

die-block, a deep groove formed vertically in said die-block, notch cutters projecting inwardly from one side of said groove, recesses in the inner sides of said cutters, a drawing ring having its outer periphery shaped to fit snugly in said groove and around said cutters, a forming block located within said drawing ring and below the level of said cutters, said punch having its periphery shaped to fit neatly in said groove, and an ejector block fitting slidably within the lower part of said punch.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE WILLIAM BERRY.

Witnesses:

M. STARFIELD,

H. C. CAMPBELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."