K. CHRISTIAN.

DEVICE FOR DRAWING AND PRESSING LIDS OR COVERS HAVING BEADED RIMS.

APPLICATION FILED JAN. 25, 1907.

936,603. Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1

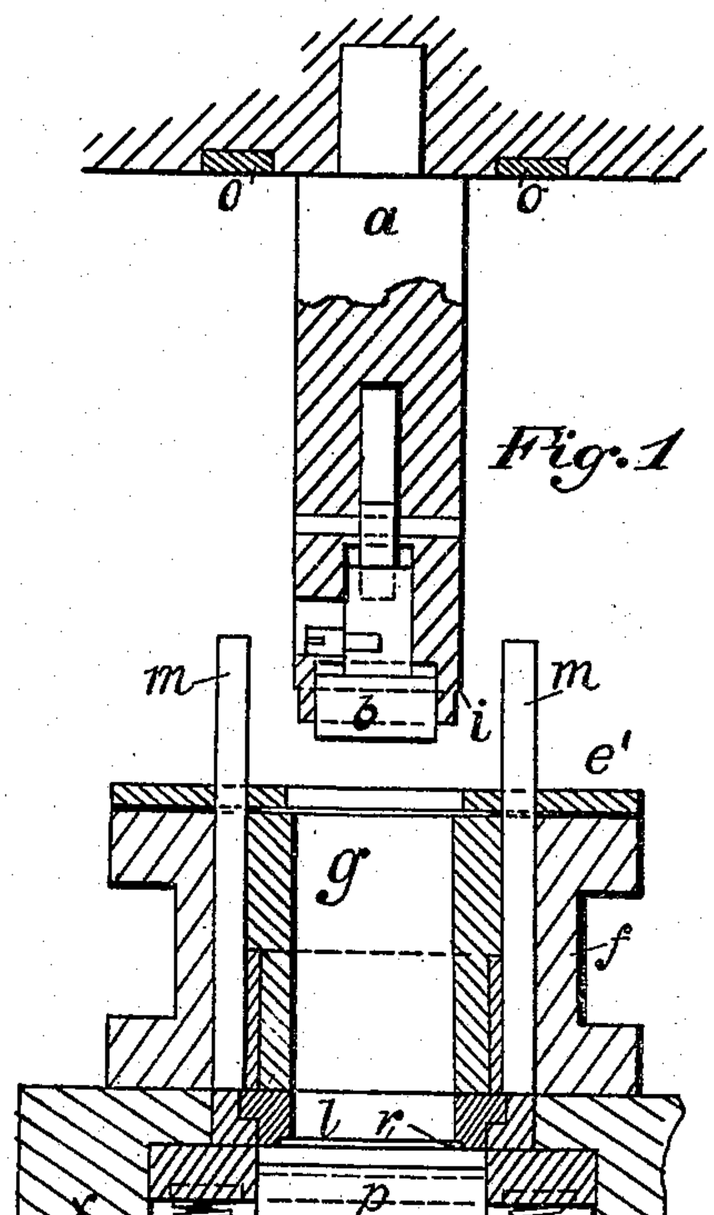

Fig. 2

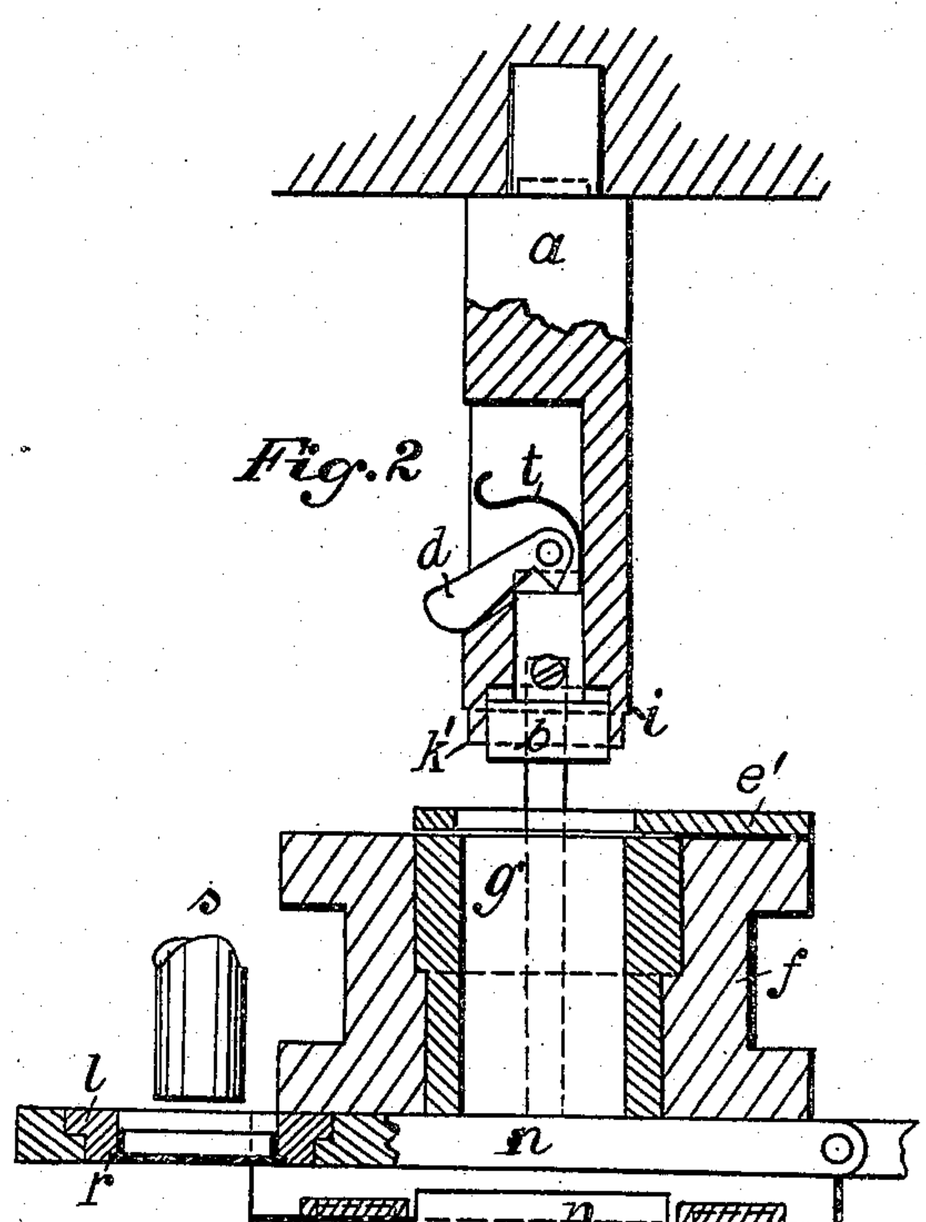

Fig. 3

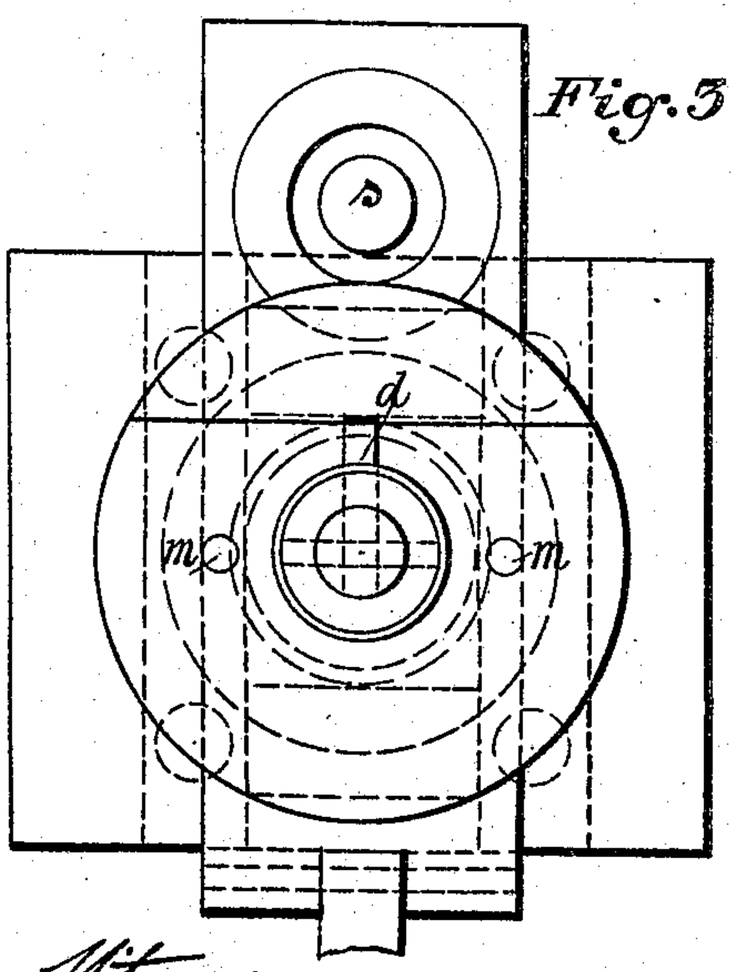

Fig. 4

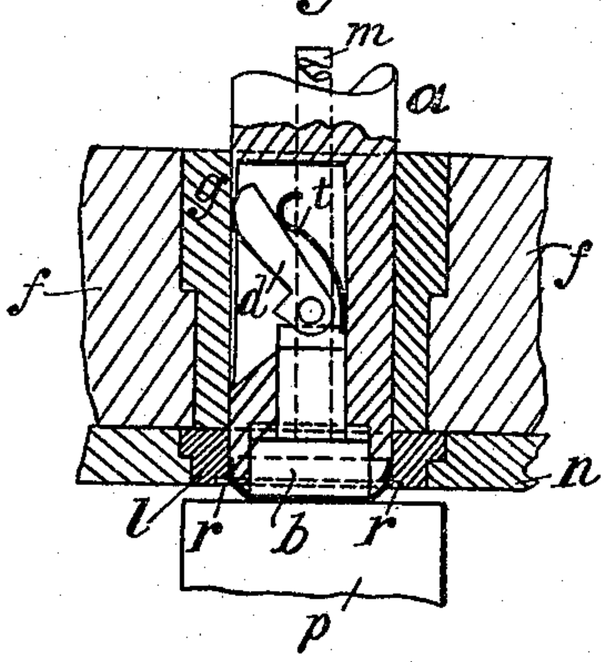

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Fig. 5

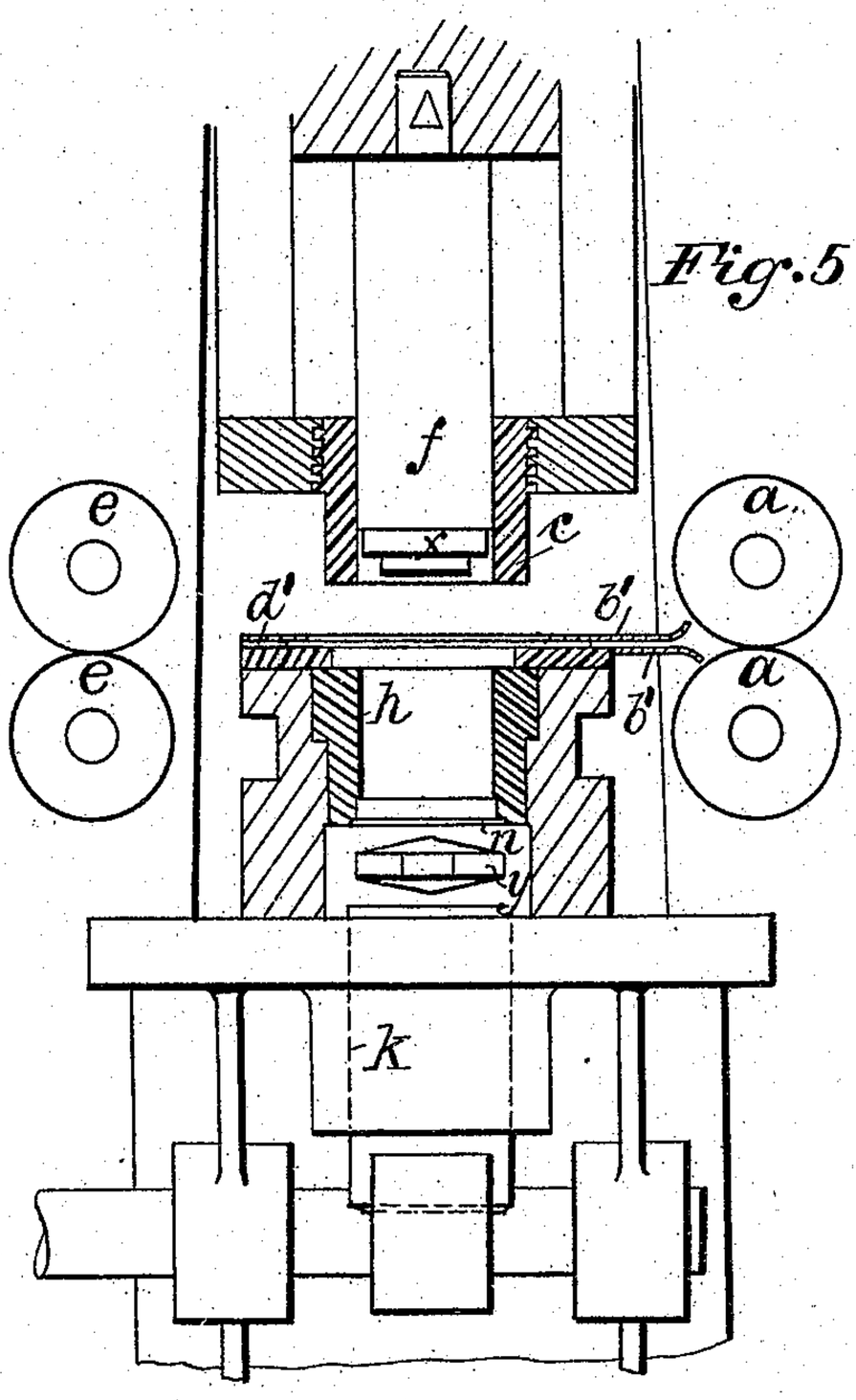


Fig. 6

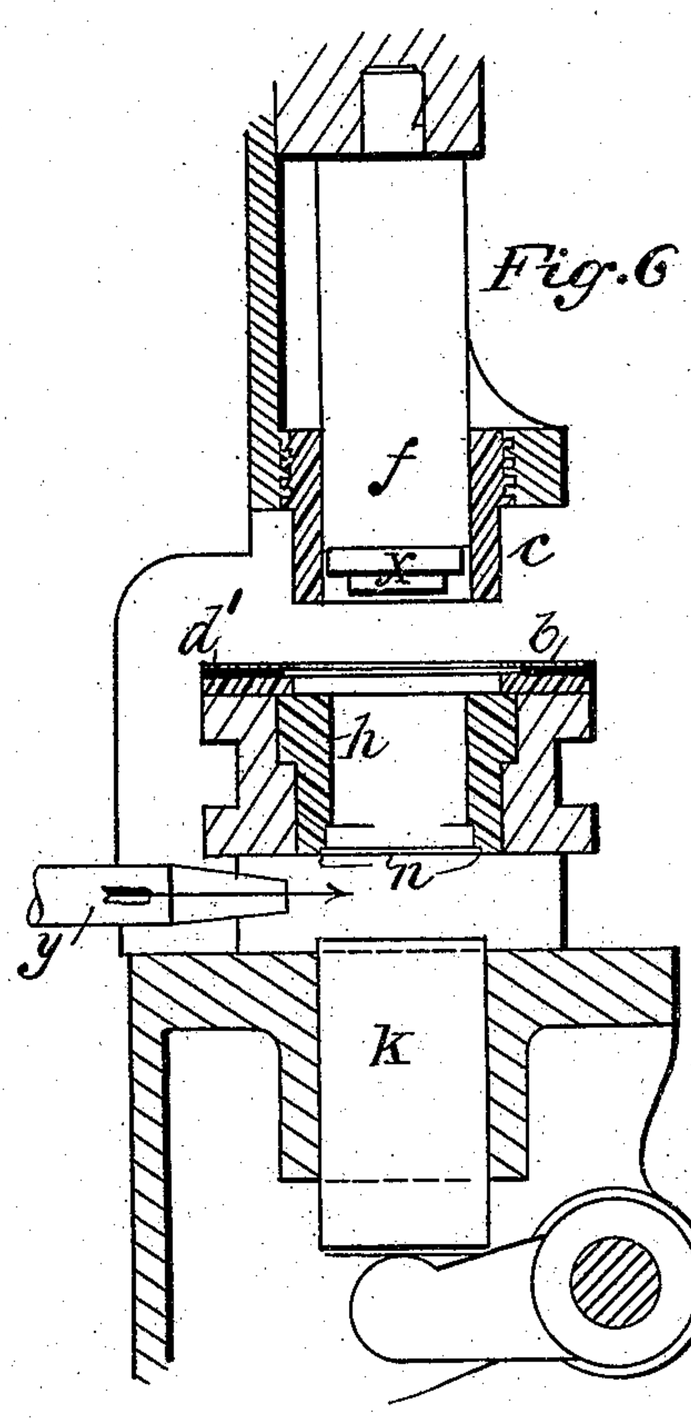


Fig. 7

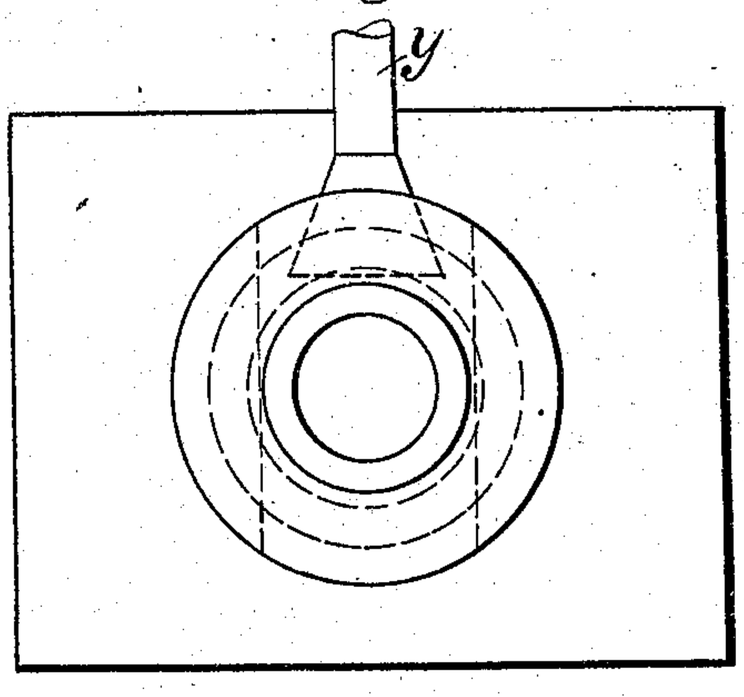
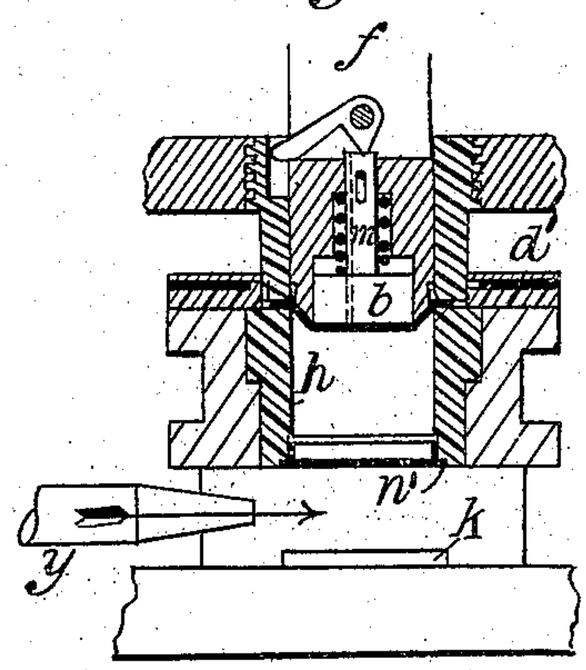


Fig. 8



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UNITED STATES PATENT OFFICE.

KUNO CHRISTIAN, OF WÄCHTERSBACH, GERMANY.

DEVICE FOR DRAWING AND PRESSING LIDS OR COVERS HAVING BEADED RIMS.

936,603. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed January 25, 1907. Serial No. 354,114.

To all whom it may concern:

Be it known that I, KUNO CHRISTIAN, a subject of the German Emperor, and a resident of Wächtersbach, Germany, have invented certain new and useful Improvements in Devices for Drawing and Pressing Lids or Covers Having Beaded Rims, of which the following is a specification.

This invention relates to a device for drawing and pressing lids, or covers, of paste board, sheet metal, gelatin and the like, having a beaded rim and for manufacturing these articles by combining in one operation the two steps of drawing and beading the rim, the rim being formed at the same time as the lid, or cover. This device is represented in the accompanying drawing in which—

Figure 1 is a sectional view of the device in its initial position. Fig. 2 is a sectional view of the device with the cover about to be expelled. Fig. 3 is a plan of the device. Fig. 4 is a sectional view of the device in the position in which the beading of the rim is beginning. Fig. 5 is a sectional view illustrating a modification of the invention. Fig. 6 is a sectional side view. Fig. 7 is a plan of the parts shown in Figs. 5 and 6, the stamps being removed. Fig. 8 is a sectional detail view of a means for removing the article formed by the mechanism.

The device in accordance with this invention comprises a main stamp *a*, a drawing matrix die *g*, and a lower structure or bed *x*. The main stamp *a* has arranged in it a second, or inner, stamp *b* which is projected by gravity, or by spring power or mechanically and can be secured in its projected position by an eccentric *d*, so that, at the beginning of the operation, it projects beyond the main stamp *a*. The inner stamp *b* is thereby caused to first meet the material laid between a holder *e'* and a support *f* surrounding the matrix die *g*, as shown in Fig. 4, and to force the material into the matrix die. The material is drawn into a conical form at the part between the main stamp *a* and the inner, or drawing, stamp *b*, and from a portion of this, when the bottom of the lid, or cover, is being pressed flat, the projecting rim of the lid, or cover, is formed. After the cutting edge *i* of the main plunger *a* has passed beyond the upper edge of the matrix die *d*, the projecting handle of the aforesaid eccentric *d* meets the aforesaid holder *e'* and is turned upward so as to bear against the wall of the matrix die as shown in Fig. 4 of the drawing so that the inner stamp becomes free and can go back into the main stamp *a*.

When the main stamp has entered a ring *l* in a slide *n* below the matrix die to such a distance that its lower edge *k'* coincides with the edge of the ring *r* which forms the beaded rim, two pins *m* fixed to the slide *n* meet two small plates *o* on the attachment of the main plunger and move the slide *n* and forming ring *l* and plunger *a* against a bottom plate *p*. The inner stamp *b*, which has in the meantime been liberated, as aforesaid, is, on meeting this plate *p*, pushed upward and a portion of the aforesaid conical part of the material is forced back into the recess *r* of the aforesaid ring *l*, thereby forming the edge, or bead, of the lid. On the return stroke of the main stamp *a*, the finished lid is held back in the slide by the said edge, or bead, and is moved with the slide laterally from beneath the matrix and is ejected from said slide by a plunger *s*, the slide returning to its original working position. In order that the inner stamp *b* may be again locked in its projecting position, a spring *t* is provided which tends constantly to return the eccentric *d* to its locking position.

The tool just described may be simplified by omitting several of the movable parts, thereby insuring a greater certainty of action. This modification is shown in the Figs. 5 to 8 of the drawing. In this modification the material is cut into strips by transporting rolls *a* fed between guides *b'* and brought into position on the plate *d'* under the cutting punch *c*. Rolls *e* effect the removal of the cut-off scrap. The cutting punch *c* advances before the stamp *f*, cuts the material to the required shape, and remains at a standstill slightly above the matrix *h*, as shown in Fig. 8. The stamp *f* then descends and draws the material into the matrix in the manner hereinbefore described, and stops with its lower edge *x* in coincidence with the recess *n'* at the lower part of the matrix *h*. A lower stamp *k* now moves upwardly toward the main stamp *f*, and as the inner stamp *b* has been released and is permitted to retract, the material drawn into the matrix by said stamp *b* is forced by the stamp *k* into the recess *n'* at the lower end of the matrix and forms the desired bead or rim. The lower stamp *k* remains in this position until the drawing

stamp *f* has been withdrawn from the lid, or cover. The withdrawal of the drawing stamp is rendered possible by the fact that the lower stamp *k* presses on the bead formed in the recess *n'*, and thus holds the lid, or cover, in position. This is also facilitated by the fact that the matrix *h* is enlarged at the height of the piece of work as at *o'*, so that the lid, or cover, fits only loosely on the drawing plunger *f*. An air passage is provided which prevents the formation of a vacuum. After the drawing stamp has been withdrawn from the lid or cover, the lower stamp *k* releases the same, and during the succeeding operation air pressure is created in the matrix *h* by the descending stamp *f*, which causes the ejection of the completed lid or cover from the matrix, and the lid or cover is then expelled from the machine by a stream of compressed air supplied by a pipe *y*.

I claim:—

1. In a machine of the class described, the combination with a matrix, of a stamp movable into and from the matrix and comprising two relatively movable members, means movable with the stamp into the matrix and acting to hold the inner member thereof in advance of the outer member during the initial portion of the stamping operation, means for releasing said holding means while both members of the stamp are within the matrix, and means for returning the holding means to operative position as the stamp is withdrawn from the matrix.

2 In a machine of the class described, the combination with a matrix, of a stamp movable into and from the matrix and comprising two relatively movable members, pivotally mounted means for holding the inner member of the stamp in advance of the outer member, during the initial portion of the stamping operation, means for releasing said holding means while both members of the stamp are within the matrix, and means for returning said holding means to operative position.

3. In a machine of the class described, the combination with a matrix, of a stamp movable into and from the matrix and comprising two relatively movable members, a spring acting to hold the inner member of the stamp in advance of the outer member, supplemental locking means for holding said members of the stamp in the aforesaid relative position during the initial portion of the stamping operation, and means for automatically releasing said holding means while the stamp is within the matrix.

4. In a machine of the class described, the combination with a matrix, of a stamp movable into and from the matrix and comprising two relatively movable members, means mounted within a chamber within the stem of the stamp for holding the inner members thereof in advance of the outer member during the initial portion of the stamping operation, means for releasing said holding means while the stamp is within the matrix, and means for subsequently expanding a portion of the drawn material to form a bead thereon.

5. In a machine of the class described, the combination with a matrix, of a stamp movable into and from the matrix and comprising two relatively movable members, means movable with the stamp into the matrix and acting to hold the inner member thereof in advance of the outer member during the initial movement of the stamp into the matrix, and means for automatically disengaging said holding means

6. In a machine of the class described, the combination with a matrix, and a cutting punch, of a stamp mounted to reciprocate through the punch and to draw into the matrix material cut from a blank by said punch, said stamp comprising two relatively movable members, means movable into the matrix with the stamp for holding the inner member thereof in advance of the outer member during the initial movement into the matrix, and means for releasing said holding means.

7. In a machine of the class described, the combination with a matrix, and a cutting punch, said matrix and punch being relatively movable toward and from each other, of a stamp arranged to reciprocate through the punch and to draw into the matrix material cut from a blank by the punch, said stamp comprising two relatively movable members, means supported by one of said members and engaging the other for holding the inner member of the stamp in advance of the outer member during the initial movement thereof into the matrix, said means being carried into the matrix with the punch, means for releasing said holding means while the stamp is within the matrix, and means for expanding a portion of the drawn material to form a bead thereon.

8. In a machine of the class described, the combination with a matrix, and a stamp comprising two relatively movable members, said matrix and stamp being relatively movable to bring the stamp within the matrix, of means carried by the stamp, and adapted to be surrounded by the matrix when the stamp is therein, for holding the inner member of the stamp projected from the face of the outer member, and means for releasing said holding means as it is carried into the matrix with the stamp.

9. In a machine of the class described, the combination with a matrix, and a stamp comprising two relatively movable members, said matrix and stamp being relatively movable to bring the stamp within the matrix, of means for holding the inner member of

the stamp projected from the face of the outer member, and means at the upper end of the matrix for automatically releasing said holding means during the relative movement of the stamp and matrix.

10. In a machine of the class described, the combination with a matrix, of a stamp comprising two relatively movable members, both movable into and from the matrix, a catch normally holding the inner member of the stamp projected from the face of the outer member, and means on the matrix for releasing the catch.

11. In a machine of the class described, the combination with a matrix, of a stamp comprising two relatively movable members, an eccentric having an arm adapted to engage the inner member of said stamp to hold said member projected from the face of the outer member, and having another arm adapted to engage said matrix to release the engagement of said eccentric with said inner member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

KUNO CHRISTIAN.

Witnesses:

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JOHN BAKER.