(No Model.) 3 Sheets—Sheet 1.

A. F. REMY.

DIE FOR MAKING CAN HEADS.

No. 563,688. Patented July 7, 1896.

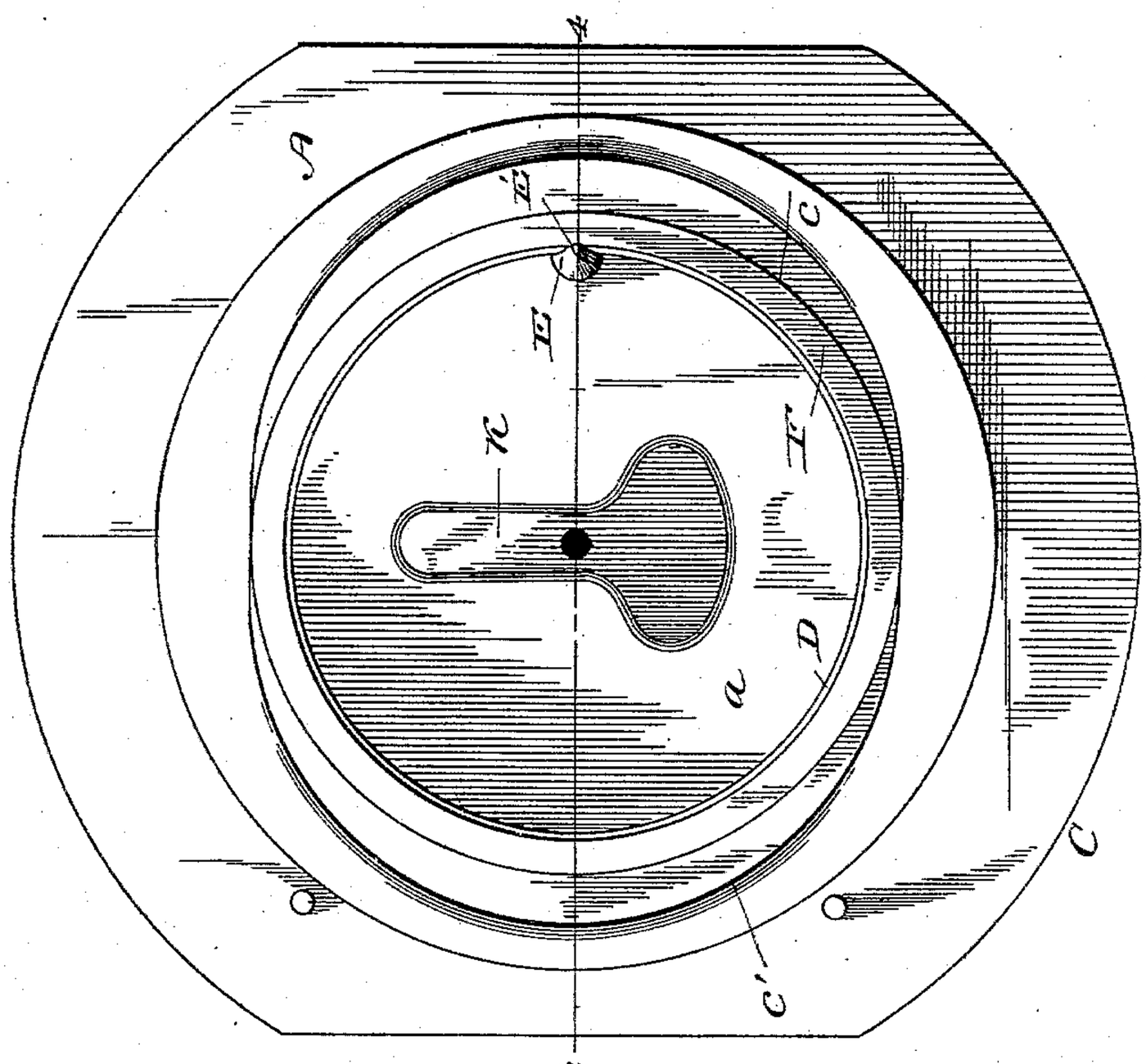

Fig. 2.

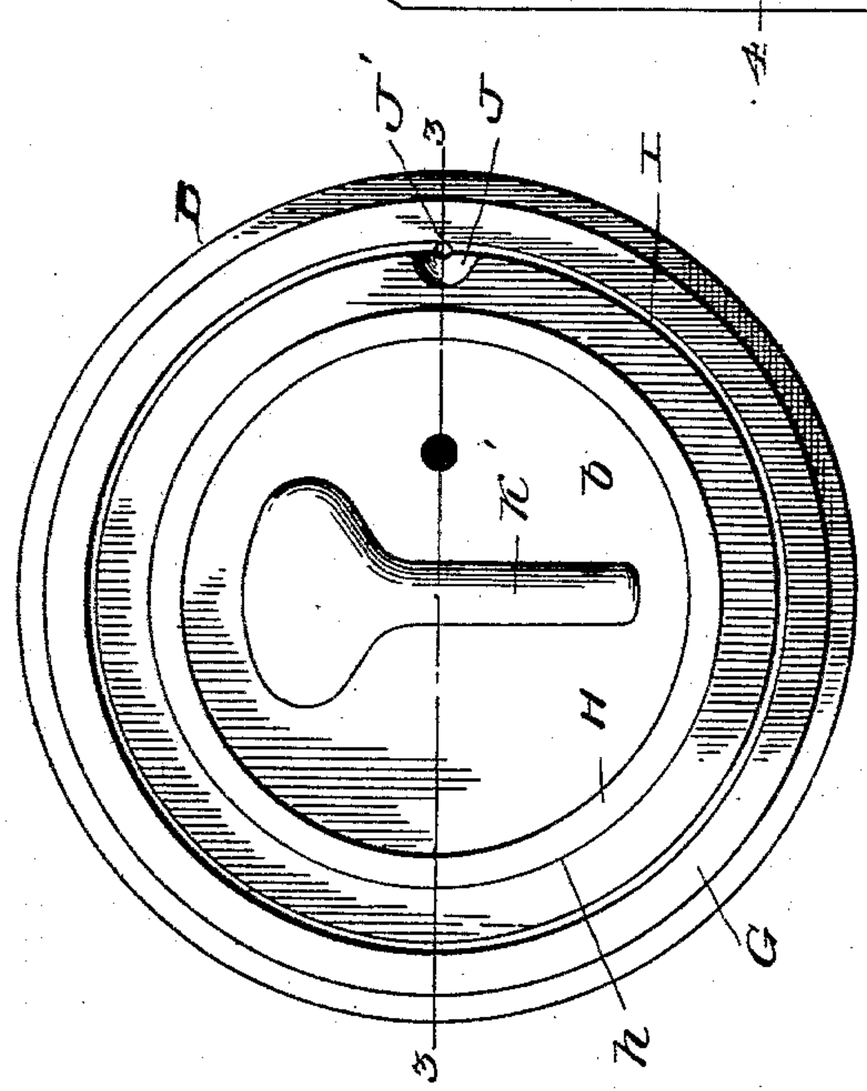

Fig. 1.

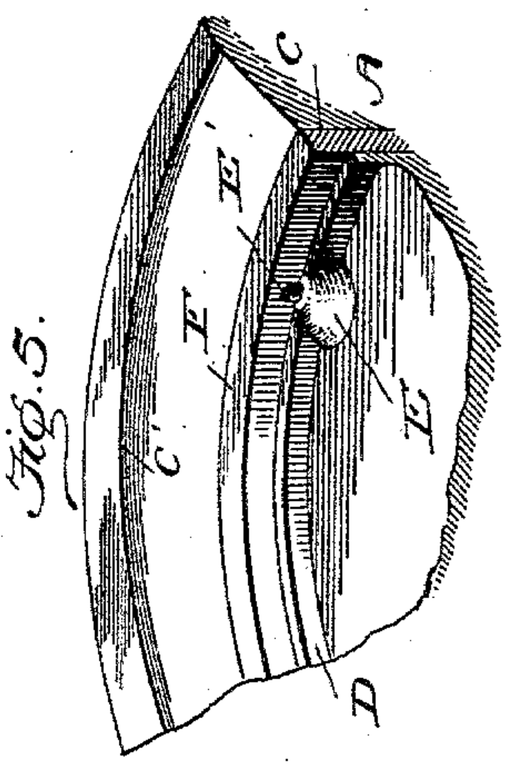

Fig. 3.

Witnesses:
Wm. O. Cashiell,
F. W. Mothershead.

Albert F. Remy.
Inventor.
By Edson Bros.
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

A. F. REMY.

DIE FOR MAKING CAN HEADS.

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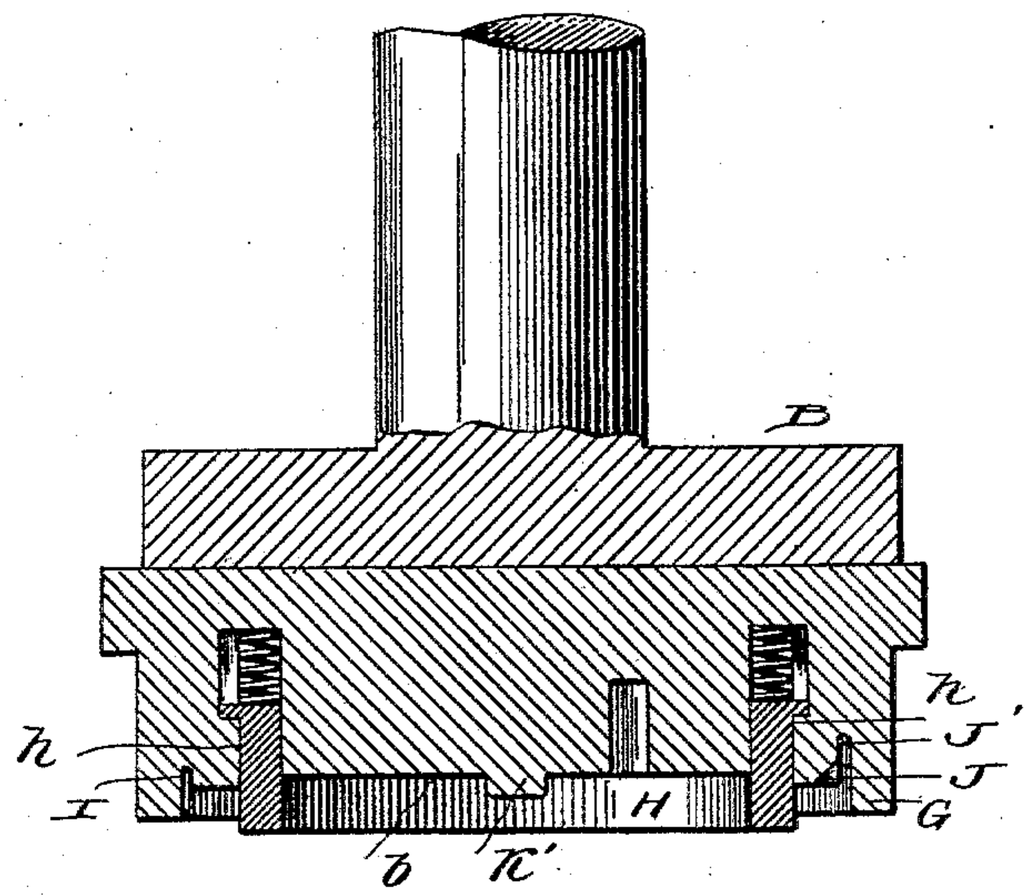
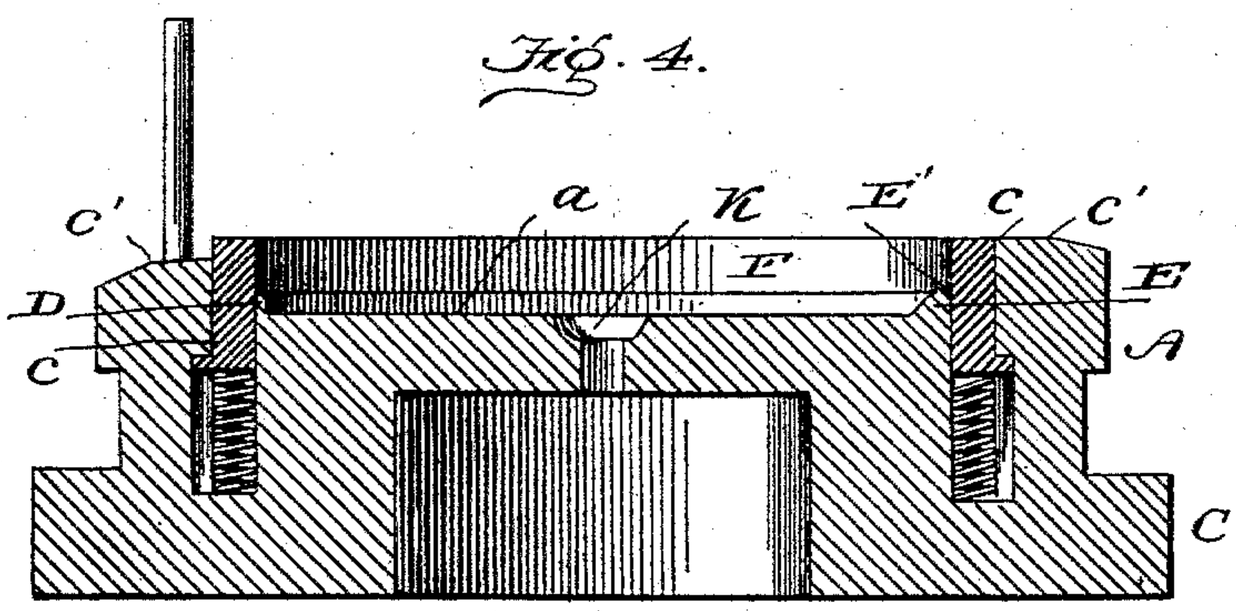


Fig. 3.

Fig. 4.



Witnesses:
Wm. O. Dashiell
J. E. Northcraft

Albert F. Remy
Inventor.
By Edson Bros.
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

A. F. REMY.

DIE FOR MAKING CAN HEADS.

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Fig. 7.

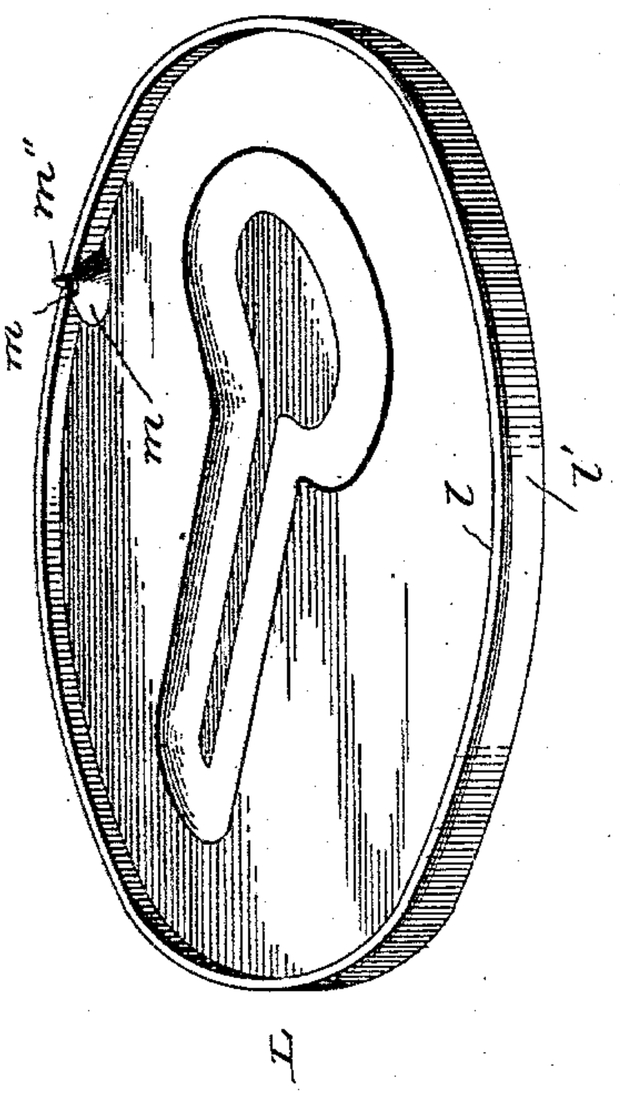


Fig. 8.

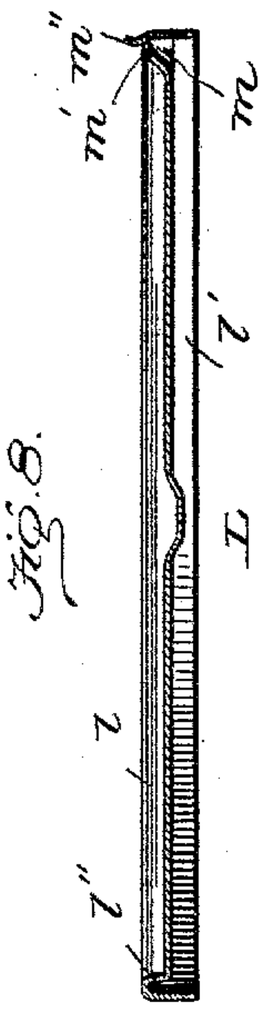
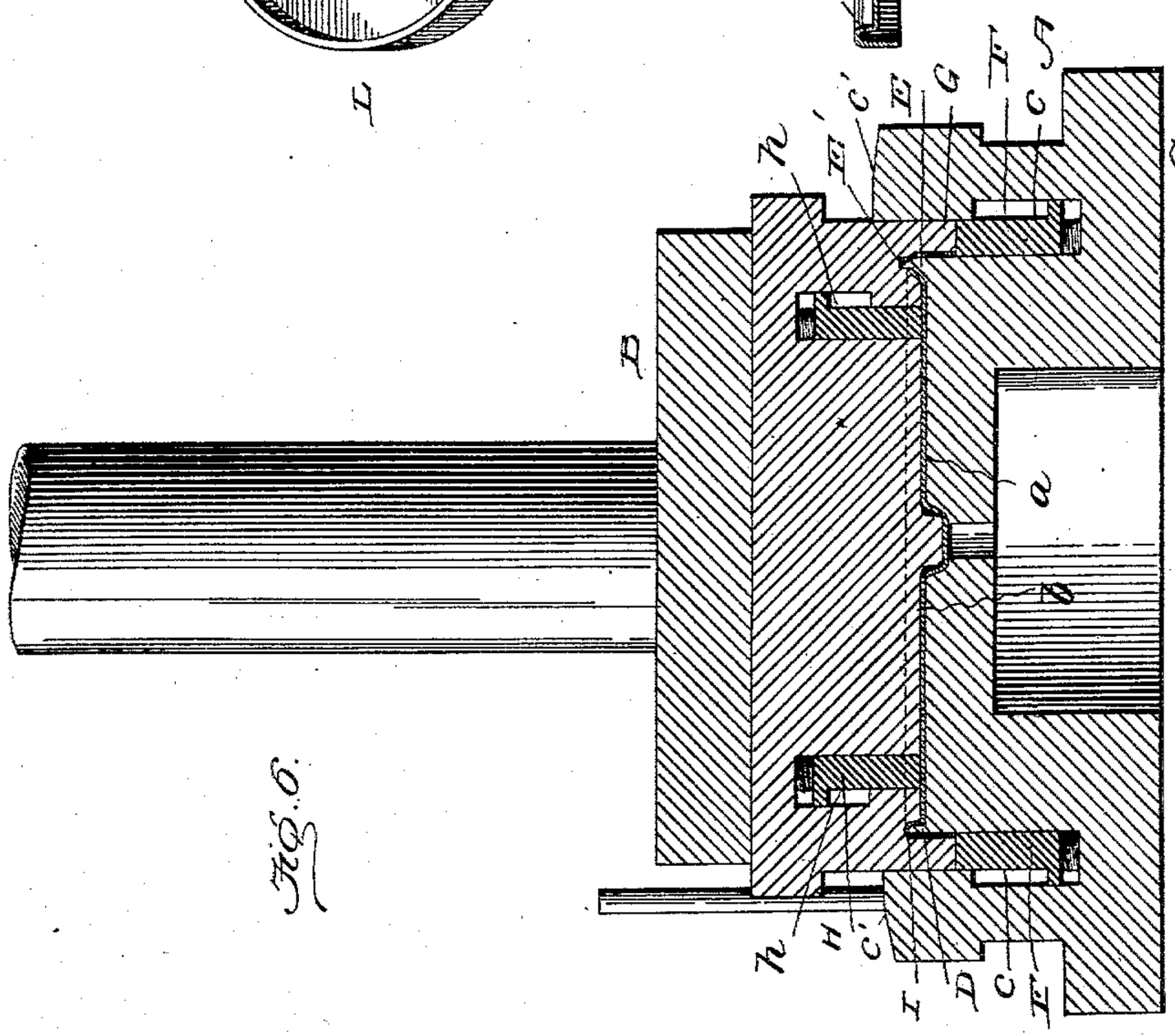


Fig. 6.



Witnesses:
Wm. O. Cashell
J. D. Mothershead

Albert F. Remy
Inventor.
By Edson Bros.
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT F. REMY, OF MANSFIELD, OHIO.

DIE FOR MAKING CAN-HEADS.

SPECIFICATION forming part of Letters Patent No. 563,688, dated July 7, 1896.

Application filed April 3, 1896. Serial No. 586,145. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. REMY, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Dies for Making Can-Heads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to dies for making the heads of cans or packages used for packing food substances or other articles, and the improvement relates more especially to dies constructed in a manner to produce a head for receiving a ripping or cutting wire, which head is to be united to a can-body to produce a "self-opening" or "key-opening" can or package.

The object of my invention is to provide a simple construction which at one operation produces from a simple flat piece of sheet metal a head which is formed with a flanged, beaded, and grooved edge and with a bulged or raised portion within the bead and flange, said raised or bulged portion having an inwardly-opening aperture, which may be or is partially closed by a lip or fragment of metal integral with the can-head.

To the accomplishment of these ends, my improvement consists, first, in a pair of dies, one of which dies is provided with a yieldable or movable ring and with a rigid rib or flange within said movable ring, and the other die having a groove or recess coincident with the rigid rib or flange in the first-named die, whereby the movable ring in the female die is adapted to be depressed under the pressure from the male die to such an extent as to allow the rigid rib or flange to force the metal into the groove of the male die and thereby shape the metal to form a can-head which has, at its circumference, a flange and a hollow bead forming an annular groove between the flange and the flat portion of said head.

My invention further consists in a female die provided with a punch which rises from the face thereof and is situated, practically, within the annular rib or flange, said punch having at its upper end a projecting tooth or spur, combined with a male die formed with a cavity and with a recess so arranged as to receive the raised portion and punched metal produced in the sheet-metal blank by the operation of the punch and its tooth of the male die; and the invention further consists in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, forming a part of this specification, and in which—

Figures 1 and 2 are plan or face views of the male and female dies, respectively, embodying my invention. Fig. 3 is a vertical transverse sectional view through the male die on the plane indicated by the dotted line 3 3 of Fig. 1. Fig. 4 is a vertical sectional view through the female die on the plane indicated by the dotted line 4 4 of Fig. 2. Fig. 5 is a detail perspective view, on an enlarged scale, of a part of the female die to better illustrate the form of the punch and its prong or tooth. Fig. 6 is a vertical sectional view through the two dies, illustrating them adjusted together for shaping and forming a sheet-metal blank into a can-head, such as hereinbefore described, and Figs. 7 and 8 are views of the can-head to be produced by dies embodying my invention.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A B designate the two coacting dies, the former, A, being the female die and the latter, B, the male die.

The female die proper, A, is seated or fastened rigidly within a suitable base C, that is designed or adapted to be secured within a suitable metal stamping and shaping machine. This die A has around its circular edge the annular rib or flange D, which extends above the flat horizontal die-face *a* for a distance equal to the depth of the groove to be produced, along with a bead in the sheet-metal blank by the operation of the two coacting dies A B. This annular groove-and-bead-forming rib or flange D is integral with said female die, as shown, or it may be made separate from the die and rigidly at-

tached thereto. Said female die A is further provided with the punch E, which is situated within the annular rib or flange D. The shape of this punch E is somewhat segmental in horizontal section and tapers from the base to the top thereof, said punch being approximately in the form of a half-cone with its flat side next to the rib or flange D, the tapered punch extending from the inner wall of said rib D inwardly toward the axis of the die A. Said punch E extends upward from the flat face *a* of the die A for a distance about equal to the depth of the rib D, and from the upper extremity, or what may be termed the "apex," of this punch E projects the tooth or spur E'. Said spur E' is rigid or integral with the punch and rib or flange of the female die, and it projects a short distance above the punch and rib of said die, as shown more clearly by Fig. 5 of the drawings. I prefer to make the tooth E' incline inwardly away from the rib or flange and to make said spur of tapered form.

The base C is of greater diameter than the female die A, and the latter is seated centrally within said base in a manner to leave an annular space between the circular edge of the die A and the inner face of the circular wall *c* of the base. In this annular space between the base and die is fitted a movable ring F, which surrounds the die and normally projects a suitable distance above the die-face *a*, the rib D, and punch E E' of said die A. The circular wall *c* of the base has its upper face, around the inner edge thereof, shaped to lie at different heights or elevations, so as to produce a cutting edge *c'* around the inner edge of said wall *c*, and this edge *c'* projects above the movable ring F at certain points, while at other points said cutting edge lies below the ring F when the latter is in its normal position preparatory to the introduction of the sheet of metal between the two dies A B, such form of the cutting edge *c'* causing it to easily sever the metal in disk form from the sheet of metal.

The male die B carries an external ring G of a diameter and width to exactly register with the movable ring F of the female die. Within this rigid external ring G, and in the face *b* of the male die, is produced an annular groove *h*, which is concentric with the vertical axis of said die B and with its external rigid ring G; and in said groove *h* is seated a yielding clamping-ring H. Said clamping-ring is backed or held by a suitable spring or springs, as is common in sheet-metal-shaping dies, and said clamping-ring H and the backing-springs thereof are so arranged that, normally, the lower edge of the clamping-ring extends below the corresponding (or lower) edge of the fixed external ring G of said male die, said-clamping-ring H being adapted to move into the groove *h* a distance equal to its projection beyond the die-face *b*, so that the outer or lower edge of the ring H will lie flush with the face *b* when the dies are brought together. This male die is further provided with a bead-forming groove I, which is produced in the face *b* within the rigid external ring G, concentric therewith, and also concentric with the vertical axis of the die B. This groove is so formed in the die A as to register with the rib or flange D when the two dies are properly adjusted, and said groove receives the metal raised in the blank by the operation of the rib or flange D, whereby the groove I and rib D in the two dies serve to produce in the sheet-blank the flange, bead, and groove of the can-head.

The die B is further provided with a cavity J, which is cut or produced in the face *b* of the die, so as to open into the groove I, and this cavity conforms in shape substantially to the contour of the punch E. In the die B is produced the recess J', which is formed in the die immediately above the groove I and in a plane at one side of the cavity J. The cavity J and the recess J' are produced in the die B in such positions that, when the dies are brought together, the metal struck up by the punch E is forced into the cavity J, while the lip or fragment of metal and the spur E' are forced into the recess J'.

In the face *a* of the female die is produced a recess K and in the face *b* of the male die is a matrix K', which are arranged to register when the dies are brought together and produce a recess in the can-head suitable to receive a key which is supplied with the can or package for the purpose of coiling the ripping-wire on said key in the operation of cutting the head from the body of the package or can.

In Figs. 7 and 8 I have shown the head produced by the operation of my dies. The head L has a bead *l*, which projects from the outer face thereof, and it also has a flange *l'*, the groove *l''* being formed by and between the bead and flange. Within the bead *l* is the raised or bulged portion *m*, and in said bulged portion is an aperture *m'*, which opens inwardly of the can head, said aperture being adapted to be partially closed by a tongue or fragment *m''* of metal integral with the head L.

The operation of the dies may be described as follows: The base C with the female die A is suitably secured in an ordinary sheet-metal stamping and shaping press, and the male die B is fastened to a reciprocating plunger of said press, said dies being adjusted to insure registration of the ring F with ring G, the rib or flange D with groove I, the punch E and prong E' with cavity J and recess J', and the matrix K' with the flange K. A sheet of flat metal, suitable for making a can-head, is fed between the dies A B, and the die B is forced down on top of the ring F, thus clamping the metal between the rings F G. As the die B descends the ring F is depressed, which causes the cutting edge *c'* to sever the metal, and the disk confined between the rings F G is carried down with said rings, so as to be presented to the rib

D. The ring F descends below the face *a* of the die A and the metal is forced up by the rib D into the groove I, (see Fig. 6,) thus producing the groove *l''* in one face of the can-head and forming the bead *l* and flange *l'* on the opposite face and edge of the can-head. At the same operation the punch E and its prong E' produce in the head the bulged portion *m*, the aperture *m'*, and the tongue *m''*, the metal raised by said punch and spur entering the cavity and recess J J', respectively. During this operation the spring-backed ring H bears on the solid face *a* of the die and it yields upwardly, so that the projection K' of die B will force the metal into the matrix K, thus producing the cavity in the middle of the can-head. The dies now separate, and the head L is ejected from the female die by a suitable ejector and by the upward movement of the ring F. The head emerges from the lower or female die in a complete condition, ready to receive the ripping-wire, and said head I is thus made or completed at one operation of the coacting dies.

I am aware that changes in the form and proportion of parts and the details of construction herein shown and described as the preferred embodiment of my invention can be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications as fairly fall within the scope of my invention.

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

1. Coacting dies for making can-heads, the female die provided with a fixed punch and with a puncturing tooth or spur, and the male die having a coincident cavity and recess, for the purposes described, substantially as set forth.

2. In dies for stamping or shaping can-heads, a female die provided with a bead and flange forming rib, a fixed punch within said rib, and a spur or tooth extending above the rib and punch, combined with a male die having a groove coincident with the rib, a cavity and a recess to register, respectively, with said punch and the tooth or spur, substantially as and for the purposes described.

3. In dies for stamping and shaping can-heads, the female die provided with a fixed punch within a rib D and with a projecting tooth or spur, combined with a movable ring which surrounds said female die, and a male die having a rigid external ring, an annular groove in its face coincident with the rib, a cavity and the recess which register, respectively, with the punch and the tooth or spur of the female die, substantially as and for the purposes described.

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

ALBERT F. REMY.

Witnesses:
L. S. KOPPES,
EDWIN HODKINSON.