

C. A. LINDHOLM.
PUNCH AND DIE MECHANISM.
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948,818.

Patented Feb. 8, 1910.

Fig. 1.

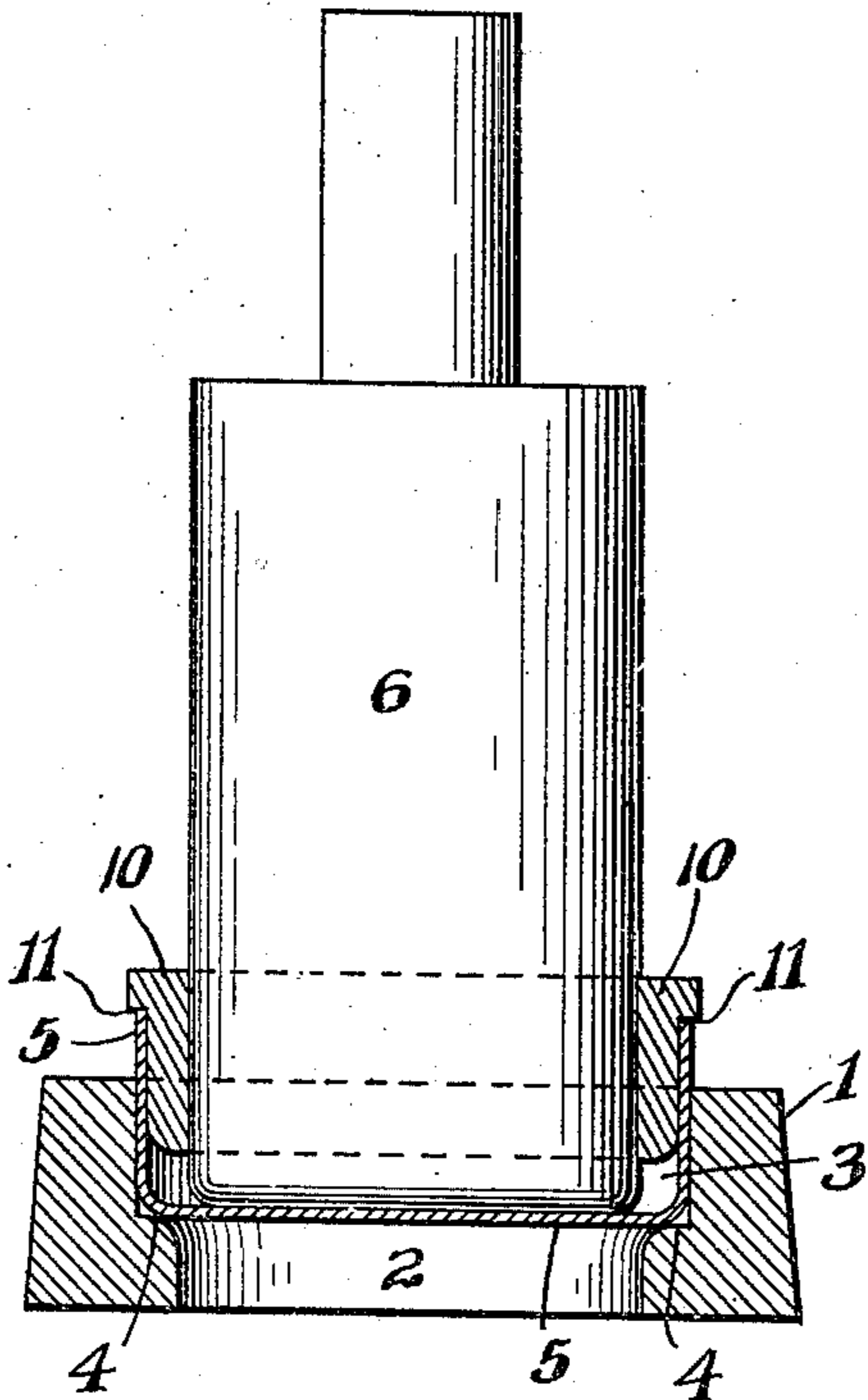


Fig. 2.

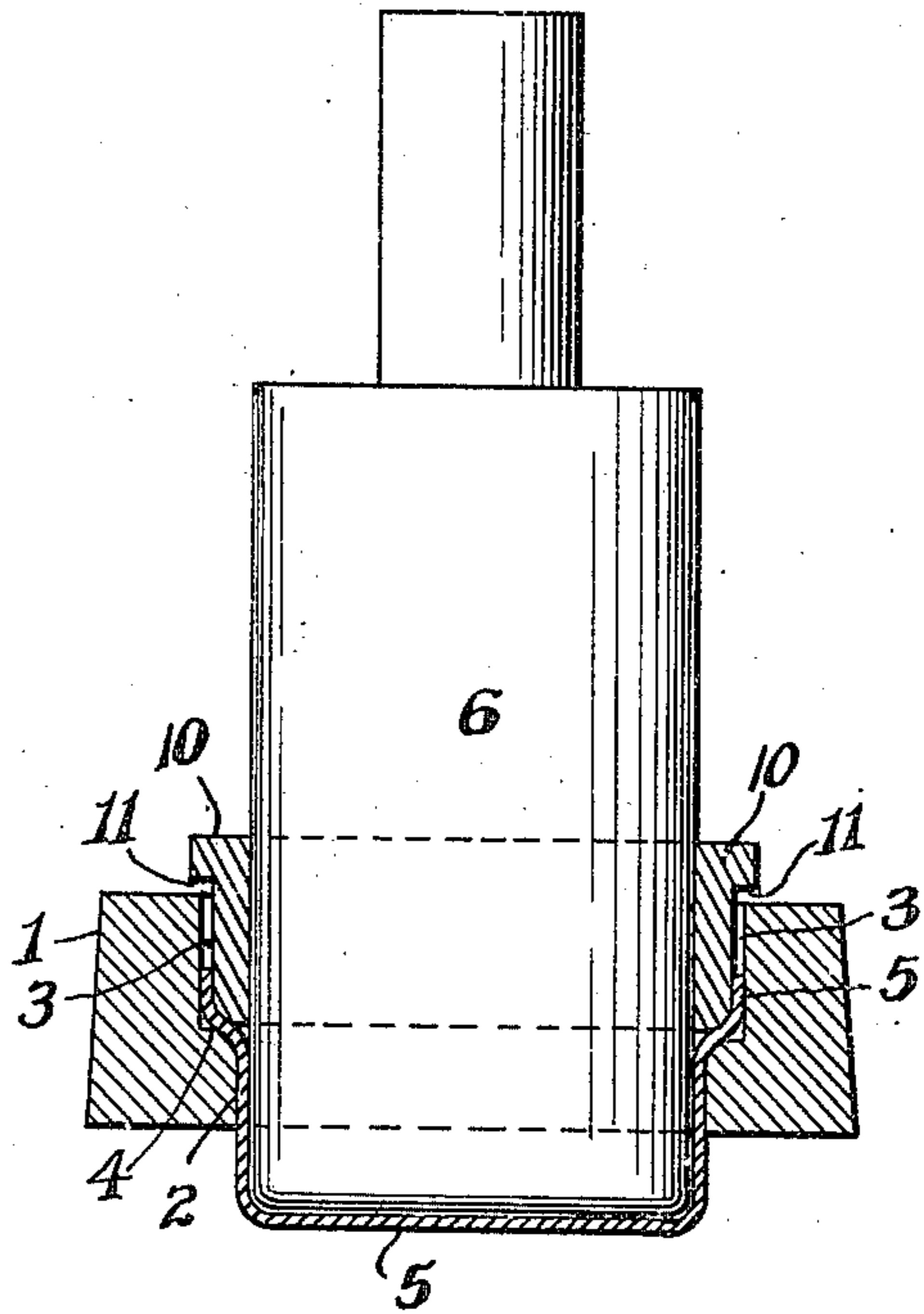
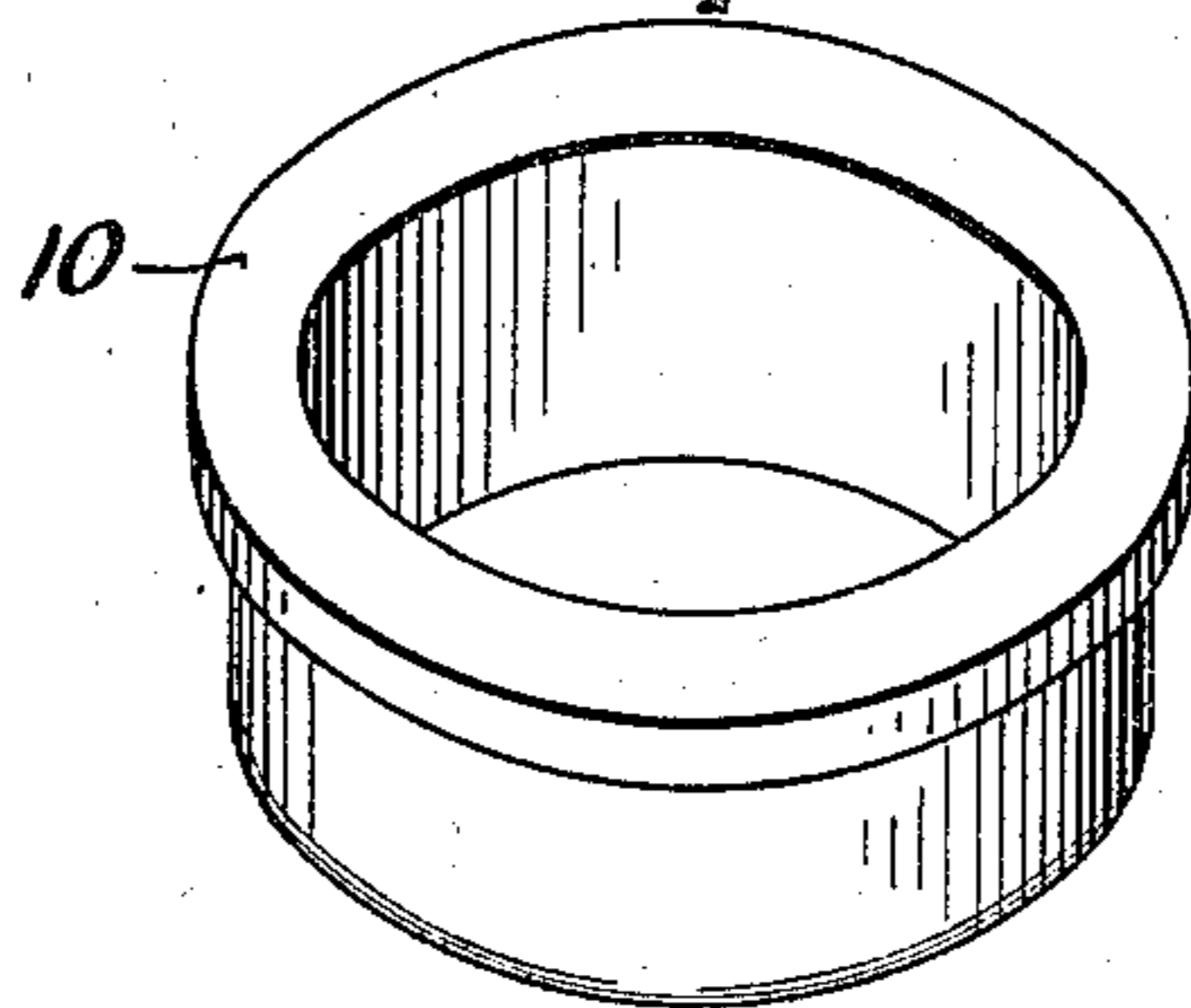


Fig. 3.



WITNESSES

Carrie E. Klinefelter.
Daniel Webster.

Charles Lindholm INVENTOR
BY Cyrus N. Anderson ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES A. LINDHOLM, OF RIVERSIDE, NEW JERSEY, ASSIGNOR TO LINDHOLM METAL STAMPING COMPANY, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PUNCH AND DIE MECHANISM.

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To all whom it may concern:

Be it known that I, CHARLES A. LINDHOLM, a citizen of the United States, residing at Riverside, Burlington county, State of New Jersey, have invented certain new and useful Improvements in Punch and Die Mechanism, of which the following is a specification.

My invention relates to an improvement in punch and die mechanism.

It has been found that in the use of punches and dies as heretofore constructed, the walls of the articles, such as cup-shaped devices, pressed therein, are not of uniform thickness and the edges thereof are not of even height but are rough and uneven.

The object of my invention is to provide a punch and die mechanism having means to insure that the walls of articles pressed therein shall be of uniform thickness and also to insure that the edges of such articles shall be smooth and even.

Another object of my invention is to provide means which will occasion a slight thickening of the metal in the formation of such cup-shaped article instead of slightly decreasing its thickness as has heretofore been the case so far as I am aware.

A convenient embodiment of my invention is illustrated in the accompanying drawings, but it is to be understood that I am not limited to the details of construction which I have shown but may modify the same within the scope of my claims.

In the drawings:—Figure 1 is a sectional view of a punch and die mechanism provided with my invention; Fig. 2 is a view similar to Fig. 1, the parts thereof being in different relative positions with respect to each other; and Fig. 3 is a perspective view of an attachment to be used in connection with a punch and die.

Referring to the drawings:—1 designates a die having an opening 2 therethrough which is enlarged as indicated at 3, leaving a shoulder 4 to support a cup-shaped member 5 in position to be operated upon by the punch 6. The cup-shaped member 5 shown in Fig. 1 may be formed upon any suitable die or in any other known manner which may be found desirable. The outside diameter of the cup-shaped member 5 is substantially equal to the diameter of the enlarged portion 3 through the die 1. The punch 6 is adapted to press the cup-shaped

member 5 through the smaller portion 2 of the opening through the die, the diameter of the punch 6 being sufficiently small to permit it to pass through the opening 2 while surrounded by the side walls of the cup-shaped member 5. In being pressed through the smaller portion of the opening 2 in the die 1, the diameter of the cup 5 is decreased and its walls lengthened, as is clearly indicated in Fig. 2 of the drawings.

Surrounding the punch 6 is a sleeve-like member 10 called by me a follower. The follower 10 is located between the punch and the inner surface of the cup-shaped member 5 and also projects into the enlarged opening 3 in the die 1. The follower 10 is of less length than the depth of the cup 5 and is provided with a shoulder 11 at its upper or outer edge which rests upon the top of the member 5 and prevents the lower end of the said follower 10 from approaching too near to the shoulder 4 of the die 1. It is found that if the lower edge of the follower 10 is located against the bottom of the cup-shaped member 5 and in line with the end of the punch 6, it is apt, at the beginning of the operation, to follow the punch and the cup inwardly of the die 1 and to become wedged between the die and the edge of the shoulder 4, possibly preventing the operation entirely or, if not, occasioning a drag or pull upon the member of the cup to stretch it out too thin at the point or points affected. This is undesirable and for this reason the shoulder 11 is provided to support the follower 10 in the position shown at the beginning of the pressing operation.

In Fig. 2 the follower 10 is shown in a lower position than is shown in Fig. 1 with respect to the said die. In said Fig. 2 the follower 10 has followed the cup-shaped member 5 downwardly until its lower edge is supported by the sides of the cup above the shoulders 4. After the operation has once begun, there is no danger that the lower edge of the cup will wedge between the punch 6 and the edge of the shoulder 4 of the die.

In the use of a punch and die mechanism provided with the follower 10, I am enabled to lengthen the walls and to decrease the diameter of a cup-shaped member, at the same time keeping the walls and the bottom of the cup of uniform thickness and also retain the edges of the cup smooth and

even. This is greatly to be desired. Furthermore, I am enabled by my invention to occasion a slight thickening of the walls which is very important when the cup is to be used for the manufacture of grease cups for use in the lubrication of machinery of various kinds.

Having thus described my invention, I claim:—

1. In combination, a die having a shoulder formed therein to support a cup-shaped article placed in the said die, a punch adapted to enter the said die, a follower surrounding the said punch and having an outwardly extending projection at one edge and the said follower being of less depth than the depth of the cup and the said projection adapted to rest against the edge of the said cup to prevent the said follower from moving into proximity to the said shoulder until after the partial completion of an operation.

2. The combination of a die having an opening therethrough, one portion of which is of greater diameter than the other portion thereof, a shoulder separating the said two portions the surface of which extends substantially at right angles to the surface of the portion of the said opening having the larger diameter and the edge of the said shoulder being rounded and the said shoulder being adapted to support an article placed in position to be pressed or formed into shape, a punch adapted to enter the said opening, a follower surrounding the said punch and having an outwardly extending projection adapted to contact with the said article whereby the inner end of the said follower is supported at a distance from the portion of the said article which rests upon the said shoulder.

3. The combination of a die having an

opening therethrough, the diameter of the lower portion of which is less than the diameter of the upper portion thereof and having a shoulder at the end of the enlarged portion upon which a cup-shaped article to be operated on is adapted to be supported, a punch adapted to enter the said opening, a follower of less depth than the said cup-shaped member and which is located between the punch and the cup-shaped member, and means for preventing the said follower from contacting with the bottom of the said cup-shaped member.

4. The combination of a die having a shoulder situated intermediate the top and bottom of said die, the said shoulder being integral with the other portions of the die and having a rounded edge and being adapted to support a cup-shaped blank placed in the said die, a punch adapted to enter the said die to force said cup-shaped article therethrough, a follower on said punch and located in said cup-shaped blank, the said follower having a projecting flange which is adapted to rest upon the top edge of said cup-shaped blank, the distance from the said flange to the bottom edge of said follower being less than the depth of said cup-shaped blank, the bottom edge of the said follower thus being supported above the bottom of the said cup whereby a tendency of the lower edge of the said follower to wedge between the lower end of the punch and the rounded edge of the shoulder is prevented.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 1st day of February, A. D. 1909.

CHARLES A. LINDHOLM.

In the presence of—

CYRUS N. ANDERSON,
CARRIE E. KLEINFELDER.