I. F. KEARNS & G. JENSEN.

Dies for Cutting and Forming Metal Can Tops and Covers.

No. 198,201. Patented Dec. 18, 1877.

FIG. 1.

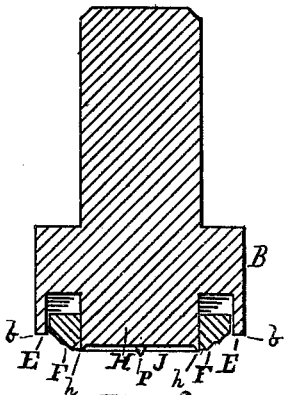


FIG. 2.

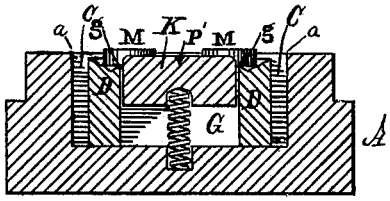


FIG. 4.

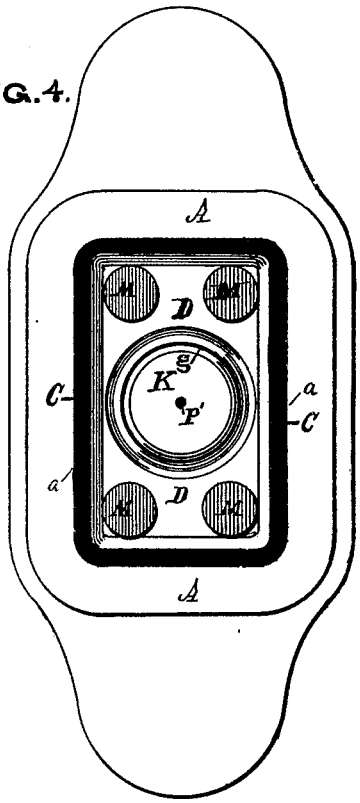


FIG. 3.

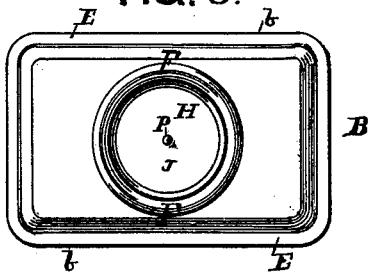
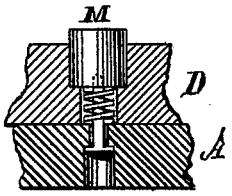


FIG. 5.



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UNITED STATES PATENT OFFICE.

ISAAC F. KEARNS AND GOODMAN JENSEN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DIES FOR CUTTING AND FORMING METAL CAN TOPS AND COVERS.

Specification forming part of Letters Patent No. **198,201**, dated December 18, 1877; application filed June 12, 1877.

To all whom it may concern:

Be it known that we, ISAAC F. KEARNS and GOODMAN JENSEN, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Dies for Cutting and Forming Sheet Metal, of which the following is a specification:

In the accompanying drawings, which form a part of this specification, Figures 1 and 2 represent central vertical cross-sections of the upper and lower dies. Fig. 3 is a face view of the upper die. Fig. 4 is a face view of the lower die. Fig. 5 is a section of one of the spring throw-offs of the lower die.

Like letters of reference indicate like parts in the several figures.

The die shown in the drawing is intended for making oblong can-tops. It cuts out the top, perforates it with an opening, through which the can is to be filled, forms the top, and forms the piece cut out of the opening into a cap suitable for a similar opening in a can of the next smaller size, all at a single operation.

In the said drawing, A is the body of the lower die, provided with cutting-edges at *a*. B is the body of the upper die, having cutting-edges at *b*. These cutting-edges *a b*, upon the descent of the upper die, sever the blank from the sheet of metal placed between the dies. A cavity, C, allows the outer edges of the blank to fold down over the edges of the former D in the lower die, to produce the shoulder of the can-top. This folding is caused by the flange E of the upper die, which enters and nearly fills the cavity C.

The upper surface of the former D in the lower die has such configuration as may be necessary to give the desired shape to the blank; and it operates in conjunction with the forming-surface F of the upper die, which is made yielding by being supported upon springs.

The lower die is provided with a cavity, G, within the former D; and opposed to this cavity in the upper die is a punch, H, provided with cutting-edges *h*, opposed to the cutting-edges *g* of the cavity G in the lower die. The surface of the punch at J is made a forming-surface, to give shape to the metal which it severs; and countering this forming-surface is a yielding spring-supported former, K, placed within the cavity G.

Upon the upper face of the forming-surface D of the lower die may be placed spring throw-offs M, to assist in throwing off the blank after it is formed.

The operation is as follows: The sheet metal being placed upon the lower die, the upper die is caused to descend. The metal is first engaged by the punch H, and pressed down by its cutting-edges until the cutting-edges *h g* and *a b* all come into operation. The yielding former in the upper die and the yielding former in the cavity G of the lower die both back up on their springs until they reach a solid bearing, and the two articles thus cut—namely, the can-top and the can-cap—are formed between the opposing surfaces.

When the die is raised, if the blank sticks to the upper die it is thrown off by the recoil of the spring of the yielding former F. If it adheres to the lower die, the yielding former K, or said former and the throw-offs M, detach it.

The point P, in the center of the punch H, countering a cavity, P′, in the former K, serves to perforate the center of the can-cap with an air-hole.

Having thus described our invention, we claim—

1. The combination, in one instrument, of two cutting and forming dies, consisting of fixed cutting-edges, a fixed forming-surface, and a yielding forming-surface in the lower die, and fixed cutting-edges, a fixed forming-surface, and a yielding forming-surface in the upper die, substantially as specified.

2. The upper die, provided with a yielding former within the cutting-edges of the can-top cutting-die, and a fixed punch for the cap within the yielding former, substantially as specified.

3. The lower die, provided with a stationary former within the cutting-edges of the can-top die, a yielding former for the cap within the cutting-edges of the cap-die, and spring throw-offs on the can-top former, substantially as specified.

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