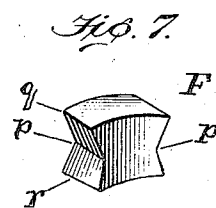
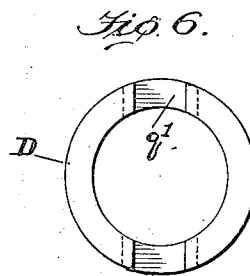
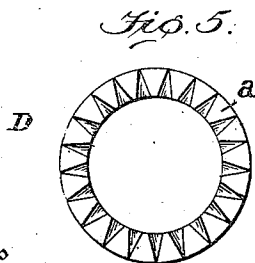
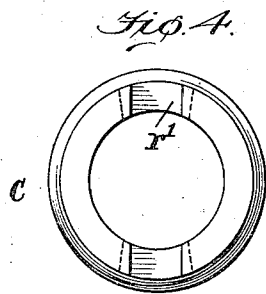
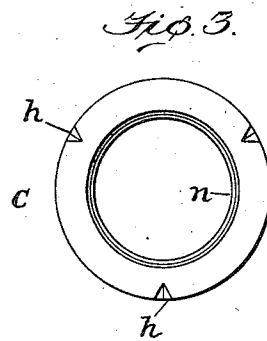
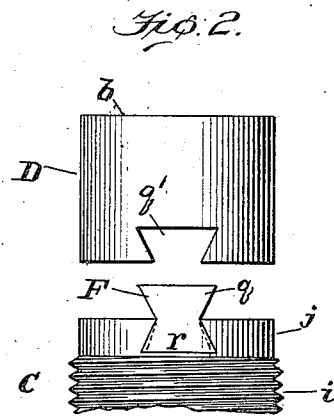
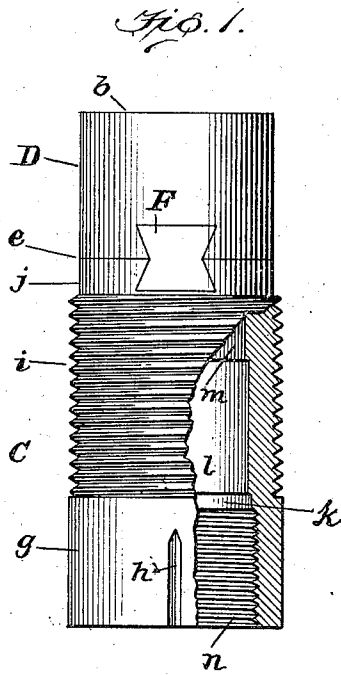


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DIE FOR MAKING BOTTLE CAPS.
APPLICATION FILED FEB. 3, 1912.

1,041,691.

Patented Oct. 15, 1912.



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GEORGE J. SPAHN, OF BALTIMORE, MARYLAND.

DIE FOR MAKING BOTTLE-CAPS.

1,041,691.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed February 3, 1912. Serial No. 675,118.

To all whom it may concern:

Be it known that I, GEORGE J. SPAHN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Dies for Making Bottle-Caps, of which the following is a specification.

This invention relates to dies for forming sheet-metal blanks into bottle caps.

In the dies used in the manufacture of that style of metal bottle-cap known as the "Crown seal", the stationary part of the forming die consists of a one-piece tube and is subject to great wear and requires to be frequently renewed giving rise to great expense. To obviate a large part of this expense I have provided an improved construction of the stationary part of the die which improvement is the subject of the present invention.

The invention will be more fully explained hereinafter with reference to the accompanying drawing in which it is illustrated.

In said drawing Figure 1 is an elevation of the die part, a portion being a side view and a portion a sectional view. Fig. 2 is a side elevation showing the two sections of the die part separated. Fig. 3 is a bottom view of the lower or permanent section of the die. Fig. 4 shows the top edge of the lower tubular section. Fig. 5 shows the top or forming face of the renewable section of the die. Fig. 6 shows the bottom edge of the upper tubular section. Fig. 7 is a perspective view of one of the couplings.

Ordinarily as heretofore used the die parts shown in Fig. 1 constitute one single tubular piece of steel. It is to be understood this die is circular or tubular and that the forming face, *a*, of the die is on the surface at the top rim, *b*. It is the forming face that is subjected to great wear, and heretofore when this has become worn, as it has done in a very short time, the entire die has been rendered worthless and a complete new one has been necessary.

I have devised a construction whereby this tubular die may be made in two sections and have provided special means for joining said two sections.

The lower permanent tubular section, *C*, and the upper renewable tubular section, *D*, are separable and joined at the line, *e*, seen in Fig. 1; the top edge of one section and the bottom edge of the other section merely

abut; the letter, *F*, designates one of the coupling devices that serve to join said two sections. When the working face, *a*, on section, *D*, has become worn, this section is to be renewed; but the lower section, *C*, does not require renewal, this section is permanent and may be used indefinitely with any number of renewed sections—my improved construction for joining and separating said two sections enabling this to be done.

The lower section, *C*, of the die has a smooth round exterior, *g*, which is provided with several vertical grooves, *h*, and above said smooth round part is an exterior screw-thread, *i*, and at the top is a surrounding smooth side, *j*. The interior of the lower section has three different internal diameters, *k*, *l*, and, *m*; the greatest diameter, *k*, near the bottom has an internal screw thread, *n*; next above this thread is a shoulder that forms the second diameter, *l*, that has a smooth wall; and the upper and smallest diameter, *m*, is formed by a second shoulder. These several features of construction in the lower tubular section, *C*, of the die are necessary to cooperate with parts of mechanism that are movable through the tubular parts when operating these dies, and this reference thereto explains why so much expense is involved by the old method of throwing on the junk pile the entire stationary part of the tubular die when the working face, *a*, becomes worn.

As shown in Fig. 1 the upper tubular section, *D*, of the die sets on top of the lower tubular section, *C*; and is joined thereto by two dovetailed couplings, *F*, one being diametrically opposite the other. The two couplings, *F*, though entirely separable from both tubular sections of the die are so constructed as to remain fixed and immovable on top of the lower or permanent tubular section, *C*, but the relation of these couplings to the upper tubular section, *D*, is such as to permit said upper section to be disconnected by sliding it horizontally.

It will be seen the arrangement and diametrically-opposite position on the tubular die, of the two coupling blocks, *F*, leaves the internal tube-part of the die unobstructed, and permits the free movement through the die, as usual, of those parts of the mechanism (not shown), which are used in operating one-piece tubular dies.

Each coupling, *F*, has a V-notch, *p*, on its

two vertical sides; these side notches form an upper dovetail, *q*, and a lower dovetail, *r*. The top edge of the lower tubular section, *C*, has two undercut notches or recesses, *r*¹, whose sides are not parallel but incline slightly, as seen in Fig. 4; these two recesses are diametrically opposite each other. The lower dovetail, *r*, on each coupling has sides that correspondingly incline with the sides of the notches, on the lower tubular section, and these lower dovetails, *r*, fit tightly in the notches or recesses, *r*¹, like a wedge, and therefore the two couplings, *F*, may remain fixed and immovable on the top of the lower tubular section, *C*.

The bottom edge of the upper section, *D*, has two undercut recesses, *q*¹, diametrically opposite each other, but their sides are parallel, as shown in Fig. 6. The upper dovetail, *q*, on each coupling, *F*, has sides that are also parallel, and thereby the upper tubular section, *D*, of the die may be moved horizontally to slide onto the two dovetails, *q*, and thus connect the said upper section securely with the lower section, *C*. If the two sections should be already connected, the upper one, *D*, may be disconnected by sliding it horizontally from the dovetails, *q*.

The dovetail couplings, *F*, are under no special strain when the dies are in operation.

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

A die for forming sheet-metal bottle caps, consisting of a lower tubular section having in its top edge two undercut notches diametrically opposite each other and of tapering dovetail form; an upper tubular section seated on top of the said lower section and its bottom edge having two undercut dovetail notches diametrically opposite each other and of the same width throughout, and two coupling blocks each having reversely-placed dovetailed ends—the sides of one end being different from the other and corresponding respectively with those of the notches in said lower and upper sections.

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

GEORGE J. SPAHN.

Witnesses:

CHAS. B. MANN,
G. FERD. VOGT.