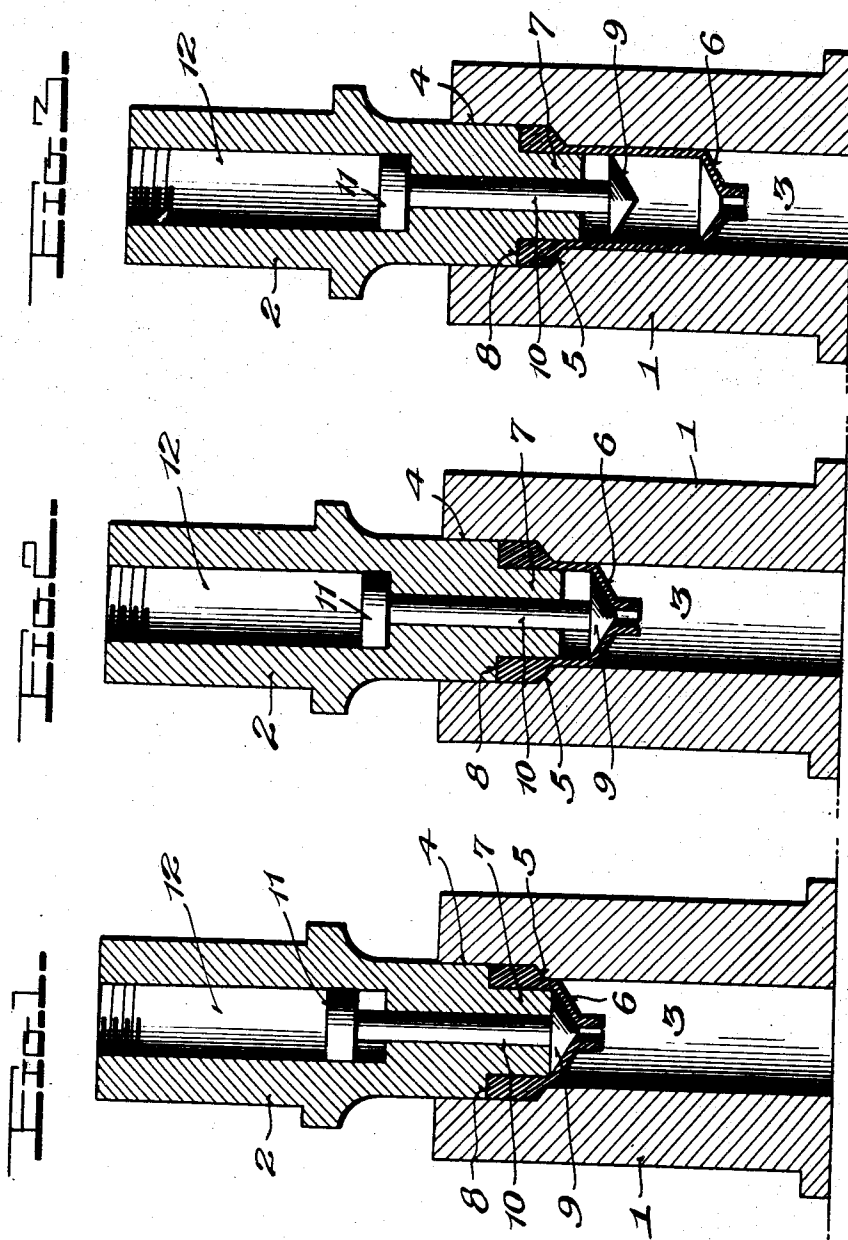


**1,348,007.**

Patented July 27, 1920.



**Witness**

Bessie P. Toomey.

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# UNITED STATES PATENT OFFICE.

WILLIAM C. HUNTOON, OF PROVIDENCE, RHODE ISLAND.

DIE FOR EXTRUDING COLLAPSIBLE TUBES.

1,348,007.

Specification of Letters Patent.

Patented July 27, 1920.

Application filed June 10, 1919. Serial No. 303,179.

*To all whom it may concern:*

Be it known that I, WILLIAM C. HUNTOON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in Dies for Extruding Collapsible Tubes, of which the following is a specification.

This invention relates to certain new and useful improvements in a die for extruding collapsible tubes, and its principal object is to provide an improved structure for extruding the side wall of the tube from a blank in an efficient manner and with means for guiding the newly formed side wall and for preventing the misshaping of the same.

It consists, broadly, of a male and female part, the male part embodying a follower more in the nature of a guide for gaging and guiding the interior of the tube adjacent the point of extrusion whereby the side wall will be of uniform thickness and properly shaped.

The invention further resides in the features of construction and the arrangements and combinations of parts hereinafter described, reference being had to the accompanying drawing wherein,

Figure 1, is a vertical section through the improved die having a blank therein about to be extruded into the tube form;

Fig. 2, is a similar view illustrating the initial step of extruding the side wall of the tube; and

Fig. 3, shows further progress in the extrusion of the tube, the top wall of the tube having left the follower guide.

In my copending application on the art of extruding collapsible tubes, filed June 24, 1919, Serial Number 313,024, a blank is partially shaped in an initial forming-die and subsequently placed in the die constituting the subject matter of the present invention for further extrusion or shaping.

This improved die comprises a female part 1 and a male part 2, the former part being provided with a cylindrical bore or chamber 3 which supports and guides the tube and has one end counterbored, as at 4, to form an inwardly tapering or conical shoulder 5 adapted to support the blank 6 in the shape it is given by the aforesaid initial forming die.

The male part comprises a plunger fitting

the counterbore 5 and having an extension 7 reduced to a diameter less than the chamber 3, the difference in the radii of the chamber and extension determining the thickness of the extruded tube wall.

During the extrusion process pressure is brought to bear on the plunger whereby the square shoulder 8, at the base of extension 7, will force the material for the tube side wall ahead of it and between the concentric walls of said extension and chamber. As the extruded tube leaves the lower end of the extension it is desirable to guide the interior of the tube at a point spaced therebelow to resist any tendency of the side wall of the tube to collapse or the same becoming otherwise misshaped.

To this end a guide 9 is carried by the plunger, the same having a stem 10 slidably fitting an axial bore in the plunger but limited in its sliding movement therein by means of the guide 9 on one end and a head enlargement 11 on its opposite end, said enlargement operating in a counterbore 12. This head may either be acted upon by fluid pressure, by gravity or spring pressure, the design and intent being to have the follower guide 9 leave the end of extension 7 with the top wall of the tube and follow the same for its limit of movement, guiding and steadying the tube. The guide is of a diameter equal to that of the plunger to conform to the top wall of the tube and also to self-center and support the blank.

The guide, by having its normal position spaced a short distance below the end of the plunger and adjacent the point of extrusion provides a second point of contact for the interior of the tube and aids the plunger extension materially in guiding and steadying the tube adjacent the point of formation where the metal is directed inwardly by the inclined shoulder 5.

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

1. A die for extruding collapsible tubes, comprising a female part having a cylindrical chamber of a diameter equal to the outer diameter of the tube, said chamber having one end counterbored to form an internal, blank-supporting shoulder, a male part in the form of a plunger slidably fitting the counterbore and having an extension to a diameter equal to the inner diameter of

the tube, and means carried by the extension for guiding the interior wall of the tube during the extrusion thereof.

2. A die for extruding collapsible tubes, comprising a female part having a cylindrical chamber of a diameter equal to the outer diameter of a tube, said chamber having one end counterbored to form an internal, blank-supporting shoulder, a male part in the form of a plunger slidably fitting the counterbore and having an extension reduced to a diameter equal to the inner diameter of the tube, and means carried by the plunger for movement from the extension with the tube to follow and guide the same during the process of extrusion.

3. A die for extruding collapsible tubes, comprising a female part having a cylindrical chamber of a diameter equal to the outer diameter of a tube, said chamber having one end counterbored to form an internal, blank-supporting shoulder, a male part in the form of a plunger slidably fitting the counterbore and having an extension reduced to a diameter equal to the inner diameter of the tube, and means slidably connected to the plunger extension for limited movement therefrom for guiding the tube during its formation.

4. A die for extruding collapsible tubes, comprising a female part having a cylindrical chamber of a diameter equal to the outer diameter of a tube, said chamber having one end counterbored to form an internal, blank-supporting shoulder, a male part in the form of a plunger slidably fitting the counterbore and having an extension reduced to a diameter equal to the inner diameter of the tube, said plunger having an axial bore extending through the extension, a guide of a diameter equal to that of the latter for guiding the interior of the tube, a stem slidable in the bore through the extension

and carrying the guide on its outer end, and means on its inner end to retain the stem within the extension bore.

5. A die for extruding collapsible tubes, comprising a female part having a diameter equal to the outer diameter of a tube, a male part in the form of a plunger having a diameter equal to the inner diameter of the tube, and means slidably connected to the plunger for limited movement therefrom for guiding the tube during its formation.

6. A die for extruding tubes, comprising a female part, a plunger operable therein, and means carried by the plunger for limited movement therefrom for guiding the tube during the formation thereof and at a point spaced from the plunger.

7. A die for extruding collapsible tubes, comprising a female part having a diameter equal to the outer diameter of a tube, a male part in the form of a plunger having a diameter equal to the inner diameter of the tube, said plunger having an axial bore, a guide for guiding the interior of the tube, a stem slidable in the bore through the extension and carrying the guide on its outer end, and means on its inner end to retain the stem within the extension bore.

8. A die for extruding collapsible tubes, comprising a female part, a plunger operable therein, and a guiding member adapted to lie close against the forward end of the plunger and movably connected to the latter for advancing relative thereto to be spaced therefrom.

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

WILLIAM C. HUNTOON.

Witnesses:

BESSIE P. TOOMEY,  
J. A. MILLER.