Nov. 8, 1960 I. R. THACKER 2,958,924

BULLET SWAGING DIE

Filed Aug. 1, 1958

FIG. 1.

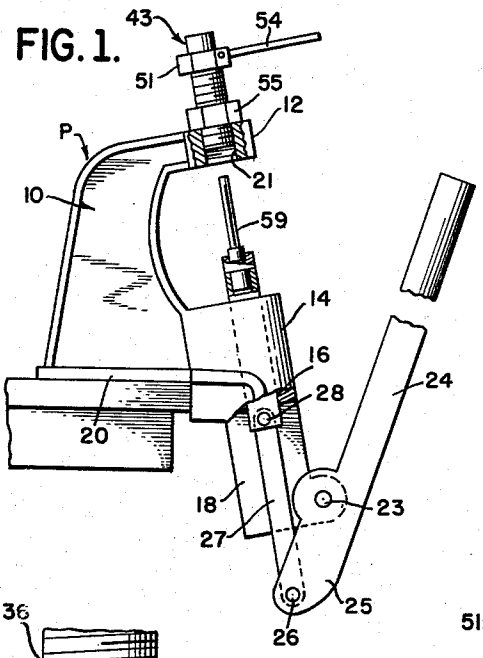


FIG. 2.

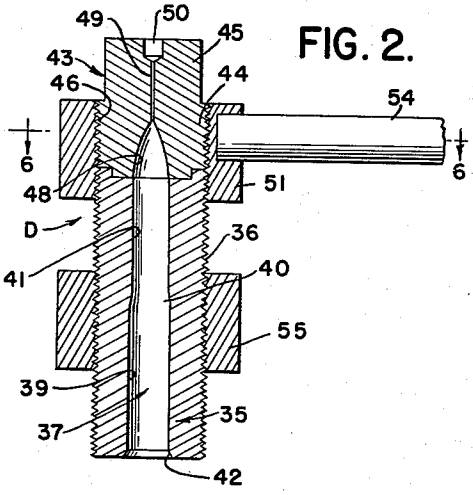
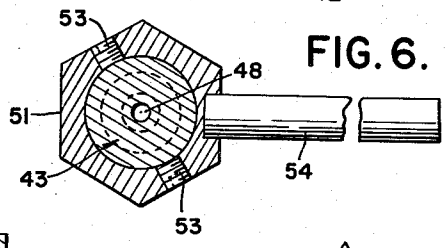


FIG. 6.



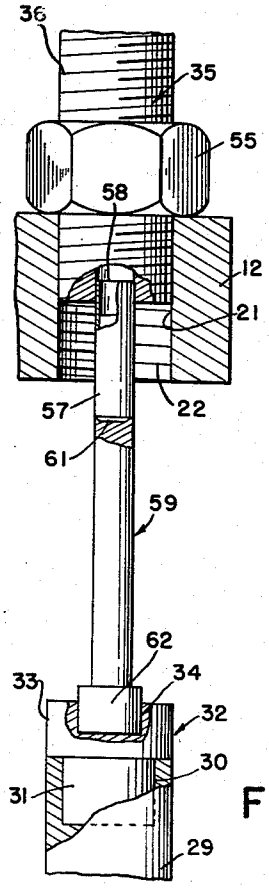


FIG. 3.

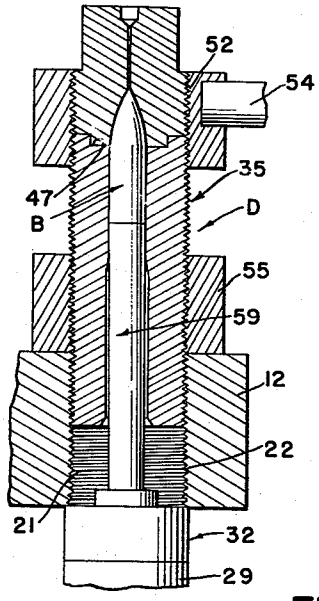


FIG. 4.

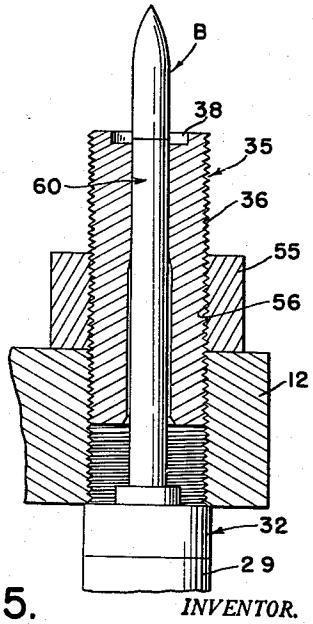


FIG. 5.

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BULLET SWAGING DIE

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1 Claim. (Cl. 29—1.23)

This invention relates to improvements in bullet forming or swaging dies.

According to the present methods or procedures followed in the forming of bullets, after the bullet has been molded or shaped additional operations are required to give the bullet proper size or caliber.

It is accordingly an object of the present invention to provide an improved bullet forming die which can be used in any standard heavy duty reloading press and which produces the bullet completely finished and requiring no further operations such as are necessary in the use of other known types of dies.

Another object of the invention is to provide a new and improved bullet swaging die wherein, after the die has been screwed into the reloading tool or press to the proper depth to form the weight bullet desired, bullets may be swaged to produce or form any one of a number of different ogives or points desired without changing the position of the body of the die or depth thereof in the press.

Still another object of the invention is to provide a new bullet swaging die wherein the face of the bullet forming punch can be machined for any type of bullet base to form the radius on the base of the bullet whereby it may be more easily started into the bullet casing.

Still another object of the invention is to provide a bullet forming or swaging die which is so designed that by using different length jackets and cores, in the production of a jacketed bullet, any weight bullet may be formed in the same caliber by the simple longitudinal adjustment of the die in the loading tool or press.

Still another object of the invention is to provide a bullet swaging die which is adapted to use cast cores or lead wire of the approximate weight desired for the bullet and wherein any excess of the lead will be extruded through the top of the die thereby making unnecessary subsequent swaging operations.

Other objects and advantages of the present invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing with the understanding that the invention is not confined to a strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claim.

In the drawing:

Fig. 1 is a view in side elevation of a conventional form of heavy duty reloading press, parts of which are shown in section, of one type in which the swaging die of the present invention is adapted to be used and showing the die of the present invention set therein for use;

Fig. 2 is a longitudinal sectional view of the die of the present invention showing the same on an enlarged scale;

Fig. 3 is a fragmentary detail view partly in section and partly in elevation illustrating the beginning of the operation of forcing a bullet jacket and core into the body of the die by the punch, the latter being supported in the socket of punch holder;

Fig. 4 is a longitudinal section through the die together with a portion of the head of the die press in which the die is mounted and showing the punch and punch holder at the limit of their movement where the punch holder engages the head of the reloading press in the formation of the bullet in the die head and body;

Fig. 5 is a sectional view corresponding to Fig. 4 but showing the die head removed and illustrating the use of a longer punch to effect the removal by the die press of the formed bullet from the die; and

Fig. 6 is a cross section taken substantially on line 6—6 of Fig. 2.

Referring now more particularly to the drawings, the reference character P generally designates one well known type of reloading press with which the present swaging die may be used. In this connection, it is to be understood that the illustration of this particular type or form of press is in no manner intended to be limiting upon the form or use of the swaging die illustrated and claimed as such die may be used in any number of standard or conventional reloading presses.

In the press here illustrated, it will be seen that the body of the press is substantially in the form of the letter C and is generally designated **10** and comprises a head portion **12** forming an integral part of the top of the C and an elongated guide **14** carried by the lower portion of the C and which guide is formed with an axial bore **16** which at its lower end opens into a slot **18**.

The base **20** of the body is adapted to be mounted upon any suitable supporting bench or table to which it can be secured in any desired manner, and the lower end of the guide **14** projects below the base and the bore **16** of the guide **14** is axially aligned with the opening or passage **21** through the press head **12** and which opening or passage is provided throughout its length with the screw threads **22** as shown.

The lower end of the guide **14** has pivotally supported across the front side of the slot **18**, on a transverse pivot pin **23**, the lower end of a lever **24** which projects, as indicated at **25**, below the slotted portion **18** of the guide and is pivotally connected at **26** with a link **27**, the upper end of which link is pivotally connected as at **28** with the lower end portion of a conventional shell holder **29**. The upper end of this shell holder is socketed as at **30** to receive the reduced end portion **31** of the punch holder **32**. The upper end or top of this punch holder **32**, designated **33**, is of an over-all diameter slightly greater than the diameter of the passage **21** through the press head **12** for the purpose hereinafter set forth and the punch holder has the upwardly opening socket **34** at the top thereof to receive the lower end of the bullet forming punch.

The die of the present invention is generally designated D.

The die comprises the elongate circular body which is generally designated **35** and which is externally screw threaded throughout its length as indicated at **36** and of an over-all diameter to be threaded into the opening or passage **21** of the press head **12**.

The die body **35** has the axial swaging passage or bore **37** formed longitudinally therethrough and the top end of the body **35** is milled out to form the circular seat or recess **38** for the purpose hereinafter disclosed.

The die passage **37** is reduced in diameter from the bore end of the body **35** to the upper end where the passage opens into the recess **38**, the larger portion or part of large diameter being designated **39** and which extends approximately halfway through the length of the body **35** where it is gradually reduced as indicated at **40** to join the upper portion **41**, which is of smaller diameter as shown.

The outer or lower end of the part 39 of the die passage 37 is chamfered as indicated at 42 to facilitate starting the bullet or bullet jacket and core into the swaging or die passage 37 as hereinafter set forth.

The die includes, as an extension of the body portion 35, the head 43 which comprises a lower portion 44 and an upper portion of slightly smaller diameter as indicated at 45. The lower portion 44 of the die head 43 is screw threaded as indicated at 46 and is of the same outside diameter as the body 35.

The lower end of the die head 43 is turned down to form the circular concentric boss 47 which is of a diameter to fit snugly into the circular recess 38 and of a depth to equal the depth of the recess 38 whereby the bottom face of the head 43 and the top end of the body 35 can be brought into firm and tight contact one with the other.

Formed axially in the die head 43 and in the bottom or lower portion 44 thereof is the bullet nose forming die cavity 48 which is shaped to give the desired ogive form to the bullet nose or point and the diameter of this cavity 48 at the base where it opens through the bottom portion 44 approximates the diameter of the upper portion 41 of the die passage 37 which determines the caliber of the bullet.

Leading upwardly from the tapered end of the cavity 48 is the bore 49 which is provided for the escape of excess lead forced into the die in the forming of the bullet and this passage opens out through the top end of the die head 43 as indicated at 50.

The numeral 51 generally designates the coupling nut by which the die head 43 and body 35 are joined together and this nut, as shown, is of an inside diameter and is screw threaded as at 52, to threadedly receive the top end of the body 35 and the lower portion 44 of the die head 43. When these two members are threaded together in the nut 51 it will be seen, as illustrated in Figs. 2 and 4, that the two parts are tightly joined together and by reason of the interlocking connection provided by recess 38 and boss 47 the escape of lead between the joined bodies will be positively prevented when the bullet material is forced by the press into the die.

The die head 43 may be secured against movement in the nut by means of set screws 53 and after the head has been set it can be easily and quickly screwed down to position against the upper end of the body 35 by means of the lever or arm 54 which has an end secured in the side of the nut 51 as illustrated.

In addition to the head nut 51, there is provided a second nut 55 which is screw threaded as indicated at 56 to receive the die body 35. This nut holds the die in set position when the lower end of the body 35 is threaded in the press head 12.

In the operation or use of the present invention, the body 35 of the die is screwed into the reloading press to the proper depth to form the weight bullet desired and the setting nut 55 is then threaded down on the body 35 until it is bearing firmly against the top of the press head 12 in the manner illustrated in Fig. 1.

The head nut 51 with the die head 43 threaded thereinto, is then threaded onto the upper end of the body 35 as illustrated in Figs. 2 and 4 until the lower end or lower portion 44 of the die head 43 is brought to bear firmly against the top end of the body 35 as illustrated in these figures.

In Fig. 3, the numerals 57 and 58 designate respectively the jacket which is to encase the lead core of the finished bullet and the lead core which will be compressed and distributed through the jacket when the latter and core are forced into the swaging smaller portion 41 of the passage 37 and into the bullet nose forming die cavity 48.

The bullet jacket and core shown in Fig. 3 are properly lubricated and then mounted on the upper end of the forming punch which is here designated 59. Two of these punches are provided in the present invention and the punch 59 is employed for forcing the bullet and core into the die while a longer punch designated 60 in Fig. 5 is employed for forcing the finished bullet from the die.

The shorter punch 59 may be machined out as indicated at 61 to any desired form for the formation of a desired bullet base.

The punch die 59 as shown comprises a cylindrical rod or pin having an enlarged base portion 62 which is of the proper dimensions to fit into the socket 34 in the punch holder 32 while the opposite or advancing end is machined out as stated, and as indicated at 61, to form the desired type of bullet base.

After lubricating the bullet jacket and core and mounting the latter upon the advancing or upper end of the punch die 59 in the manner shown in Fig. 3, the jacket and core are introduced into the lower portion 39 of the die body passage 37 with the base 62 of the punch resting in the punch holder as shown.

The top of the die or die head is first turned or pulled down tight as shown in Fig. 2 and then by operation of the lever 24 the shell holder or ram body 29 is forced up and the bullet jacket and core are forced into the die passage 37 and as the same pass across the constriction 40 from the lower portion 39 into the smaller portion 41, the bullet size will be formed and further operation of the lever 24 will force the advancing end of the jacket with the lead core therein into the bullet point forming die cavity 48 to squeeze or swage the nose of the bullet into the desired shape. The amount of lead placed in the jacket is such as to completely fill the core when the forward end of the jacket is squeezed down but if there is any excess lead it will be ejected from the advancing end of the jacket into the escape bore 49. The jacket and core will be advanced by the punch pin 59 until the advancing end of the punch holder strikes the underside of the press head 12 at which time the core and the jacket will be advanced into the proper position in the die to form the bullet of the proper size or caliber and nose or point shape.

The completed bullet designated B in Figs. 4 and 5 is now ready for removal from the die. For this operation the ejector pin 60 is employed which pin is of the same form as the punch pin 59 with the exception that it is longer and does not need to have the advancing end recessed.

The head nut 51 is now removed and the pin 59 replaced by the longer pin 60 whereupon the longer pin is advanced through the body 35 and ejects the finished bullet completed and properly sized from the body 35 as illustrated.

It will be readily apparent from the foregoing that by the provision of the removable die head 43 mounted in the carrier nut 51, die heads having sockets of different form for the swaging of bullet points of different designs can be readily mounted on the body 35 without changing the setting or position of this body in the reloading press. Thus, after the proper setting of the body 35 has been attained for the production of a bullet of desired weight, any number of bullets can be formed of the same weight but with different shaped points merely by removing the nut 51 and changing the head 43. Also, it will be seen that the bullet seat is formed and reamed with the die parts screwed together in the manner shown.

To use the swage in different presses, the only change necessary to be made would be in the punch holder 32.

Where bullets of different weights are to be formed, any weight can be obtained by using different lengths of jackets and cores while making the bullets of the same caliber, by adjusting the die in the loading tool up or down as required. No core swaging is required with the present dies as use can be made of cast cores or lead wire of approximate weight desired and the excess lead will be extruded through the top of the die by way of the bore 49.

Also, in the present die the two parts of the die are held together in perfect alignment so that the finished bullet, when removed from the die, has no ridge or fin at the line of abutment between the parts 35 and 43 and there is obtained a perfect finished bullet which does not need to be run through a separate sizing die to remove any fin as is sometimes required in the use of other dies.

I claim:

A bullet swaging die comprising an elongate body, a head, said body having an axial bullet swaging bore therethrough and further having a top end provided with a shallow circular recess concentric with the bore, the recess having a relatively large flat bottom surface and the end of the body presenting a flat face around the recess and in a plane paralleling the plane of the bottom of the recess, the body being externally screw threaded throughout its length, said head having a length less than the body and having a portion of its length from one end of a maximum diameter equal to the outside diameter of the body and said portion of maximum diameter being externally screw threaded, the head at said one end having a circular concentric boss adapted to fit in and seat flatly upon the flat bottom of said recess, and the said end of the head around the boss seating flatly upon said flat face around the recess, said head having an ogive bullet nose forming die cavity in the said one end thereof for registration in the base portion with said swaging bore and said base portion of the die cavity being of the same diameter as the end of the bore with which it registers, said swaging bore having one

diameter through approximately half its length then tapering to a reduced diameter to the top end of the body where it joins the nose forming die cavity, a coupling nut threaded to receive both the threaded portion of the head and the end of the body which the head joins, screw means carried by the nut for engagement with the head for locking the head and nut in an adjusted relation one with the other, said head having an excess lead escape bore extending axially from the die cavity through the other end of the head, said body being adapted to be threaded at its other end into a reloading press, a setting nut threaded on the body for fixing the portion of the body in the reloading press, said setting nut being positionable anywhere along the body between the press and the coupling nut, and a handle member secured to the coupling nut for facilitating the application of the coupling nut and head to the top end of the body, said head being set and secured in the coupling nut by said screw means whereby upon the threading of the coupling nut onto the top end of the body, said boss will seat firmly in said recess.

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