

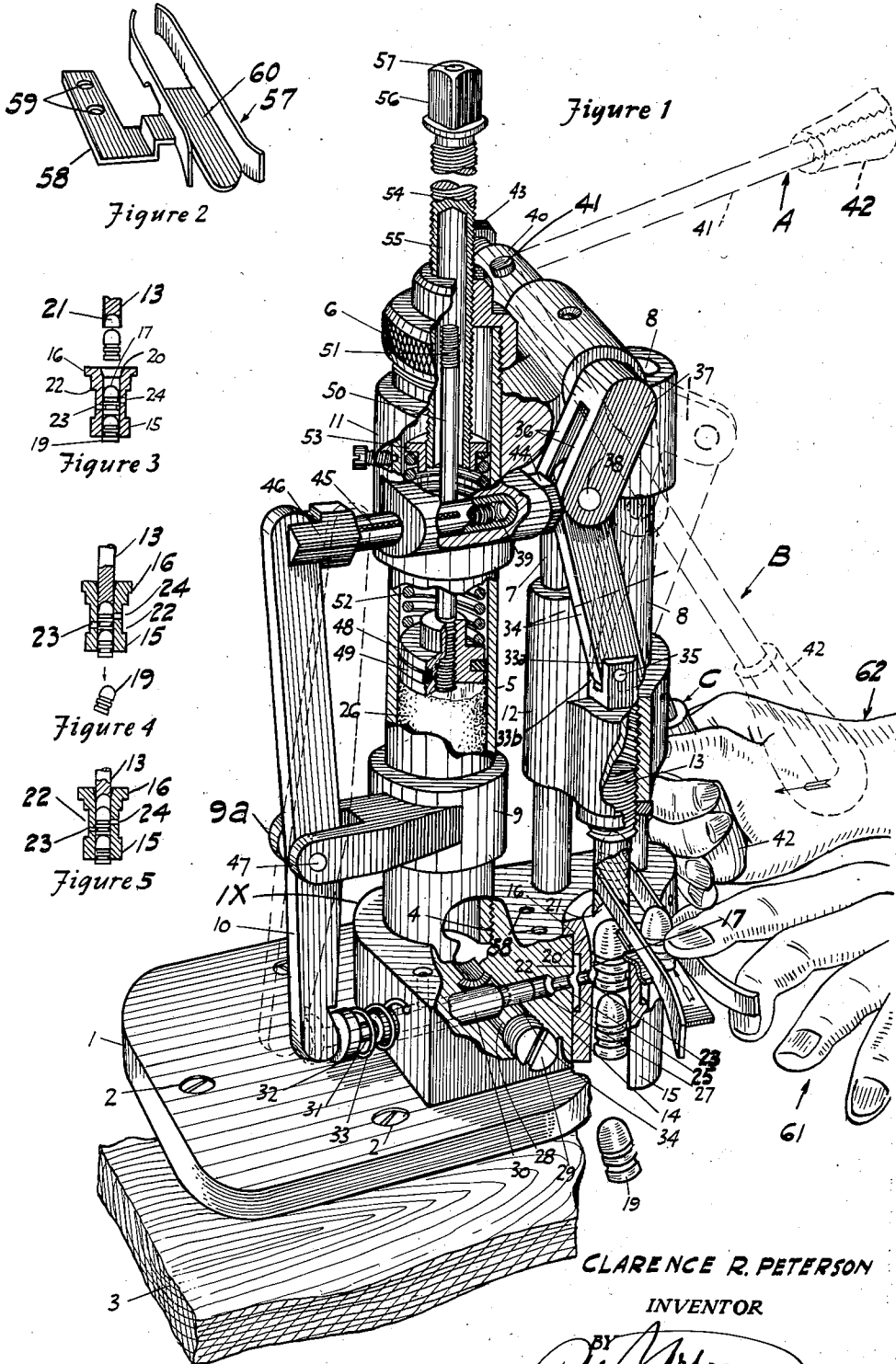
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BULLET SIZER AND GREASER

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BULLET SIZER AND GREASER

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This invention relates to mechanism involved in the work cycle of sizing and greasing a bullet.

It has become a widely practiced custom amongst amateur sportsmen, police officers, riflemen and the like to re-load their blank cartridges and thus save considerable expense over having to purchase new ammunition each time target practice or game shooting and the like is indulged in to test one's marksmanship.

When such activity is practiced it becomes necessary for the several individuals to provide their own bullets and such bullets are either cast at home and carried to the place of shooting, or both cast and reloaded into the blank cartridges at the rifle ranges or places of shooting.

In either event the bullets, as they come from the mold, are not cast exactly true to the correct calibration. Hence they are not at once ready to be placed in the cartridge container and accordingly must be sized. In addition to the sizing operation the well known greasing operation must also be performed.

It is therefore an important object of the present invention to provide a fast and accessible hand operated tool which is portable and wherein the operation of sizing and greasing a hand or otherwise cast bullet takes place completely in a single work cycle thereby saving considerable time in performing the operation.

Further objects and features of the invention reside in the details of construction, the novel combination and arrangement of parts all of which will be later described in detail in the disclosure following, and particularly pointed out in what is claimed.

The device as now reduced to practice is shown in the accompanying drawing and comprises the following figures:—

Fig. 1 is a perspective view of the invention, some parts being broken away to show details of parts otherwise hidden from view.

Fig. 2 is a perspective view of the magazine for manually feeding the bullets to the sizing and greasing die.

Figs. 3, 4 and 5 are longitudinal cross sections taken thru the sizing die and fragmentally show a portion of the bullet punch and illustrate the various stages of operation the bullet passes thru in the work cycle of sizing and greasing.

Referring now in detail to the drawing, the numeral 1 indicates the base whereby, by means of screws 2, the device as a whole may be mounted upon a support 3.

The base 1 is provided with a raised portion 1a having therein a screw threaded socket 4 into

which is screwed one end of the pipe 5, the other end of said pipe being also threaded so as to have screwed thereonto the sealing nut 6. The base 1 is also provided with spaced cylindrical sockets into which are fitted and secured guide rods 7 and 8.

There is mounted on the pipe 5, in spaced relation to said base, a casting part 9 having a yoked extremity 9a providing a fulcrum seat upon which is pivotally mounted the lever 10. On the pipe 5, in spaced relation to the casting 9 and the base 1, is mounted a second casting or part 11, the latter part having a cylindrical socket in which is fitted the upper end of the rod 7, and a cylindrical bore in which is fitted the upper end of the rod 8.

A ram 12 is slidingly mounted on the guide rods 7 and 8, and said ram is provided with sufficiently protruding stock adjacent its sliding mounting for having tapped into it the bullet punch 13. In the base 1, in axial alinement with the threaded socket whereinto the punch 13 is screwed, is drilled or otherwise formed a cylindrical opening 14 into which may be detachably secured the sizing and greasing die 15.

The die 15 is shown in Figs. 3, 4 and 5 on a rather small scale and in Fig. 1 on a more enlarged scale. The body portion of the die is made cylindrical to conform to the opening 14 into which it is fitted, and there is an annular flange 16 near its top face which rests on the base 1, whereby its position is maintained thereon. The die has a sizing opening 17 extending axially therethru, and the bullet 19 passes thru this opening in two separate stages during the work cycle; one stage being that of sizing, and the other being that of greasing. Said die has a flared entrance opening 20 into which the bullets are first manually fed one at a time incident to sizing, and it is at this point of entrance that the ogival socket 21 of the punch 13 is properly engaged with the ogival portion of the bullet, so that the passage of the bullet thru the die, when the ram is depressed, may be axial and concentric with the opening 17 as well as with the bullet punch and socket 21.

The die 15 is provided with an annular recess 22 extending circumferentially therearound, and there are ports 23 and 24 in stepped relation with one another which communicate with said recess. Said ports register with the grease grooves of the bullet after the completion of the work cycle of sizing has been completed. In the wall of the base communicating with the opening 14 is an aperture 25 wherethru a grease or lubricant 26 is

ejected into said recess, there being other passages 27 and 28 which are drilled in the base 1 for the purpose of conducting the lubricant 26 from the pipe 5 to the recess 22 as will be presently described.

The passage 27 is drilled in the base 1 concentric with and opening into the aperture 25, and the passage 28 is drilled laterally to the passage 27 so as to intersect the same and connect with the bottom wall of the socket 4 thru which the lubricant is first dispensed. Passage 28 is closed from the outside by means of the screw stud 29.

In the wall of the base 1 is fitted a bushing 30 which terminates at the point of intersection of the passages 27 and 28. In this bushing is slidably fitted a plunger 31. Said plunger is provided with a flat head 32 and between this head and the wall of said base is fitted a compression spring 33 to keep the point 34 of the plunger normally retracted to a point approximately in line with the end of the bushing 30 as dottedly indicated.

The head 32 of the plunger 31 contacts with the lower end of the lever 10 which bears thereagainst at all times so as to be in readiness for the continuance of the work cycle which includes the operation of greasing.

The plunger 31 may be termed also a pump plunger or an auxiliary pump or booster to assist in forcing the lubricant, normally undergoing pressure, thru the passage 27 into the annular recess 22 and thence thru the ports 23 and 24 into the grooves proper of the bullet.

Referring back to the ram 12, the mechanism whereby this instrument is reciprocated on the guide rods 7 and 8 will now be described.

That portion of the ram which was termed as the protruding stock is fitted with an integral upstanding pair of jaws 33a and 33b and between them is pivotally mounted one end of the lever 34 by means of the pin 35. Said lever has its other end pivotally mounted between the jaws 36 of the link 37 by means of the pin 38. The lever 34 and the link 37 jointly form a toggle-joint, the elbow of which predeterminedly contacts with the adjustable operating bolt 39 coincidentally with that part of the work cycle which begins the greasing operation.

The link 37 is mounted upon a shaft 40 which extends transversely thru the topmost portion of the casting 11, and thru that portion of the shaft which extends beyond said casting is inserted an operating lever 41 provided with a hand grip 42 screwed thereonto. Said lever 41 is held in fixed relation to the shaft 40 by means of a stud 43 tapped into the free end of the shaft so as to bear thereagainst.

The link 37 as well as the lever 41 has a definite angular spacing on the shaft 40 on which they are mounted. The lever 41 is manually operated to perform the work of sizing and greasing the bullet. I term the cycle thru which the lever 41 moves thruout the time it is manipulated from the position A, thru position B, and down to and including position C, which concludes the greasing operation, a working cycle. In this cycle by virtue of the definite relation which the link 37 and the lever 41 bear to the shaft 40, the bullet 19 is passed thru the first stage, that of sizing, by depressing the lever 41 to position B. At the completion of this portion of the stroke the groove or grooves of the bullet are left in register with the ports 23 and 24 of the die. The bullet remains stationary in this position after the greasing operation until another

bullet is sized and the next bullet to be sized is caused to take its place. After the train of mechanism, including the lever 34 and the link 37, has advanced the bullet to the position of greasing, that position being the end of the maximum stroke of lever 34 and link 37, the pin 38 and the toggle-joint or elbow immediately pass dead center and the parts which originally advanced the bullet to the greasing stage now start retracting carrying with them the bullet punch 13, which up to that time remained in contact with the bullet. After passing dead center the elbow aforementioned starts upon the work cycle of operating the bolt 39 to perform the greasing operation. The description of those parts which are involved in the work cycle of greasing will now be continued.

The bolt 39 aforementioned is slidably mounted in a drilled slot provided therefor in the casting 11, and in the same plane with the movable parts 34 and 37 so that the elbow of the toggle-joint will contact with the head 44 of the bolt 39 immediately upon reaching dead center. Said head 44 is of a polygonal shape and may have a wrench applied thereto for adjusting the distance between it and the elbow whereby the stroke of the plunger 31 is regulated.

For the purpose of arriving at a definite form of adjustability wherein I regulate the plunger stroke, I slot the free end of the bolt 39 and tap thereinto a stud bolt 45 having a slotted head 46 into which the upper end of the lever 10 plays. Rotating the head 44 in a clockwise direction diminishes the plunger stroke and rotating the head in an anti-clockwise direction increases the plunger stroke. The fact that the bolt whereinto the stud 45 is tapped is slotted insures that the bolt will remain fixed in the selected rotational adjustment. The lever 10 is tiltingly mounted in the yoked extremity of the casting 19 by means of the pin 47. This fixed relation of the lever and casting insures the contactability of the ends of the lever with its cooperating parts at all times.

Returning now to the description of the parts associated with the pipe 5, which has already been described as being screwed into the socket 4 and providing a support for the castings 9 and 11, as well as a chamber from which the special lubricating compound 26 is dispensed, said parts are correlated in such a manner as to insure an automatic feed of the lubricant from the pipe chamber from which it is dispensed. This automatism is accomplished by mechanism comprising a yieldably applied floating piston construction including a piston 48 having a sealing ring 49 into which is screwed one end of the piston rod 50; the free end of said rod being threaded at 51 whereby, as described later, the removal of the piston assembly may be effected. Around the piston rod and resting upon the exposed face of the piston is wound a coiled spring 52. Upon said spring is placed a spring seat member 53 and compression is set up in the spring by screwing a compression bolt 54 thru the sealing nut 6 and causing the end of said bolt to bear upon said seat member. Said bolt 54 is provided with an internal bore 55 into which the piston rod may extend as the spring is compressed from time to time to cause pressure to be exerted on the lubricant. The bolt 54 has its protruding end developed into a square head 56 to which a wrench may be applied for screwing said bolt in and out of the sealing nut 6. Said square head contains an internally threaded bore 57

which is screwable onto the threaded portion 51 of the piston rod 50 to provide means for applying traction when it is desired to remove the piston 48 from the pipe 5 for the purpose of adding a new supply of grease thereto. At such time the sealing nut 6 is merely removed and the ends of the compression bolt 54 reversed to perform the necessary operation. Several thousand pounds per square inch of pressure may thus be brought to bear upon the grease to cause it to exude thru the various channels leading into the greasing die.

As a means for feeding bullets to the die 15 whereby they may be sized and greased as set forth in the preceding description, I provide a bullet guide attachment 57 which may be applied to the holes 58 in the base 1 by means of suitable screws tapped thereinto.

Fig. 2 shows the attachment in perspective. Said attachment comprises an attaching arm 58 provided with holes 59 thru which the attaching screws are inserted to fasten it to the base. Said arm depends from a bullet race-way 60 which is stepped to a higher level in order to extend over the mouth of the die. The manner in which the bullets are fed thru the race-way into the die is clearly taught by the drawing.

The work cycle of sizing and greasing begins at the time the handle 42 is grasped at position B, which is the normal resting position of all the parts. From this point the handle is elevated to position A thus permitting a bullet to be fed thru the bullet-race 60, by the hand 61, into the die 15. The use of the magazine feed is optional since the hand 61 can hold a supply of bullets and they can be inserted by the fingers immediately into the tapered mouth of the die.

In order to place the device in readiness for operation, the die is properly inserted in the raised portion of the base, the bolt 39 and stud 45 are properly adjusted, and the reservoir is supplied with the proper lubricant upon which pressure is being applied from the spring 52 sufficiently at least to cause the grease to exude thru the various channels until its appearance is noted at the ports 23 and 24 in the die.

When the handle 42 is at position A parts 34 and 37 are in the dottedly indicated position. Manually depressing the handle 42 from this position causes parts 34 and 37 to advance the ram 12 containing the bullet punch 13 downwardly until the ogival socket 21 contacts with the ogival head of the bullet whence the sizing operation begins. Continuing the downward stroke the parts 34 and 37 will reach the limit of their stroke which is position B of the lever 41, the bullet will thereupon be sized and placed in greasing position as shown in Figs. 1 and 4.

Concurrently the elbow of the toggle, of which the levers 34 and 37 form the parts, contact with the head 44 of the bolt 39. Bringing pressure to bear upon the handle 42 by the hand 62 at this stage of the operation causes the elbow to operate the bolt 39 to, in turn, rock the lever 10 about its pivotal support 47 from dotted to full line position. The movement of the latter parts advances the plunger 31 in the sleeve 30 forcing the grease in the recess 22 out thru the ports 23 and 24 into the grooves of the bullet. Rotating the nut 56 on the bolt 54 in a clockwise direction would, in the absence of the parts involved in the greasing cycle just described, produce a similar exudation of the grease into the grease grooves of the bullet. At the beginning of the greasing cycle the punch 13 will start retracting as shown in Fig. 5, thus leaving the bullet grooves in registry with the

ports of the die until one greased bullet is displaced by another to be greased. It will thus be seen that in a single work cycle the complete sizing and greasing of a bullet may be effectively accomplished.

What is claimed:

1. In mechanism for performing the work cycle of sizing and greasing a bullet, a support, a die having grease feeding channels mounted on said support, a reservoir containing grease under pressure mounted on said support, there being a duct communicating with said reservoir and the channels in said die, means carried by said support wherewith to perform the sizing operation on the bullet and place it in position for greasing, and means actuated by the parts employed in performing the sizing operation to exert additional pressure on the grease to augment its flow thru said die channels into the grease grooves of the bullet.

2. In mechanism for performing the work cycle of sizing and greasing a bullet; means for supporting a die wherewith to size said bullet, means wherewith to feed said bullet to said die, means manually operable wherewith to perform the sizing operation and to place said bullet in position for greasing, grease feeding means including a grease feeding plunger, and said manually operable means being operatively related to said grease feeding plunger whereby continuing the cycle of the sizing operation to exert additional pressure on the grease to augment the feeding thereof from the grease feeding means into the grease grooves of said bullet.

3. In a device of the kind described, a base, a detachable die supported by said base, means attached to said base for manually feeding a bullet to said die, a ram including a punch wherewith to perform the sizing operation of said bullet, manually operable means to operate said ram, a reservoir containing a lubricant under pressure, there being a duct communicating with said reservoir and the interior of said die, said punch at the completion of the sizing operation advancing the groove of said bullet to a registry position with respect to said duct, and booster means operatively related to said manually operable means for exerting additional pressure on said lubricant to eject it into said groove.

4. In a device of the kind described, a base, a die mounted upon said base, said die having an elongated bullet passage extending therethru, manually operable means mounted upon said base to force a bullet thru said passage in order to perform the bullet sizing operation, a grease reservoir, including a floating piston under pressure mounted upon said base having a feeding passage communicating with the passage in said die, and pressure means automatically actuable by said manually operable means to accelerate the feeding of the grease into the die thru said grease feeding passage.

5. In a device of the kind described, a base, a detachable die supported by said base, means attached to said base for manually feeding a bullet to said die, a ram including a punch wherewith to perform the sizing operation of said bullet, manually operable means to operate said ram, a reservoir containing a lubricant under pressure, there being a duct communicating with said reservoir and the interior of said die, said punch at the completion of the sizing operation advancing the groove of said bullet to a registry position with respect to said duct, auxiliary means operable by said manually operable means for addi-

tionally compressing said lubricant to force it into the grooves of said bullet, and mechanism operatively relating said auxiliary means and said manually operable means whereby to perform the latter function.

6. In a bullet sizing and greasing tool, a chamber having an intake and discharge end for containing a lubricant, a nut screwed on to the intake end of said chamber, said nut having an internally threaded reduced portion, a floating piston in said chamber, a piston rod, one end of said piston rod being normally free and threaded and the other end being threaded and screwed into said piston, a coil spring wound around said piston rod and resting upon said piston for exerting pressure on said lubricant, a spring seat resting upon the exposed end of said spring, a compression bolt screwed into the internally threaded reduced portion of said nut, the inner end of said bolt engaging said seat to compress said spring, said bolt having an internal bore into which the threaded end of said piston rod extends as said bolt is screwed down to compress said spring, and said bolt having its exposed end internally threaded to screw onto the end of said rod whereby to withdraw said piston from said chamber.

7. In a device of the kind described, a base having an opening for receiving a bullet sizing and greasing die, there being a socket in said base and grease channels communicating with said socket and said opening, means screwed into said socket and providing a receptacle for the storage of a grease, mechanism mounted upon said means exerting a pressure on said grease to cause it to automatically exude thru said channels into said opening, and other means exerting additional pressure on said grease to augment the exuding thereof.

8. In a device of the kind described, a base having an opening for receiving a bullet sizing and greasing die, there being a socket in said base and grease channels communicating with said socket and said opening, means screwed into said socket and providing a receptacle for the storage of grease, mechanism including a floating piston, and means mounted upon said piston exerting a pressure on said grease to cause it to automatically exude thru said channels into said opening, a plunger mounted in said base and projectable into said channels to exert additional pressure on said grease whereby to augment the exudation thereof, and mechanism mounted upon said device to operate said plunger.

9. In a device of the kind described, a base having an opening for receiving a bullet sizing and greasing die, there being a socket in said base and grease channels communicating with said socket and said opening, means screwed into said socket and providing a receptacle for the storage of grease, mechanism including a floating piston and means mounted upon said piston exerting a pressure on said grease to cause it to automatically exude thru said channels into said opening, a plunger mounted in said base and projectable into said channels to exert additional pressure on said grease whereby to augment the exudation thereof, and mechanism mounted upon said device to operate said plunger, said mechanism including adjustable means for varying the stroke of said plunger.

10. In a device of the kind described, a base having an opening for receiving a bullet sizing and greasing die, there being a socket in said base and grease channels communicating with said socket and said opening, means screwed into

said socket and providing a receptacle for the storage of grease, mechanism including a floating piston and means mounted upon said piston exerting a pressure on said grease to cause it to automatically exude thru said channels into said opening, a plunger mounted in said base and projectable into said channels to exert additional pressure on said grease whereby to augment the exudation thereof, and mechanism mounted upon said device to operate said plunger, said mechanism including adjustable means comprising parts fixedly held in selective rotational adjustment for varying the stroke of said plunger.

11. In a device of the kind described, a base having an opening for receiving a bullet sizing and greasing die, there being a socket in said base and grease channels communicating with said socket and said opening, means screwed into said socket and providing a receptacle for the storage of grease, mechanism including a floating piston and means mounted upon said piston exerting a pressure on said grease to cause it to automatically exude thru said channels into said opening, a plunger mounted in said base and projectable into said channels to exert additional pressure on said grease whereby to augment the exudation thereof, mechanism mounted upon said device to operate said plunger, said mechanism including adjustable means comprising parts fixedly held in selective rotational adjustment, and a lever operated by said parts for actuating said plunger.

12. In a device of the kind described, a base, a die mounted upon said base, said die having an elongated bullet passage therethru, manually operable means mounted upon said base to force a bullet thru said passage in order to perform the bullet sizing operation, a grease reservoir mounted upon said base having a feeding passage communicating with the passage extending thru said die, a piston afloat on said grease, yieldable means acting on said piston to exert pressure on said grease, and means automatically actuable by said manually operable means whereby to exert additional pressure on said grease to accelerate the feeding thereof into the die thru said grease feeding passage to automatically accelerate the feeding of the grease into the die thru said grease feeding passage, said means being operatively related to said manually operable means and being timed to feed the grease to the bullet during its passage thru said die.

13. In a device of the kind described, a base, a die mounted thereupon, said die having a bullet passage therethru, a ram movable lengthwise of said passage to force a bullet therethru, means to operatively mount said ram upon said base, a lever having a handle portion and pivotally mounted upon said base to actuate said ram, grease supplying means mounted upon said base and having a passage to feed a predetermined quantity of grease into said bullet passage simultaneously with the movement of said bullet thru its said passage, and grease feeding means comprising a grease feeding plunger and a lever pivotally related between its ends to said base, one end of said lever being operatively related to said grease feeding plunger and the other end of said lever being operatively related to the first recited lever.

14. A support, a bullet sizing die having grease feeding channels mounted on said support; a reservoir containing a lubricant mounted on said support, there being a duct in said support lead-

ing from said reservoir to said die channels, means wherewith to feed a bullet to said die, means carried by said support to perform the sizing operation on said bullet and place its
5 grooves in juxtaposition with said channels for greasing, and means mounted on said support and actuated by the parts which perform the sizing operation to exert pressure on said lubricant to cause it to flow thru said die channels into the grooves of the bullet.

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