UNITED STATES PATENT OFFICE

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BULLET CLAMPING DEVICE

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3 Claims. (Cl. 279—53)

This invention relates to cartridge reworking devices and more particularly to a gripping tool for use in the removal of bullets from their shells. There are many instances where sportsmen desire to increase or otherwise change the power and effect of a cartridge of a particular caliber. This is readily accomplished by changing either the type of powder charge in a cartridge or by varying the amount of a powder charge. Cartridges are reworked to provide greater velocity and accuracy, as an economy measure, or to change the characteristics of a particular cartridge so that it may safely be used in a different type rifle or pistol than that for which it was originally manufactured. Cartridges are available at economy prices when bought in large quantities from such sources as the surplus stocks of the Government. Such cartridges are usually not satisfactory to the purposes of a sportsman because of their being charged for military use. However, these cartridges when reworked and the powder charge changed can be made acceptable. By recharging cartridges so purchased the sportsman effects a considerable economy.

It is therefore an object of the present invention to provide a gripping device or holder for use in removing bullets from shells. Another object of the present invention is to provide an improved form of bullet pulling tool adapted to be used with cartridges of a variety of calibers.

Another object of the present invention is to provide an improved form of cartridge reworking device having a minimum of parts and which is economical to construct and efficient in operation.

Other objects and features of this invention will be readily apparent to those skilled in the art from the following specification and appended drawings illustrating certain preferred embodiments in which:

Figure 1 is a view in perspective of a bullet pulling tool according to the present invention with the support therefor shown in phantom; Figure 2 is an exploded view of one form of the present invention with certain parts broken away for clarity; Figure 3 is a sectional view taken along line III—III of Figure 2; Figure 4 is an exploded view of a modification of the invention, with certain parts broken away for clarity; Figure 5 is a sectional view taken along line V—V of Figure 4. With reference to the embodiment of the invention shown in Figures 1, 2 and 3 the invention comprises a main body portion 1 consisting of a tubular casing or elongated cylinder provided with an enlarged cylindrical portion 2 at one end which is knurled for ease in effecting movement of the body portion 1. The exterior surface of the main body portion 1 below the enlarged portion 2 is threaded as indicated at 3. A hexagonal nut 4 is carried by the threaded surface 3. Extending axially through the elongated cylinder 1 is a continuous bore or passage 5 of a substantially constant diameter for the greater portion of its length and for the remainder of its length having the defining walls thereof tapered or inclined inwardly toward the longitudinal axis of body 1 as indicated at 6, and with the tapered portion terminating at the lower opening 7 to passage 5. The passage 5 is interiorly threaded, as at 8, the threads extending from upper end 11 of the body portion 1 to a point substantially near the center thereof.

Adapted to be received within bore 5 is a collet or gripping element 12. The collet 12 comprises a substantially cylindrical body 13 having an enlarged cylindrical portion 14 at one end, and a tapered or frusto-conical portion 15 provided at the opposite end. The cylindrical body 13 is provided with a plurality of longitudinal slits 16 (as particularly shown in Figures 2 and 3) which extend from the lower end 17 thereof substantially to the enlarged cylindrical portion 14; and thereby form resilient finger-like portions or prongs 18 which are movable toward and away from each other and the longitudinal axis of the body 13.

A force applying element is shown at 21 and comprises a substantially cylindrical externally threaded body 22 having an enlarged cylindrical portion 23 provided at one end. A handle 25 is carried by the enlarged cylindrical portion 23 fitting into an opening 26 provided therein through and being held within said opening by means of a set screw 27. In assembling the parts herein described the collet 12 is adapted to be received within bore 5 through the upper end of body portion 1 and rest at the lower end thereof with the frusto-conical portion 15 of collet 12 bearing upon or nesting in the tapered section 6 of bore 5. The threaded cylindrical body 22 of member 21 is adapted to cooperate with the threaded portion 8 of bore 5 whereby it can be moved longitudinally into and out of bore 5 on rotational movement of member 21 by handle 25. Movement of the cylindrical body 22 into the bore 5 will bring its lower end into engagement with the...
After engagement has been effected continued rotative movement of member 21 will apply pressure upon collet 12 to move this member toward lower opening 7 of bore 5 and force the frusto-conical portion 15 of collet 12 further into tapered section 6 of bore 5 whereby the resilient finger-like portions 18 will be moved toward line and axial surface.

The construction hereinafter described is adapted to be used in conjunction with a support and pulling means 31 which is adapted to rest upon a work surface 32. This means comprises a substantially semi-circular portion 33 having the end of rod 42 at its lower end and the cylindrical threaded bore which is adapted to receive the exteriorly threaded main body portion 1. A flange 35 extends from the semi-circular portion 36 and rests upon the work surface and is affixed thereto in any well known manner to hold means 31 rigid. Formed integrally with the semi-circular portion 36 is a substantially cylindrical body 37 having a bore or passage 38 extending the length thereof. The front of the cylindrical body 37 is cut away at 41 whereby communication is had from the exterior to the interior which extends through body 37. A rod-like member 43 is provided within bore 38 and is movably therein. The upper end 43 of rod 42 is adapted to accept and hold the end of a cartridge 44. A flat elongated member 45 is pivotally secured to the lower end of rod 42 at its lower end and the cylindrical body 37 through opening 41 to the exterior thereof. The exteriorly disposed end 46 of member 45 is pivotally attached to a member 47 which itself is pivotally mounted on a pin 48 carried at the lower end of the cylindrical body 37. A handle member 51 is provided on the pivotal member 47 whereby said member 47 can be rotated about its mounting on pin 48. Pivotal movement of member 47 by handle 51 will effect longitudinal movement of the rod-like member 42 upwardly and downwardly within the bore 38 of the cylindrical body 37 by reason of its connection therewith through the linking elongated member 45.

The operation of the invention the main body portion 1 is threaded into the arm 34 of support 31, the amount being determined by the size of the cartridge which is to be reworked. Upon determination of this amount the nut 4 is moved upon the surface 3 of body 1 until it bears against arm 34 and thereby locks the body 1 in position and prevents it from rotating within arm 34. As shown in Figure 1, a cartridge 44 is in position ready to be reworked, that is, ready to have the bullet 52 removed from its shell or casing 53. To position the bullet 52 within the holding tool of the present invention the handle 51 is rotated in a counterclockwise direction to effect an upward movement of rod 42 thereby carrying the cartridge 44 upwardly until that portion of the bullet 52 and its casing rests wholly within the collet 12 and between the prongs 18 thereof, which prongs 18 are then adapted to firmly grip or hold the bullet. The force applied by the prongs 18 is derived from the downward longitudinal movement of the collet 12 to carry the frusto-conical portion 15 thereof into tapered section 6 of bore 5 under pressure provided by member 21, which is moved into body portion 1 upon rotation of handle 25. This movement of the frusto-conical portion 15 into tapered section 6 causes the resilient prongs 18 to move inwardly toward one another to apply a firm clamping pressure on bullet 52. With the bullet 52 clamped the handle 51 is manually moved in a clockwise direction to actuate rod 42 downwardly, rod 42 being secured to cartridge 44 will apply a pulling force thereon and will cause it to separate from the bullet 52. It is possible that under the pulling force provided by rod 42 a movement of collet 12 might be effected. This movement is not detrimental to the operation of the invention for it is readily seen that if collet 12 is actuated downwardly its frusto-conical portion 15 will be wedged further into tapered section 6 to push the prongs 18 still harder against the outer surface of the bullet positioned therebetween thus even more effectively clamping and holding the bullet in position. When the casing separated from the bullet the powder charge may be changed in the casing as desired. The bullet may then be rescored, by means not shown, to its casing, and a cartridge of the power desired is then had.

It is here pointed out that the specific form of support for carrying the main body portion 1 and the mechanism 31 for providing a pulling force to the casing 53 to effect its separation from the bullet 52 forms a part of this invention. Any construction that would provide a support and the pulling action could be utilized. The specific construction herein described is one form that may be used.

As hereinbefore stated the present invention is adapted to the pulling of bullet 52 to a variety of calibers. A difference in caliber however requires the use of a differently proportioned collet. These collets will resemble collet 12 and differ thereover only in the amount of opening provided between prongs 18. A calibered bullet requires a larger opening than does a smaller calibered bullet to permit the passage thereof between the prongs 18. A small calibered bullet will be accepted by a collet designed to receive a bullet of larger caliber but the clamping force that can be applied by the prongs 18 may not be sufficient in all cases to retain the bullet therewith when a pulling force is exerted by the rod 42. Thus the invention works best when bullets are used only with collets designed to receive the particular caliber of the bullet which is to be pulled. As is well known, the lengths of casings of cartridges vary. To care for differences in length the main body portion 1 has been threaded over a considerable portion of its outer surface so that it can be readily adjusted a substantial distance toward and away from the top of movable rod 42. By trial the amount that body portion 1 must be threaded into its support for a particular length of casing is readily determined and the nut 4 is actuated to lock the body portion 1 in position and a series of cartridges having this length of casing can then be worked.

Figures 4 and 5 illustrate a second embodiment of the invention. This embodiment comprises three principal elements as does the embodiment above described: a main body portion 51, a collet 62 and a force applying member 63 but the design of these elements is somewhat different.

Main body portion 61 comprises a substantially cylindrical externally threaded body 58 having a knurled enlarged cylindrical portion 65 at one end. A nut 65 is carried by body 64. A bore 67 passes through the length of body 61. The defining walls of the bore 67 at the lower end thereof are flared or inclined outwardly away from the longitudinal axis of body 61 as indicated at 68,
Bore 67 further differs from bore 5 of above described body portion 1 in that no threads are provided therein. A projection or pin 68 however extends into bore 67 for a purpose to be described.

As shown, collet 62 comprises a substantially cylindrical body 71 with the lower portion thereof gradually enlarged in diameter as shown at 72 to provide a flared skirt-like portion. At the opposite end of the cylindrical body 71 a key-way 73 is provided. A bore or passage 74 extends through collet 62 and 61 is threaded from the upper end thereof substantially for half its length, as shown at 76. At the lower end of bore 74 there is provided a knife-edge circular flange 78 which extends inwardly toward the center of bore 74. A plurality of slots 76 provided in the cylindrical body 78 divides it into a plurality of resilient prongs or fingers 77 which are adapted to move toward and away from one another.

The force applying member 63 comprises a substantially cylindrical externally threaded body 80 having an enlarged cylindrical portion 76 at one end which carries a handle 81. The lowermost portion of the enlarged cylindrical portion 76 is of generally frusto-conical shape as indicated at 82. The bore 61 in main body portion 61 tapers at its upper end to provide a seat 64 which accepts portion 52 to limit the travel of the body 75 into the bore 71.

In the assembly of the elements above described the collet 62 is inserted through the bottom end of the main body portion 1 into passage 61 and moved inwardly and adjusted therein to locate the key-way 73 over the pin 69 to prevent collet 52 from rotating. The member 63 is then inserted into the bore 74 through the top thereof and upon rotation thereof by handle 81 the externally threaded portion 76 thereof is threaded into the collet 62 drawing the collet 62 longitudinally upwardly to bring the flared portion 72 into engagement with the inclined walls 86. Continued movement of the collet 62 into passage 74 under the actuation of member 63 wedges portion 72 against inclined walls 86 to cause prongs 77 to move toward one another.

In operation this second embodiment of the invention works substantially in the same manner as the first embodiment herein described. With the holder positioned in its support a bullet is inserted as indicated at 52 between the collet 62. With the wedging of the flared portion 72 of the collet 62 against the inclined walls 86 of bore 67 the prongs 77 will move against the outer surface of the bullet forcing the knife edge 16 into the body thereby firmly clamping the bullet. The rod 42 may then be moved by handle 51 to apply a pulling force to the casing of the cartridge to be reworked to separate it from the bullet to permit the powder charge therein to be changed.

While certain preferred embodiments of the invention have been specifically disclosed it is understood that the invention is not limited thereto as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims.

I claim:

1. In a tool of the class described adapted for use in the removal of a bullet from its casing, a housing having an opening at its upper and its lower end, a substantially cylindrical bullet-holding member having a passage extending there through and movable through the lower end of said housing to extend therein, clamping means provided on said bullet-holding member, a rotatable actuating means movable through the upper end of said housing and having a threaded connection with said bullet-holding member and adapted to effect axial movement of said bullet-holding member within said passage to actuate said clamping means, and means to prevent rotative movement of said bullet-holding member.

2. In a device of the character described for use in the removal of a bullet from its casing, a housing having a passage extending the length thereof and opening through the upper and lower ends of the housing to the exterior thereof, and with the interior wall portions defining one end of said passage being inclined with respect to the axis of said housing, an axially movable substantially cylindrical bullet-clamping member insertable through the lower end of the housing to lie disposed within said passage and having a plurality of depending finger-like elements, with the ends of said finger-like elements being flared outwardly, said bullet-clamping member having a bore therethrough, the upper end of said bore being provided with internal threading, a rotatable substantially cylindrical actuating means having an externally threaded portion movable through the upper end of the housing and adapted to engage with the internal threading in said bore whereby longitudinal movement of said bullet-clamping member can be had upon rotative movement of said actuating means to bring said flared ends of said finger-like elements into engagement with said inclined wall portions, and means, comprising a pin and keyway, provided by said housing and bullet-clamping member to prevent rotative movement of said bullet-clamping member.

3. In a device of the character described for use in the removal of a bullet from its casing, an externally threaded cylindrical housing having a bore extending the length thereof and opening to the exterior thereof, and with the interior wall portions defining the lower end of said passage extending outwardly inclined with respect to the axis of said housing, an axially movable substantially cylindrical bullet-clamping member movable into said housing passage through the lower end thereof, said bullet-clamping member having a plurality of depending prongs 17, with the ends of said finger-like elements being flared outwardly, an inwardly directed knife-edge flange provided at the ends of said finger-like elements, said bullet-clamping member having a bore therethrough, the upper end of said bore being provided with internal threading, a rotatable substantially cylindrical actuating means having an externally threaded portion movable through the upper end of said housing and adapted to engage with the internal threading in said bore whereby movement of said bullet-clamping member can be had upon rotative movement of said actuating means to bring said flared ends of said finger-like elements into engagement with said inclined wall portions, and means, comprising a pin and keyway, provided by said housing and bullet-clamping member to limit the movement thereof to a longitudinal movement.

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