

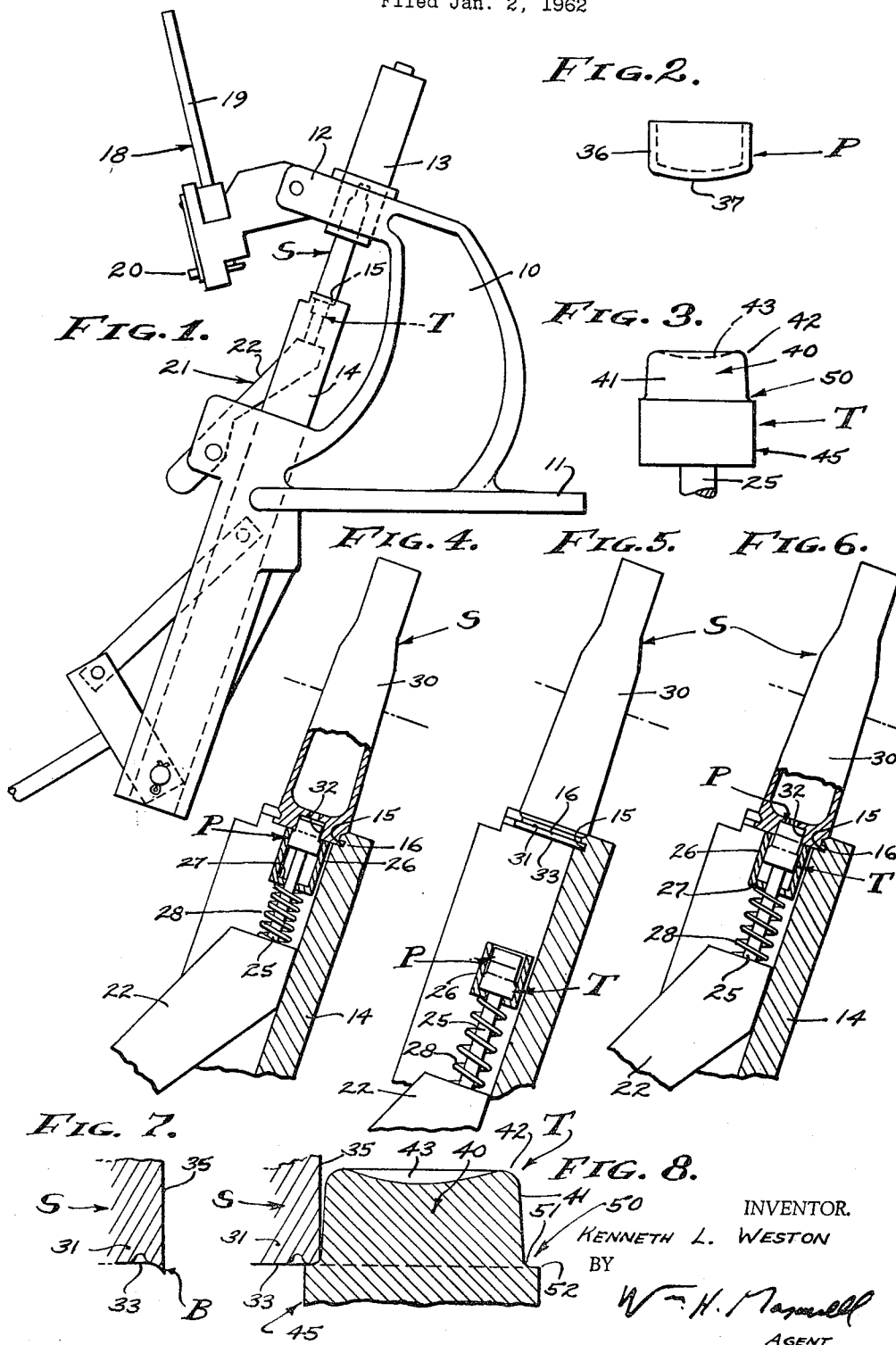
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PRIMER POCKET TOOL FOR RELOADING CARTRIDGE CASES

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PRIMER POCKET TOOL FOR RELOADING
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1 Claim. (Cl. 86—36)

This invention relates to ammunition and a combination primer pocket swaging and primer seating tool for the reloading of used cartridge cases, involving the process steps of resizing, decapping, deburring, recapping, reloading per se, and projectile seating. A general object of this invention is to provide a tool for use in the reloading of cartridges and through which the reloading process as a whole is expedited.

There is a particular source of ammunition available to those who are interested in reloading used cartridges, namely used United States Government rifle cases. These government cases or "brass" differ from the commercial ammunition in that the primers are initially crimped or staked in the pockets of the cases and which involves sharp corners at the edges of said pockets, as distinguished from rounded corners in the commercial equivalent. In any case, the government cases are readily available and are in demand because of superior construction. However, these superior government cases require reworking of the sharp corners of the primer pockets and it is this feature of these cartridge cases with which the present invention is primarily concerned.

Referring now to the particular kind of ammunition that is to be reworked and reloaded, it is usual practice to deburr the said sharp edge of the primer pocket by reaming the same with a hand operated reamer. This practice requires, removal of the cartridge case from the reloading apparatus, the separate operation of reaming in order to remove the burr, and the reinsertion of the cartridge case into the reloading apparatus for charging the same with powder and for seating the projectile. In other words, with ordinary apparatus and with available tools it is not possible to deburr the primer pocket while the cartridge case is held in the reloading apparatus. On the contrary, time consuming removal of the cartridge cases from the apparatus is required in order to deburr the primer pocket.

An object of this invention is to provide a tool for use in ammunition reloading apparatus whereby deburring of the primer pocket is conducted without removal of the cartridge case at any time. With the tool hereinafter disclosed it is possible to conduct the reloading process with continuity and with a substantial reduction in time and effort. Specifically, about one-half of the usual manual operations or motions are eliminated and with a consequent reduction in time and effort.

It is an object of this invention to provide a combination tool for use in ammunition reloading apparatus and which successfully performs the functions of swaging (to be distinguished from reaming) and pressing. Note is to be made that these two functions are accomplished without sacrificing the guiding characteristics which must be maintained in connection with this tool, to properly align the new primer that is to be installed.

It is still another object of this invention to provide a tool of the character referred to that is safe to operate without danger of exploding the new primer to be installed, and a tool that is devoid of intricacy and all to

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the end that a very inexpensive and very practical improvement is provided which can be incorporated in existing apparatus without alteration thereof. The only change in said apparatus will be the substitution of the instant tool in place of the tool presently used to press primers into the primer pockets.

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred form and application thereof, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a side elevational view of an ammunition reloading apparatus of the type in which the tool of the present invention can be used.

FIG. 2 is an enlarged view of a typical primer.

FIG. 3 is an enlarged view of a preferred embodiment of the present invention.

FIGS. 4, 5 and 6 are separate views showing the process steps involved in using the tool of FIG. 3 as it is installed in the apparatus in FIG. 1.

FIGS. 7 and 8 are enlarged detailed sectional views showing the reformation of the burred edge of the primer pocket, FIG. 7 showing the burr that is to be removed and FIG. 8 showing the tool in the process of eliminating said burr.

In FIG. 1 of the drawings I have shown a much used type of ammunition reloading apparatus. The apparatus comprises a C-shaped frame 10 having a horizontal flange 11 for securement to a table top or the like. The upper leg 12 of the frame 10 is provided with any of a number of different dies 13 adapted to resize the particular cartridge case to be reloaded. The axis of the die 13 is on the operative axis of the apparatus and said axis is preferably inclined, as shown. The lower portion of the frame 10 carries a reciprocable member 14 and a manually operable linkage to shift said member relative to the die 13. Said member 14 has a cartridge case receiving means at its uppermost end, typically in the form of a side opening recess 15 adapted to receive the case laterally and to engage the rim 16 of the case. Thus, the member 14 is coupled to the cartridge case to move it in a positive manner.

With the apparatus generally described above, the various steps of resizing, decapping, deburring, recapping, reloading with a powder charge, and projectile seating can be carried out, and said deburring is made possible in the apparatus by the provision of the tool herein disclosed. In accordance with usual construction, the apparatus includes a decapping pin (not shown) that projects through the die 13, and it may include dispensing means for new primers and for the new powder charges. Since this invention is not concerned with the powder charges nor with the projectile seating a discussion of the same will be dispensed with, it being understood that said two steps will follow in the usual manner after the new primer is installed.

The apparatus, as shown, includes dispenser means 18 having a supply tube 19 for containing a supply column of new primers P and with a transversely shiftable stop pin 20 adapted to release one primer P at a time. The means 18 is positioned at the top front portion of the apparatus and a transfer means 21 is provided to receive a primer P at means 18 and to position it for alignment with and pressing into the primer pocket of the case S. As shown, the means 21 involves an arm 22 that is piv-

otally mounted on the frame 10 to swing from the means 18 to a position where the new primer P is aligned with the operational axis of the apparatus. As is usual practice, the means 21 comprises a shaft 25 that supports the swaging and pressing tool later described and which slidably carries a primer positioning sleeve 26. The sleeve 26 is cup-shaped with a transverse bottom 27 having a bore therethrough to slidably pass the shaft 25. A compression spring 28 surrounds the shaft and acts between the arm 22 and sleeve 26 to yieldingly urge the sleeve in an upward direction, and to permit said sleeve to be depressed downwardly. The said sleeve 26 is retained on the shaft 25 by the tool of the present invention that forms a head of larger diameter than the shaft 25.

The cartridge case S that is to be reformed by the apparatus for reloading has a cylindrical wall 30 and a base 31 with a primer pocket 32 opening at the butt end 33 of the case. A passage communicates the interior of the case with the pocket 32, the said pocket being round with a cylindrical wall 35 concentric with the axis of the case. In the original cartridge case under consideration the corner at the wall 35 and end 33 is sharp, at a right angle, and the material thereof is rolled over or staked over the originally installed primer P.

The primer P is an inverted cup-shaped element containing a cap material and an anvil. The said element has a cylindrical outer wall 36 to have a light press fit with the wall 35 of the primer pocket, and has a bottom wall 37 of disc shape continuing from the wall 36. In some instances, the wall 37 is absolutely flat and in other instances the wall 37 is arcuately crowned as shown. In any case, the wall 37 is adapted to be indented by a hammer blow in order to strike the cap material against the anvil, whereby the primer explodes to fire the powder charge in the case S.

When the original primer P is removed by the de-capping pin, the crimped edge at 33-35 is straightened as shown in FIG. 7 to project and form a flashing or burr B. As a result, the sharp and right angle edge is emphasized by any spring back of the material forming the case and it is made somewhat acute. In any case, it is necessary to remove said sharpness, flashing or burr B. In FIG. 3 of the drawings is shown the combination primer pocket swaging and seating tool T of the present invention. As shown, the tool T is a single element of construction in the form of a head at the upper end of the shaft 25. In accordance with the invention the tool T comprises a pilot portion 40, a centering portion 45, and a swaging portion 50. The portions 40, 45 and 50 are integrally incorporated in the tool to guide the tool, to swage and remove the burr B, to position the sleeve 26 that carries a primer P and to press the primer P into an installed position.

The pilot portion 40 has an outer cone-shaped wall 41 sized to just axially fit into the primer pocket. The portion 40 fits the diameter of the primer pocket with little if any clearance at its base, and it tapers, for example, from .210 inch to .190 inch. This give a guiding action that brings the swaging portion 50 into proper play. The pressing function of the tool is accomplished by the terminal end of the tool which is formed with a convexly radiused periphery 42 and with a concaved face 43. Said face 43 is concaved so as to clear the convex shape of the primer P and whereby the pressing pressures are applied at the peripheral wall of said primer, thereby avoiding danger of accidentally indenting said wall to set off the cap material.

The centering portion 45 is slightly larger in diameter than the base of the pilot portion 40 and will not enter the primer pocket, and in practice is, for example, five to ten thousandths of an inch greater in diameter than the pilot portion. In carrying out the invention the sleeve 26 is but slightly greater in diameter than the centering portion 45, so as to be free to slide thereon, and

in this way the inner diameter of the sleeve freely receives the primer P and centers it within the above-mentioned five to ten thousandths of an inch limits.

The swaging portion 50 is intermediate the pilot portion 40 and centering portion 45 and it is basically a tapered portion forming the transition between the two diameters involved, namely, the diameter at the base of the pilot portion and the diameter of the guiding portion, respectively. In the preferred form, the swaging portion comprises a concave fillet 51 at the portion 40, and the corner at 52 can be and is preferably sharp. The fillet 51 can be such as to eliminate any straight portion at the corner 52 and acts to swage the corner 33-35 outwardly and downwardly. It is to be understood, however, that the transition between the two portions 40 and 45 be a simple, conical taper and adapted to have a swaging action.

The tool T hereinabove described is used as follows: the tool T is a multi-purpose instrument that can be used to best advantage by installing it in an apparatus for mechanized processing of ammunition. In any case, the tool T is aligned with the axis of the case to be processed, to be centered with the axis of the primer pocket. Assuming that the reloading process has reached the stage where the old expended primer P has been pressed out of place from the primer pocket, then there will be a burr B that must be removed. The tool T is now put into use by swinging it into alignment with the operative axis, above described, and by driving it forwardly relative to the case in order to enter the pilot portion into the empty primer pocket. Firstly, the tapered pilot portion 40 enters the primer pocket with a close fit, and secondly, the swaging portion 50 engages with the burr B to press the same radially outward and inward. In practice, the fillet 51 can be a 90° fillet, in which case it effectively forms a stop shoulder tangent to the plane of the butt end 33 of the cartridge case. Thus, it becomes apparent that the tool T compresses the burr B, the cartridge case being of relatively soft material such as brass, and forms in place thereof an arcuately curved convex radius at the corner 33-35.

Having rounded the corner 33-35 as above described, the tool T is retracted relative to the case. During the swaging operation the sleeve 26 was depressed and upon retraction of the tool T from the swaging position the spring 28 repositions the sleeve 26, so that it projects well beyond the concaved end of the pilot portion 40. Thus, a cup-shaped recess is provided to freely receive a new primer P that is to be pressed into the prepared primer pocket. Again, the tool T is driven forwardly relative to the case in alignment with the operative axis, whereupon the new primer P is pressed into the installed position. The periphery of the new primer P is slightly radiused and with the rounded corner of the newly prepared primer pocket it is a simple matter to enter the new primer P into the installed position. Further, during the latter pressing operation the concavity of the face 43 assures that no pressure is applied to the sensitive center portion of the primer P, which in many instances is somewhat convex.

By using the tool T herein disclosed, resizing, removal of old expended primers, swaging of burrs from the primer pocket, and seating of new primers is all accomplished without removal of the cartridge cases from the reloading apparatus, thereby saving a great deal of time and effort.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art and fall within the scope of the following claim.

Having described my invention, I claim:

A multi-purpose tool for deburring primer pockets and for pressing primers into said pockets in the reprocessing of used cartridge cases in a reloading apparatus having

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a shaft for supporting the said tool on the operative axis of the apparatus, by deburring the primer pockets of said cases, and including:

- (a) an enlarged head carried on said shaft and having a pilot portion, a guide portion and an intermediate swaging portion, 5
- (b) said pilot portion being of a diameter to closely fit into the diameter of the primer pocket,
- (c) said guide portion being of larger diameter than the pilot portion, 10
- (d) said swaging portion being tapered outwardly from the pilot portion to the guide portion to form the primer pocket radially outwardly,

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- (e) and a sleeve carried on the shaft and biased into engagement with the head and normally extending above and surrounding the head to center a primer to be pressed into the primer pocket by the head.

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