

April 10, 1956

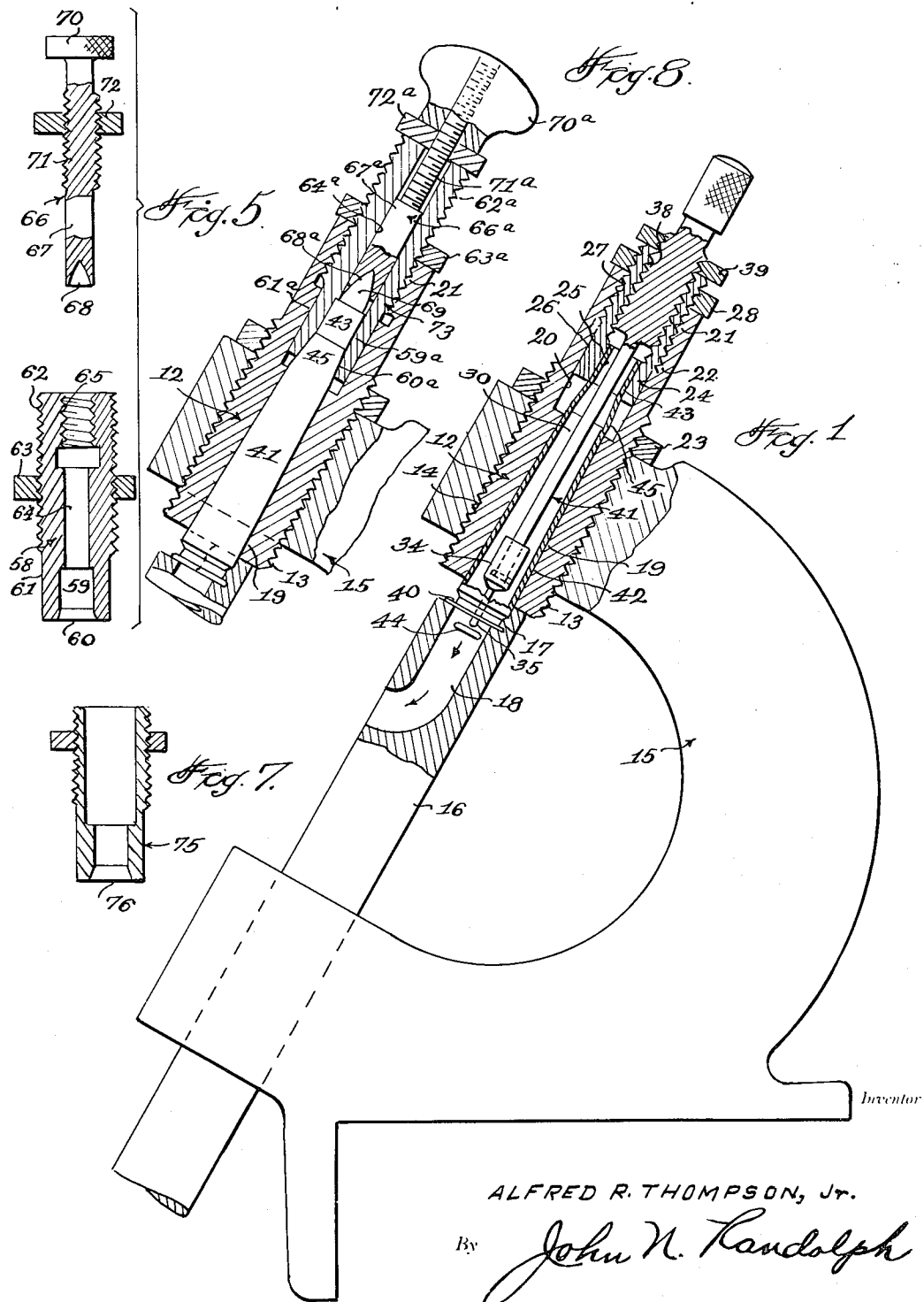
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LOADING DIE FOR SMALL ARMS AMMUNITION

Filed Dec. 8, 1950

2 Sheets-Sheet 1



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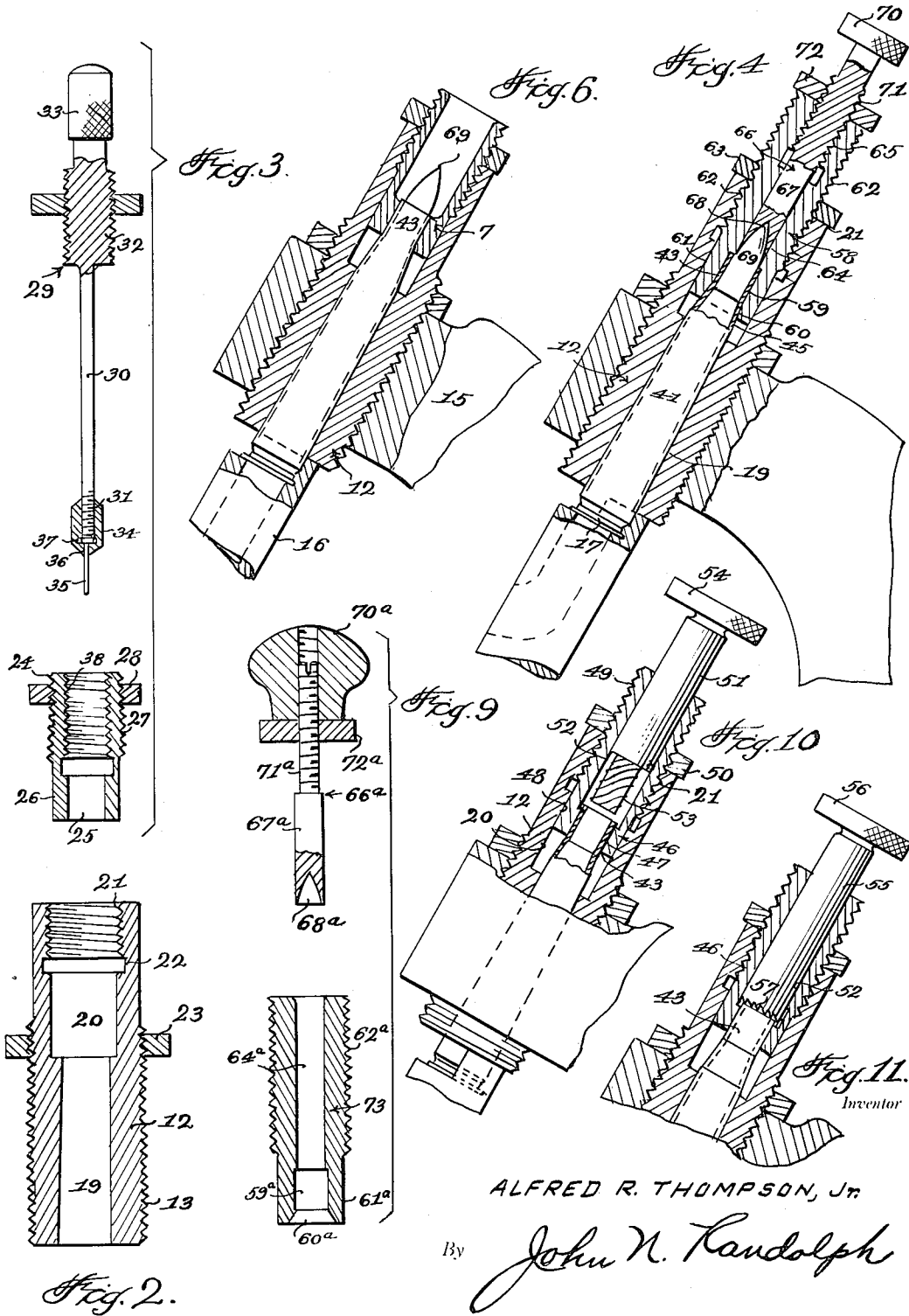
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LOADING DIE FOR SMALL ARMS AMMUNITION

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2 Claims. (Cl. 86—23)

This invention relates to a novel construction of die for loading or reloading small arms ammunition which is adapted to be mounted in a conventional loading press frame to function therewith for loading or reloading cartridge cases and which will also function to reshape and re-size the cartridge case, to remove the fired primer and apply the new bullet or projectile.

Another object of the invention is to provide a reloading die capable of being used with cartridge cases of different calibers but having the same body taper, by means of interchangeable and adjustable die insert parts.

Still a further object of the invention is to provide a die insert including a master element for mounting in an existing loading press frame and which will insure a correct alignment of the various interchangeable die inserts which are detachably and adjustably connected to said master element for accomplishing all the operations necessary in re-sizing, reshaping and reloading of a cartridge case.

It is at the present time common practice to use a cartridge case of a given caliber, the neck of which is either expanded or reduced to hold a bullet or projectile of a different caliber or bore size. Accordingly, it is one object of the present invention to provide a re-sizing, reshaping and loading die which may be employed with cartridge cases of different lengths having the same body taper.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating a presently preferred embodiment thereof, and wherein:

Figure 1 is a longitudinal sectional view, partly in side elevation showing the invention mounted in a conventional loading press frame and assembled for reshaping of the body taper of a cartridge case and for performing other initial operations preparatory to reloading the fired cartridge case;

Figure 2 is a longitudinal central sectional view of the master cylinder only;

Figure 3 is an exploded longitudinal sectional view, partly in side elevation of certain of the inserts employed with the master cylinder;

Figure 4 is a view similar to Figure 1 showing the parts assembled for loading or reloading a cartridge case;

Figure 5 is an exploded longitudinal sectional view, partly in side elevation of the reloading or loading insert;

Figure 6 is a view similar to Figure 4 showing the parts assembled for swaging a cartridge case neck;

Figure 7 is a longitudinal sectional view of an insert for swaging and reshaping a cartridge case neck and shoulder;

Figure 8 is a view similar to Figure 4 showing another form of loading or reloading insert;

Figure 9 is an exploded longitudinal sectional view, partly in side elevation of the reloading insert of Figure 8;

Figure 10 is a view similar to Figure 6 showing the

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neck swaging insert employed with an inside neck reamer, and

Figure 11 is a view similar to Figure 10 showing the neck swaging insert employed with an end reamer or trimmer.

Referring more specifically to the drawings, the reloading, reshaping and sizing unit in its entirety includes an elongated master cylinder, designated generally 12, the body of which is externally threaded as seen at 13 from one end to adjacent or near the other end thereof to threadedly engage a threaded opening 14 in one end of the frame 15 of a conventional loading press, which frame has a bore spaced from its threaded opening 14 and disposed coaxially therewith to reciprocally receive a ram or plunger 16 which may be reciprocally moved toward and away from the frame opening 14 by a lever or any other suitable means, not shown. The upper end of the ram 16 is shown provided with the usual cartridge head receiving seat 17. The upper portion of the ram 16 is provided with a bore 18 which opens into the seat 17 at its upper end and radially outwardly of the ram at its lower end.

The master cylinder 12 has a bore 19 extending inwardly from the end thereof, located adjacent the ram 16 and which is inwardly tapered uniformly from end-to-end thereof. The inner, restricted end of the bore 19, which is located substantially intermediate of the ends of the master cylinder 12 opens into a cavity 20 of larger diameter than the inner end of the bore 19. The master cylinder 12 is provided with an internally threaded bore portion 21 which opens outwardly of its opposite end and which communicates with the cavity 20. The portions 20 and 21 are coaxially arranged relatively to one another and to the tapered bore 19 and are each concentric with the axis of the master cylinder 12 and its externally threaded portion 14. The threaded portion 21 is slightly larger in diameter than the cavity 20 and an annular reamed out portion 22 may be provided between the threaded portion 21 and cavity 20. The threaded end 13 of the master cylinder 12 is threaded through the threaded opening 14 in a direction inwardly of the frame so that the enlarged end of the bore 19 is disposed adjacent the ram 16. A jam nut 23 is adjustably mounted on the threaded portion 13 and bears against the outer side of the frame 15 to adjustably position the enlarged end of the tapered bore 19 relatively to the ram 16.

An elongated cylindrical insert 24 for re-sizing a cartridge case neck is provided with an end portion having a bore 25 of circular cross section and uniform diameter and a peripheral portion 26 which is likewise of circular cross section and uniform diameter and concentrically disposed relatively to the bore 25. The periphery 26 snugly engages in the cavity 20 so that the bore 25 is disposed coaxial relatively to the master cylinder 12. The opposite, outer end of the insert 24 is externally enlarged and externally threaded as seen at 27 to threadedly fit the threaded portion 21. The bore 25 is adjustably disposed with respect to the cavity 20 by a jam nut 28 which engages the threaded portion 27, outwardly of the master cylinder 12 and which abuts against the outer or upper end of said master cylinder. A de-capping pin and neck expander unit, designated generally 29, as best illustrated in Figure 3 includes a rod 30 having an externally threaded end 31. The rod 30 at its opposite end is substantially enlarged to provide an externally threaded body portion 32 having an extension forming a knurled knob 33. An internally threaded socket 34 is detachably connected to the threaded rod end 31 and supports a pin 35 the shank of which extends through a restricted opening 36 in the outer end of the socket 34. The pin 35 has a head 37 disposed within the socket 34 which is too large to pass through the opening 36 and which is held against the

bed of the socket by the threaded rod end 31, so that the pin 35 forms a straight extension of the rod 30. The rod 30 with the pin 35 as its leading end is inserted longitudinally through the die insert 24 and through the master cylinder 12 so that the pin 35 projects beyond the enlarged end of the bore 19. The enlarged threaded portion 32 threadedly engages the internally threaded outer end portion 38 of the insert 24 which is of larger diameter than the bore 25 and which is concentrically disposed relatively thereto, so that the rod 30 is thus supported axially of the master cylinder 12. Said threaded portion 32 also carries a jam nut 39 which abuts against the outer end of the insert 24 to adjustably position the pin 35 relatively to the enlarged end of the bore 19.

Assuming that the parts as disclosed in Figure 1 are to be utilized for preparing fired cartridge cases for reloading, the head 40 of such a cartridge case 41 is engaged in the seat 17 so that the cartridge case will extend upwardly from the ram 16. It will be understood that the ram 16 is retracted away from the master cylinder 12 when the case 41 is applied thereto. The ram 16 is then displaced upwardly by its actuating means to a fully projected position and in so moving the case 41 is projected upwardly into the master cylinder 12. The master cylinder 12 is so adjusted in the frame opening 14 by its threaded portion 13 and jam nut 23 that when the ram 16 is in a fully projected position the tapered body portion 42 of the case 41 will be snugly engaged in the tapered bore 19 and will have been reshaped thereby. Likewise, as the case 41 enters the cylinder 12 the case neck 43 will pass around the socket 34 the periphery of which is shaped and sized to reshape the bore of the neck 43, the outer end of which socket is tapered: to guide the neck onto said socket 34. As the case 41 approaches its fully projected position of Figure 1, the pin 35 will engage the fired primer 44 and eject it from the case head 40 into the passage 18 from which it will be discharged by gravity, so that a new primer may be subsequently applied to the case head 40. Thus, the jam nut 39 properly positions the pin 35 and socket 34 relatively to the case head 40 when the case is in a fully applied position. At the same time that the fired primer is being ejected, the case neck 43 is entering the insert bore 25 in which it is snugly received for reshaping the exterior of the neck 43. It will be readily apparent with the parts as illustrated in Figure 1 assembled with the frame 15, any desired number of cartridge cases 41 may be repaired as previously described for reloading without adjusting the rod 30 relatively to the insert 24 or the insert 24 relatively to the master cylinder 12. It will also be apparent that cartridge cases having the same body taper but of different caliber or length may be thus processed by adjusting the master cylinder in the frame opening 14. It will also be noted that in the operation previously described and as illustrated in Figure 1, the cartridge shoulder 45 is not engaged by any of the parts.

If certain of the cartridge cases 41 require further reshaping or swaging of the neck 43, a neck swaging insert 46 may be positioned in the master cylinder 12 as illustrated in Figure 10, in lieu of the insert 24 and rod 30 and which insert 46 is provided with a neck swaging bore 47 at its inner end which is supported coaxially of the cylinder 12 by the surrounding peripheral portion 48 which snugly fits the cavity 20. The opposite end of the insert 46 is externally threaded as seen at 49 to engage the threaded cylinder portion 21 and carries a jam nut 50 to adjustably position the swaging bore 47 relatively to the cavity 2. If the cartridge neck 43 additionally requires reaming, a reaming implement shank 51 may be slidably mounted and journaled in the enlarged bore 52 of the insert 46 which extends from the outer end thereof to the swaging bore 47. The reaming tool shank 51 is provided with a restricted reaming bit 53 at its inner end which is sized to fit into and ream the case neck 43. The reaming

tool 51 is revolved by a knurled knob 54 formed on the outer end of the shank 51.

If the outer end of the neck 43 requires trimming off or smoothing, an end reamer shank 55, having a knob 56 at its outer end may be slidably inserted into the bore 52 of the neck reamer insert 46 in which it is journaled so that the bit portion 57 formed on the end of the shank 55 will trim or smooth off the end of the case neck 43 when the reamer shank 55 is revolved in the bore 52.

After any desired number of cases 41 have been prepared for reloading, as previously described, a reloading insert of elongated cylindrical shape as seen in Figures 4 and 5 and designated generally 58, is inserted into the outer end of the master cylinder 12, as seen in Figure 4, from its outer internally threaded end. The reloading insert 58 has a neck receiving bore portion 59 adjacent its inner end which terminates in a flared shoulder receiving and reshaping portion 60. The periphery of the insert 58, disposed around the bore portions 59 and 60 is circular in cross section, as seen at 61 to snugly fit the master cylinder cavity 20 to center the bore portions 59 and 60 relatively thereto. The remainder of the insert 58 is externally threaded as seen at 62 to fit the threaded cylinder portion 21 and the insert 58 is adjustably mounted relatively to the tapered bore 19 by a jam nut 63, carried by the threaded portion 62 which abuts against the upper end of the cylinder 12. The reloading insert 58 has an intermediate bore portion 64 of smaller diameter than the bore portion 59 which is likewise disposed axially of the cylinder 12. The outer end of the insert 58 is provided with an internally threaded bore portion 65 of larger diameter than the bore portion 64.

A bullet seating stem 66 has a smooth leading end 67 sized to snugly fit the bore portion 64, which is provided with a recess 68 at its terminal to fit the ogive of a bullet or projectile 69 to be seated thereby. The stem 66 is provided with a turning knob 70 at its outer end and has an intermediate externally threaded stem portion 71 of larger diameter than the portion 67 that threadedly engages the bore portion 65 to adjustably position the stem seat 68 relatively to the insert 58. The stem 66 is retained in adjusted position by a jam nut 72 which is adjustably mounted on the threaded portion 71 and which abuts against the upper end of the insert 58. With the parts 58 and 66 properly adjusted with respect to one another and relatively to the master cylinder 12, a reshaped cartridge case 41 is again seated in the seat 17 and inserted into the master cylinder 12 through the enlarged bore end 19 by the ram 16 being projected upwardly. A bullet or projectile 69 is inserted into the bore 19 in advance of the cartridge case neck 43 and is guided by said bore and by the bore portions 60 and 59 as it is advanced ahead of the cartridge case 41 until its ogive seats in the recess 68. As this occurs, the cartridge case neck 43 will be entering the neck receiving bore 59 and will be forced over the trailing end of the projectile 69 so that said projectile will be completely seated in the neck 43 when the case 41 reaches its fully projected position of Figure 4. Likewise, in this position the shoulder 45 will be swaged or reshaped by the bore portion 60. It will be understood that the operation of reloading the cartridge case 41 with the bullet or projectile 69, as just previously described and as illustrated in Figure 4, will be accomplished after the new primer has been applied to the cartridge case head 40 and after a new charge of explosive has been applied to the case 41. It will also be apparent that any number of cartridge cases 41 may thus be reloaded without adjustment of the assembly as illustrated in Figure 4.

If desired, the cartridge cases 41 may be manually reloaded instead of being reloaded by projection of the ram 16 and this operation is accomplished by utilizing a slightly different shaped bullet reloading insert 73 having inner end portions 59a, 60a and 61a corresponding to the portions 59, 60 and 61, respectively. However, the

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shoulder swaging portion 60a may be elongated as illustrated in Figure 8 to engage a greater portion of the cartridge shoulder 45. The manual reloading insert 73 has an externally threaded end portion 62a corresponding to the portion 62 which adjustably engages the threaded bore 21 of the master cylinder 12 and is retained in adjusted position by the jam nut 63a. The insert 73 differs from the insert 58 in that its bore portion 64a, corresponding in cross section to the bore portion 64 extends from its outer end to the bore portion 59a. In lieu of the stem 66, a stem 66a is employed having an end 67a corresponding to the stem portion 67 having a snug sliding engagement in the bore portion 64a which has a cavity 68a in its inner end to receive the nose of the bullet 69. In lieu of the stem portion 71, the stem 66a is provided with a restricted threaded stem portion 71a which loosely fits the bore 64a and projects from the outer end thereof. A jam nut 72a is adjustably carried by the stem portion 71a to limit the extent that the cavity 68a can move inwardly of the bore 64a. A knob 70a is threadedly connected to the outer end of the stem portion 71a and is enlarged so that said knob may be manually engaged to project the stem 66a inwardly of the insert 73. Using the parts 73 and 66a, the cartridge case 41 is applied as previously described in reference to Figure 4 but without the bullet 69 in advance thereof and after the cartridge case is fully seated as illustrated in Figure 8, the bullet 69 is inserted flat end first through the outer end of the bore 64a and the stem portion 67a is inserted after the bullet as a ram or plunger for manually seating the bullet in the neck 43.

Figure 6 illustrates a neck swaging die 74 which may correspond to the die 46, shown employed with the master cylinder 12, for swaging or shaping the cartridge case neck 43 around the bullet 69 after the bullet has been previously applied to the cartridge case as illustrated in Figures 4 and 8.

Figure 7 illustrates another swaging insert 75 which differs from the swaging insert 74 or the swaging insert 46 only in that it is provided with a frusto-conical bore portion 76 at its inner end for swaging the cartridge shoulder 45 and which functions in the same manner and for the same purpose as the shoulder swaging bore portion 60 or 60a. The swaging insert 75 may likewise be utilized in the same manner as the insert 74, as seen in Figure 6, for simultaneously swaging the case neck 43 and shoulder 45 after the bullet 69 has been applied to the cartridge case 41.

Various modifications and changes are contemplated and may obviously be resorted to, without departing from the spirit or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. An attachment for use with an ammunition loading press frame having a threaded opening in one end of the press frame and a cartridge case supporting plunger reciprocally mounted in the frame for supporting and displacing a cartridge case toward and away from the frame opening, comprising a master cylinder having an

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externally threaded portion concentrically disposed relatively to the axis of the master cylinder threadedly engaging in the frame opening and having one end projecting therefrom toward the plunger, said master cylinder having a longitudinally extending bore extending inwardly thereof from said aforementioned end, said bore terminating intermediate of the ends of the master cylinder and being tapered uniformly from its outer to its inner end and being disposed axially of the master cylinder and of said plunger, the opposite end of the master cylinder having an enlarged internally threaded bore portion opening outwardly thereof, said master cylinder having an internal cavity of uniform diameter extending between said threaded bore portion and the inner end of the tapered bore and disposed axially of the master cylinder, said cavity being of a larger diameter than the adjacent end of the tapered bore and of a smaller diameter than the threaded bore portion, said tapered bore portion being adapted to snugly receive and reshape the tapered body of a cartridge case supported by the plunger and displaced into the master cylinder by projection of the plunger toward the master cylinder, said cavity being adapted to loosely accommodate the cartridge case shoulder and neck when the tapered body thereof is seated in said tapered bore; and a cartridge case engaging insert comprising an elongated sleeve-like member having an externally threaded end threadedly engaging in the threaded bore portion of the master cylinder and adjustably and detachably supported therein, the opposite, inner end of said insert being of uniform diameter and of a reduced size and snugly engaging in said cavity of the master cylinder and being maintained by the threaded connection of the master cylinder and insert in predetermined spaced relationship to the inner end of said tapered bore, said inner end of the insert having an axially disposed bore portion of uniform diameter in which the cartridge case neck is snugly received.

2. An attachment as in claim 1, said insert having an outwardly flared frusto-conical bore portion at its inner end forming an extension of the cartridge case neck engaging bore portion and sized to snugly receive and reshape the cartridge case shoulder.

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