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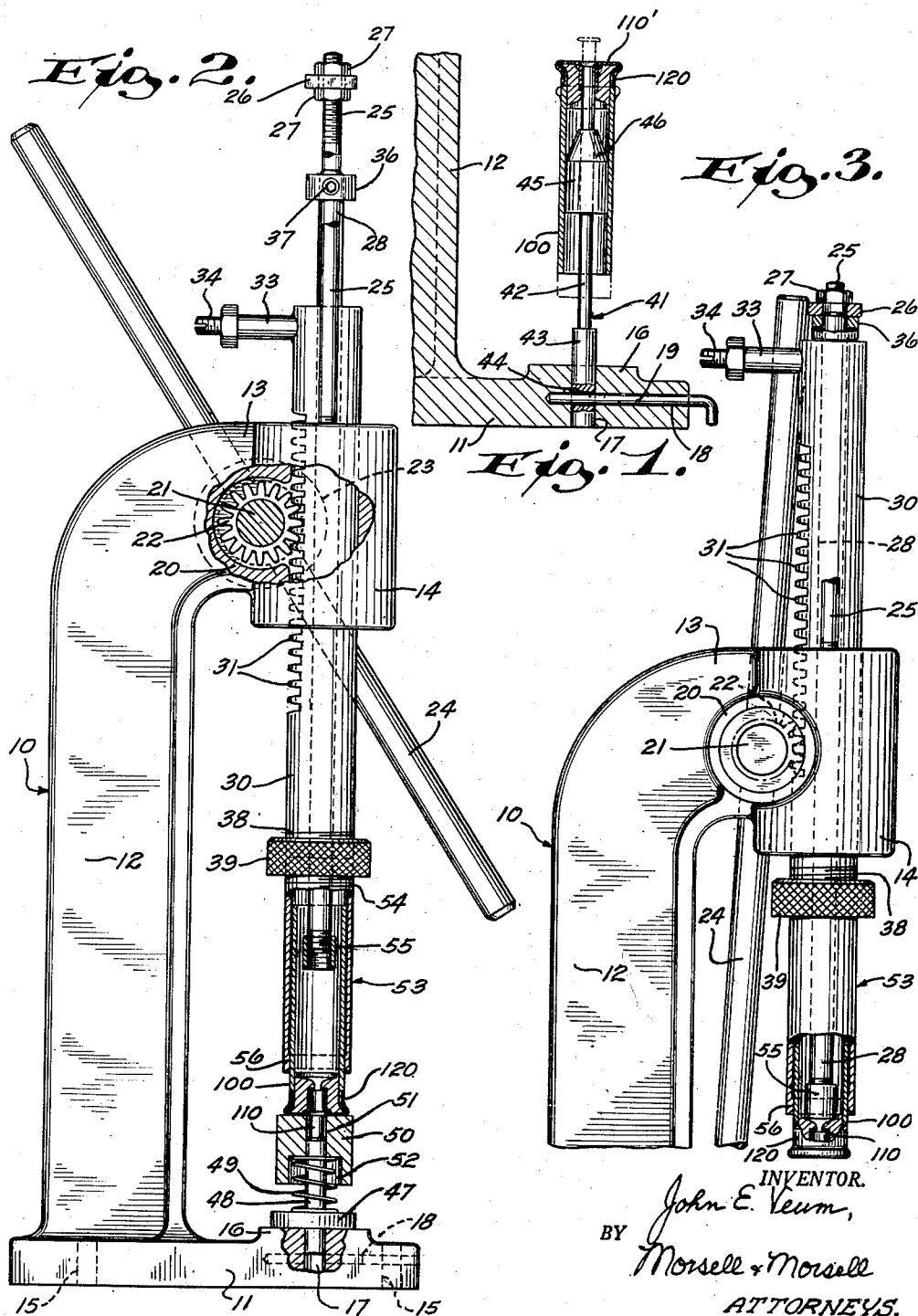
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2,807,186

SHOT GUN SHELL RECONDITIONING PRESS ASSEMBLAGES

Filed Nov. 22, 1954

3 Sheets-Sheet 1



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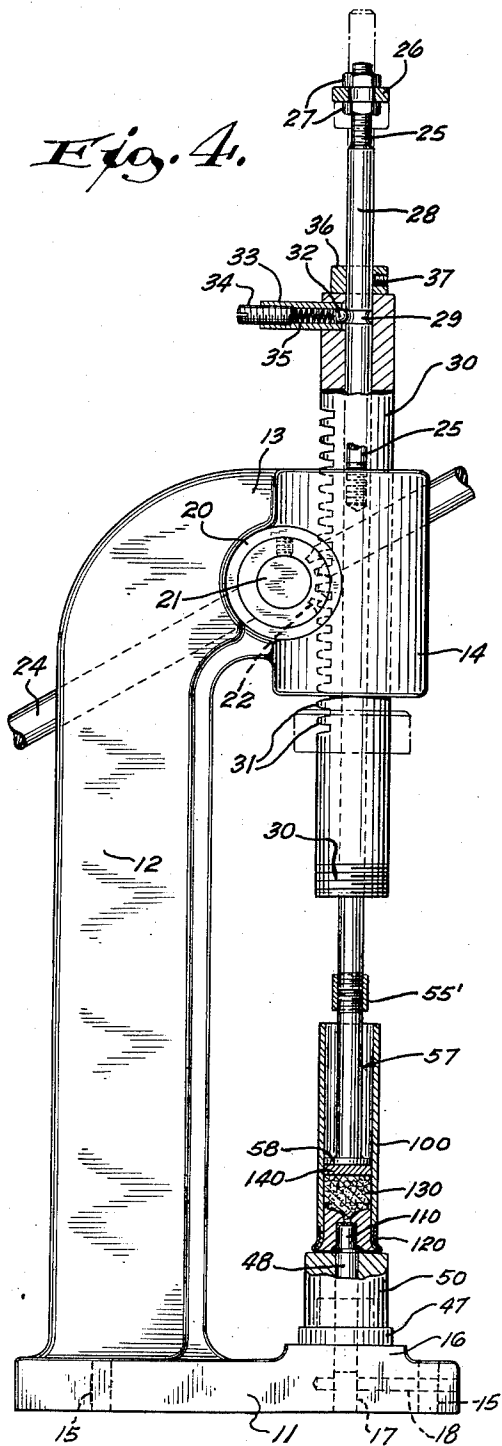
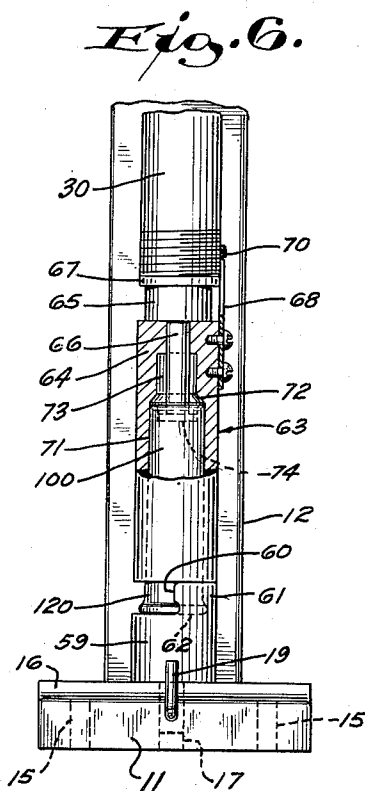
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3 Sheets-Sheet 2



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Fig. 5.

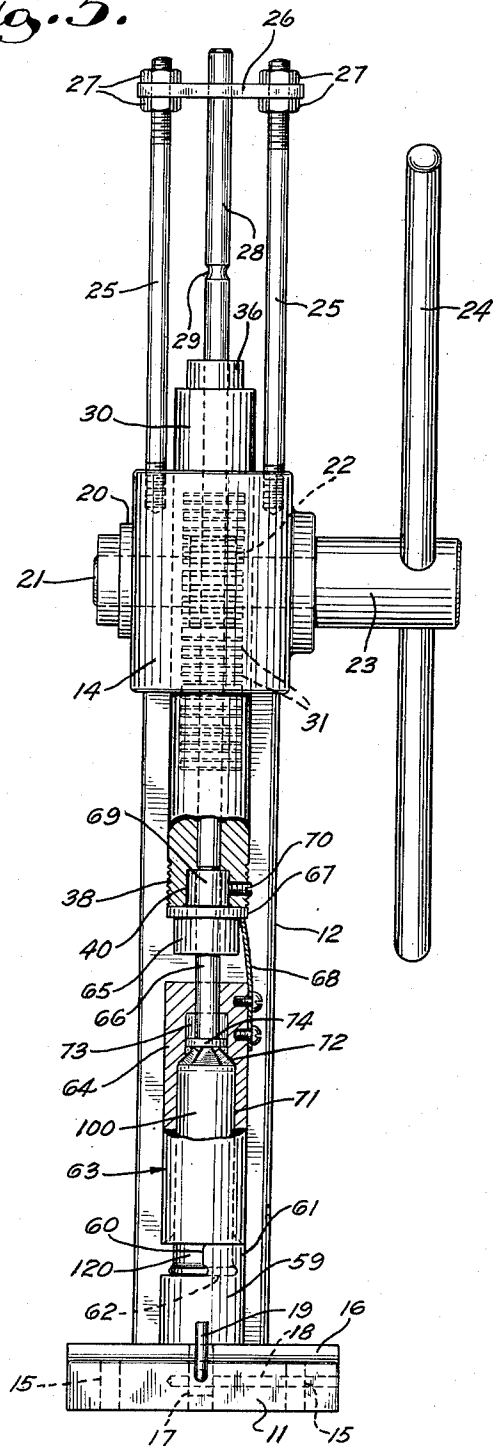
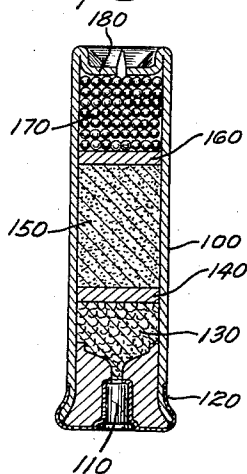


Fig. 7.



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SHOT GUN SHELL RECONDITIONING PRESS ASSEMBLAGES

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2 Claims. (Cl. 86—23)

This invention relates to improvements in shot gun shell reconditioning press assemblages.

Shot gun shells are relatively expensive, but due to the problems which are peculiar to the loading and reconditioning of shot gun shells no commercially satisfactory method or apparatus has heretofore been developed for completely reloading and reconditioning spent shot gun shell cases.

To completely reload and recondition a spent and salvaged shot gun shell case it is necessary to perform a number of operations including ejecting the spent primer and replacing it by a new primer, sizing the brass base of the shell case inserting predetermined related quantities of powder, filler, and shot within the shell case and separated by wads, seating and ramming the several wads, and finally crimping the end of the shell case opposite the brass base to close and finish the same and simultaneously truing or sizing the entire case.

In my prior Patent No. 2,655,831, issued October 30, 1953, I have disclosed a shot gun shell loading apparatus which will introduce the correctly related quantities of powder, filler and shot into a shot gun shell case regardless of the volumetric capacity of the shell case and regardless of the type of powder charge used in the case and which can be adjusted to compensate for the use of any weight of shot charge.

Consequently, the primary object of the present invention is to complement the shell loading operations accomplished with the apparatus of my prior patent by providing a press assemblage which is operable to decap and recap a shell case, to size the brass base of the shell, to seat and ram the over-powder and over-filler wads and to crimp and finish the outer end of the shell case.

A further object of the invention is to provide a simple manually operated press susceptible of receiving various attachments for the purpose of performing the above enumerated operations in connection with the reconditioning of a shot gun shell.

A further object of the invention is to provide a shot gun shell reconditioning press which includes a hollow ram with a knock-out rod associated therewith, each being reciprocable relative to the other for certain operations on a shot gun shell, together with means for locking the ram and rod together for release upon attainment of a predetermined pressure during operation on a shell case.

A further object of the invention is to provide a shot gun shell reconditioning press assemblage which is relatively simple, which is easy to operate, and which can recondition spent shot gun shells so satisfactorily that they are as efficient and effective in usage as new shot gun shells, such reconditioning, however, being accomplished at a fraction of the cost of a new shot gun shell.

A further object of the invention is to provide a shot gun shell reconditioning press assemblage which is compact and portable, which is strong and durable, which is expeditious and efficient in its operation, and which is well adapted for the purposes described.

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With the above and other objects in view, the invention consists of the improved shot gun shell reconditioning press assemblage, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a fragmentary vertical sectional view of the base portion of the press equipped with a shell primer ejector;

Fig. 2 is a side view, with parts being broken away and in section, of the press equipped with a shell recapping base appliance and a shell base sizing tube, showing the relative position of the operative parts immediately prior to the recapping and sizing operation;

Fig. 3 is a fragmentary side view of the upper portion of the press showing the relative location of the parts after the upward retraction of the ram and priming die and partial ejection of the shell case from the priming die;

Fig. 4 is a side view, with parts being broken away and in section, of the press fitted with a die and wad rammer such as is used in setting the over-powder and over-filler wads in position within the shell case;

Fig. 5 is a front view of the press equipped with the shell end crimping die showing the latter in one position of operation relative to the reloaded shell case;

Fig. 6 is a fragmentary view of that portion of the press which carries the shell end crimping die showing the latter in the position in which it performs the final flat crimping operation on the exposed end of the shell case; and

Fig. 7 is an enlarged vertical sectional view of a completely reconditioned shot gun shell case following all of the operations thereon by the improved press assemblage.

As was mentioned heretofore the object of the press assemblage, the subject matter of the present invention, is to perform certain operations in the reconditioning of a reloaded shot gun shell. In Figs. 1 and 2 the shot gun shell case 100 is one which has been salvaged and is to be refilled and reconditioned through the use of the device of my prior Patent No. 2,655,831 or with conventional filler wads in conjunction with the present press assemblage, it being noted that prior to reconditioning, the salvaged shot gun shell case 100 is empty, open at its outer end and contains in its brass base a spent primer. After the various operations have been completed the reconditioned shot gun shell 100 will be in the form illustrated in Fig. 7, wherein the spent primer has been ejected and replaced by a new primer 110. Within the cylindrical paper shell or case extending upwardly from the brass base 120 is a measured quantity of powder 130 over which there is a powder wad 140 followed by a measured quantity of a granular filler 150 over which there is a filler wad 160, followed by a measured charge of shot 170. In the alternative the press may operate on shell cases having conventional filler wads. The manner in which the quantities of powder, filler, and shot are measured for a given shot gun shell case is completely disclosed in my prior patent No. 2,655,831. Additionally, the reconditioning of the shell 100 includes a sizing or truing of the brass base 120, truing of the paper case and preliminary and final crimping operations to provide the folded over inwardly recessed outer end portions 180 which finally close the shot gun shell case and render it suitable for reuse.

As will best appear from Figs. 2, 4 and 5, the shot gun shell reconditioning press includes a relatively heavy metallic one-piece pedestal 10 having a horizontal flat base portion 11, a post portion 12 extending upwardly therefrom and a top horizontal extension 13 which terminates in a bored vertically directed cylindrical bearing cylinder portion 14. The base portion 11, generally of

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rectangular shape, is formed near its corner portions with apertures 15 for the reception of screws, bolts or other means for anchoring the base of the press to a flat support or table. The top surface of the base 11 forwardly of the post 12 is formed with a transversely extending raised flat supporting surface 16 formed with a central socket 17. There is also formed in the base extending from the front edge rearwardly and in registration with the socket 17 a horizontal bore 18 for the reception of an appliance locking pin 19 (see Fig. 1).

Formed integrally with the upper horizontal extension portion 13 of the post and the inner portion of the bearing cylinder 14 is a horizontally disposed transverse cylindrical bearing portion 20 which has an internal opening in registration with the vertical bore in the bearing cylinder 14 and which revolvably receives a horizontal shaft 21 having fast thereon within the portion 20, a rack gear 22. An outer end portion of the shaft 21 has fast thereon a sleeve 23 and for the purpose of manually turning said sleeve and shaft 21, an operating handle 24 is extended through registering openings therefor in the sleeve and shaft.

A pair of vertical stop plate rods 25 have their lower end portions anchored in the upper portion of the bearing cylinder 14 on opposite sides of the bore therethrough, and the upper end portions of said rods 25 are threaded and adjustably support a top horizontal stop plate 26 which is held in position by nuts 27. The mid-portion of said stop plate is apertured to permit the reciprocation therethrough of a vertical knock-out rod 28. Spaced from the top of said knockout rod is a locking groove 29 and except when in locked position, as will hereinafter be explained, the major portion of the knockout rod 28, from below the groove 29, is enclosed by a hollow ram 30 which extends through the bore in the vertical bearing cylinder 14 and which is formed with rack teeth 31 engaged by the teeth of the rack gear 22, whereby the hollow ram 30 may be reciprocated when the handle 24 is turned in either direction. There is a frictional engagement as between the knockout rod 28 and the hollow ram 30 so that the two may move together or independently, depending upon the pressures imposed thereon, and as previously explained, by means of the locking groove 29 in the knockout rod 28 and a spring-urged ballbearing 32, the knockout rod 28 and hollow ram 30 may be locked together for release upon the attainment of a predetermined pressure. The locking ballbearing 32 is housed within the inner end of a tube 33 secured within an opening in the ram 30, and by adjusting a screw 34 the force of a confined coiled spring 35 may be varied whereby the ballbearing 32 can be released from the knockout rod slot 29 upon the attainment of a predetermined pressure imposed on the secured together ram and knockout rod assemblage.

Adjustably mounted on a portion of the knockout rod 28 above the upper end of the ram 30 is a collar 36 which, for different operations, is loosely fitted on the top of the ram as shown in Figs. 4 and 5, or which, by means of a transverse set screw 37, may be secured to an upper portion of the knockout rod, as in Fig. 2, to form a stop by contact with the under portion of the horizontal stop plate 26 to limit upward reciprocation of the rod, as in Fig. 3.

The lower extremity of the hollow ram 30 is externally threaded as at 38 to receive an appliance attaching collar 39, and, as is best shown in Fig. 5, the lower end portion of the hollow ram 30 is formed with an enlarged socket 40 for receiving portions of other appliances.

From the foregoing the construction of the shotgun shell reconditioning press per se should be clear. As has heretofore been stated, however, the press is adapted to have associated therewith a number of appliances to accomplish various steps in the reconditioning of a spent and salvaged shot gun shell case. The shot gun shell case 100, besides being empty and open at its outer end, contains in its brass base 120 a spent primer 110' (see Fig. 1), and the first step is to expel from the brass base

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the spent or fired primer 110' and to true the internal cylindrical cavity in the shot gun shell case.

To permit this operation, the ram and knockout rod assemblage 30-28 of the press is preferably raised to an out of the way position and a primer ejector, designated generally by the numeral 41, is utilized, if desired, in the manner shown in Fig. 1. Said primer ejector 41 includes a shank portion 42 and a threaded lower or inner extremity on which a cylinder 43 may be removably mounted, said cylinder 43 conforming to the diameter of the socket 17 within the flat supporting surface 16 of the base of the press, resulting in a mounting of the primer ejector in the manner shown in Fig. 1, the same being locked in place by a locking pin 19 inserted into the horizontal bore 18 of the base and through a transverse aperture 44 provided in the lower or inner end of the cylinder 43.

Toward the upper or outer end of the shank portion 42 but below the outer extremity thereof is a guide cylinder 45 having a frusto conical outer end portion 46. When the shot gun shell is placed over the primer ejector 41 in the manner shown in Fig. 1 and is manually moved downwardly inwardly relative thereto, the outer end portion of the shank 42 will enter the spent primer 110' and upon further downward or inward movement of the case 100, the spent primer 110' will be ejected outwardly, as shown in dotted lines in Fig. 1, and the cylindrical portion 45 will true the interior of the case 100. When the case is removed from the appliance 41 it will be devoid of the spent primer. Although the appliance 41 may be used in the manner shown in Fig. 1, it is also insertible in the horizontal bore 18 of the base to project forwardly horizontally and in this event the socket engaging cylinder 43 is removed from the inner end of the shank 41.

The operating end portion of the appliance 41 will then project forwardly of the front end of the base and the spent shell case 100 can be slipped onto the appliance manually and pushed inwardly to eject the spent primer.

The second step is to recap the case with a new primer and to size the brass base 120 of the case. For these operations the press is arranged and fitted with appliances shown in Fig. 2 of the drawing. A base disc 47 is integral with an axially disposed stem 48 whose lower end portion is seated in the socket 17 of the base portion 16 of the press with the base disc then seating firmly on the top surface of the press portion 16. A coiled spring 49 surrounds a portion of the stem 48 above the disc 47 and the upper end portion of the stem 48 enters the axial bore 51 of a cylindrical plug 50 in whose under portion there is a socket 52 into which the upper end of the spring 49 extends whereby the plug is normally yieldingly supported spacedly above the top of the disc 47, as shown in Fig. 2. The upper or outer end portion of the bore 51 of the plug 50 is of a size to receive therein a new primer 110. The shot gun shell case 100 from which the spent primer was ejected as in Fig. 1 and which is to receive the new primer is mounted on the top of the plug 50 with its brass base 120 lowermost, and a hollow cylindrical sizing die 53, is applied to the lower end portion of the hollow ram 30 by the appliance attaching collar 39 engaging external threads 54 on the upper end portion of the cylindrical die 53. Also, a primer restraining collar 55 is threaded onto the lower end portion of the knockout rod 28.

For the recapping operation, the knockout rod 28 is not cocked to the hollow ram 30 and the collar 36 is secured to the upper end portion of the knockout rod 28 by means of the set screw 37, as shown in Fig. 2. Initially, through movements of the handle 24, and the action of the rack gear 22 and rack teeth 31 on the ram, the ram and knockout rod are raised. Then, upon a reverse movement of the handle 24 the assemblage is lowered to permit the cylindrical die 53 to enclose and envelop the shell case 100. Upon further movement of the handle

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24 the lower bevelled internal portion 56 of the die 53 will engage and size the brass base 120 of the case 100 and additional pressure will cause depression of the plug 50 against the force of the spring 49 until it contacts the top surface of the disc 47 during which movement the upper end of the stem 48 will push the new primer 110 into proper position within the brass base of the case 100. Thereafter, a reverse movement is imparted to the operating handle 24 of the press to raise the ram and knockout rod assemblage, also raising with it the reprimed and resized case 100. Upward movement of the ram and knockout rod assemblage is ultimately limited by contact of the collar 36 with the undersurface of the stop plate 26, as shown in Fig. 3. Thereupon, further turning of the handle 24 in the same direction will cause relative downward projection of the knockout rod 28 relative to the ram 30, die 53, and enclosed case 100 until the condition shown in Fig. 3 attains, following which further lowering of the knockout rod will cause, through pressure imposed by the collared lower end portion of the knockout rod, ejection of the reprimed and resized case 100 from the die 53. The collar 55 on the lower end of the knockout rod prevents the replaced new primer from being pushed through the case.

With the several steps depicted in Figs. 1, 2 and 3 having been completed, the reprimed and resized shot gun shell case may now have introduced thereinto a predetermined quantity of powder 130 over which a powder wad 140 is to be placed. For correctly seating the overpowder wad 140, the press and shell case 100 are arranged in the manner disclosed in Fig. 4 wherein the spring 49 is removed from the stem 48 of the base disc 47 and the plug 50 is seated directly on the top face of the base disc 47 supporting the shot gun shell case 100 in which there is the measured powder charge 130 over which there has been placed the over powder wad 140. An internally threaded coupling collar 55' on the lower end portion of the knockout rod 28 engages the threaded upper end portion of the cylindrical shank of a wad rammer 57 having an enlarged disc-like lower extremity 58 of a circumference to snugly fit within the case 100 and to contact the top of the wad 140. When the knock-out rod 28 is "cocked" to the ram 30, as hereinafter described, the collar 36 seats on the upper end of the ram 30 and is secured to the rod 28 by the set screw 37. While it is desirable to pack and compress the measured quantity of powder 130 within the case 100 by pressure applied to the over-powder wad 140, the maximum pressure to be applied is predetermined and is dependent upon the powder in use. For this operation the knockout rod 28 is releasably locked to the ram 30 by means of the spring urged ballbearing 42 seating in the knockout rod groove 29, as in Fig. 4, and the force necessary to permit disengagement of the ballbearing from the groove and consequent release of the knockout rod from the ram is regulated by the adjustment screw 34.

Consequently, the device is thus pre-set for a predetermined maximum pressure and with the knockout rod 28 and ram 30 locked together, when the handle 24 is turned in the proper direction, the disc extremity 58 of the wad rammer contacts the wad 140. Upon further downward movement of the assemblage, pressure will be applied against the wad and powder to compact the same until the predetermined pressure has been attained whereupon further force applied to the handle 24 will cause a release as between the ballbearing 32 and the rod groove 29 thereby separating the knockout rod 28 and ram and preventing the wad rammer 57 from exerting further pressure on the wad 140.

When this condition is attained, the handle 24 of the press should be turned in a reverse direction to raise the ram 30 and wad rammer 57 free of the shotgun shell case 100. Ultimately the collar 36 will engage the stop plate 26 which will limit further upward move-

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ment of the knockout rod 28 and permit relative movement of the ram 30 until the rod groove 29 registers with the ball bearing 32 which snaps into said groove and re-locks the rod and ram for a subsequent wad ramming operation.

The next step is to deposit into the case 100 a predetermined measured quantity of a granular filler 150, which can be accomplished by the apparatus of my prior Patent No. 2,655,831. Within the shell case and over the filler is placed a filler wad 160 and the shell is then replaced on the plug 50 of the press and the previous step is repeated with the knockout rod 28 and ram 30 being cocked together for release after the attainment of a predetermined pressure imposed on the wad rammer against the filler wad 160. When the filler wad has been rammed home and the filler compacted under the predetermined maximum pressure, the press handle is operated to raise the assemblage and expose the case 100 which is next loaded with a predetermined measured quantity of shot 170 which may also be performed by the apparatus of prior Patent No. 2,655,831. The reloaded shot gun shell case is then ready for the final end crimping operation which is accomplished on the press with the appliances illustrated in Figs. 5 and 6. At this point it may be stated that some of the reconditioning operations described and specifically the wad ramming operations can be performed on a shot gun shell case loaded with conventional filler wads.

To prepare the press for final crimping operations, all attachments are removed from the lower end of the knockout rod 28 and the collar 36 is permitted to seat freely on the upper end of the hollow ram 30 unsecured relative to the knockout rod 28. The previous appliances are removed from the base portion 16 and are replaced by a shell holder 59 having an integral axially depending pin which enters the socket 17 of the base portion.

The locking pin 19 is inserted through the base bore 18 and through a registering transverse opening in the lower stem portion of the shell holder to position the shell holder with the opening 60 in its collar 61 oblique to the longitudinal axis of the base 11 whereby the brass base 120 of the shell case may be slid into the collar opening 60 at an angle, with the lower flange of the base engaging in a groove 62 in said shell holder, preventing upward withdrawal of the case. The shell case crimper is designated generally by the numeral 63 and the same includes a lower cylindrical element 64 and an upper cylindrical element 65 reciprocally joined to the element 64 by a stem 66. The top portion of the cylindrical element 65 is flanged outwardly as at 67 to engage the lower end portion of the ram 30 when the shell crimper 63 is operatively carried by the ram and to also form a shoulder for releasably engaging the upper end portion of a band spring 68 in the manner shown in Fig. 5 to temporarily maintain separation as between the crimper elements 64 and 65, the lower end portion of the band spring being affixed to the crimper element 64.

The bore through the ram 30 has the enlargement 40 at its lower end previously mentioned and for the attachment of the shell crimper to the ram an integral cylindrical boss 69 projecting upwardly from the flanged portion 67 is received within said bore enlargement 40. Retention of the crimper in the attached position is accomplished by tightening a set screw 70 which is threaded through the lower end of the ram to cause it to impinge against the boss 69.

The internal construction of the crimper element 64 is best shown in Figs. 5 and 6 and it will be noted that from the lower end of the element 64 upwardly there is an enlarged socket 71 of a diameter to receive the shot gun shell case 100 and of slightly less length than the length of the shot gun shell case before its outer end is crimped. The upper end portion of the enlarged socket

71 is tapered inwardly, as at 72, on an angle of approximately 45°, and above the tapered portion 72 is a bore 73 of a diameter to receive the headed lower extremity 74 of the connecting stem or crimping plunger 66.

The purpose of the crimping operation accomplished by the crimper 63 secured to the lower end portion of the ram is to close and crimp the open upper or outer end of the shell case 100 to produce the condition shown in Fig. 7. The reloaded shell case, which has undergone all of the operations previously described, is engaged in the shell holder 59 on the base of the press in the manner shown in Fig. 5, with the ram and rod in raised or retracted position and with the crimper attached to the ram.

In the initial crimping operation the free end of the band spring 68 is engaged under the shouldered flange 67 of the element 65 in the manner shown in Fig. 5 to effect and retain relative projection or separation of the crimper element 65 and the crimper element 64, the spring being held in this engaging position by the finger pressure thereagainst. Then the press handle 24 is turned in a direction to cause the ram and knockout rod assembly to lower with the lower end of the knockout rod 28 contacting the upper end of the crimper boss 69.

Turning movement of the handle and lowering of the ram assembly will lower the crimper element 64 to cause it to envelop the mounted shell case 100 and the lowering movement is continued until the crimper element 64 contacts the shell holder 59 at which time the upper peripheral portion of the shell case is bent inwardly at a 45° angle by contact with the tapered internal portion 72 of the element 64.

Next, by releasing the free end of the spring 68 from the flange 67 upon further lowering movement of the ram, the crimper element 65 can move toward the element 64 until the position of Fig. 6 is attained during which movement the crimping plunger, including the stem 66 and headed portion 74, presses downwardly against the initially crimped upper end of the shell and folds it firmly flatly downwardly as in Fig. 7 to ultimately provide a closed recessed and finished outer end for the reconditioned shell case.

Then, if the press handle 24 is turned in an opposite direction to raise the ram assembly, the crimper element 63 will lift away from the shell which is retained in position by the shell holder 59. Upon the complete disengagement of the crimper from the shell, the shell may be slid laterally outwardly through the holder opening 60 and is a completely reconditioned shot gun shell which has been recapped, resized, reloaded and re-crimped.

The improved shot gun shell reconditioning press assembly performs the desired reconditioning operations

on a used and salvaged shot gun shell in an extremely simple and efficient manner involving a minimum of effort and expense.

The press and the appliances attachable thereto function without undue skill on the part of the operator and if the reconditioning appliances are utilized in the proper manner and sequence, the assemblage is substantially "foolproof" and produces reconditioned shot gun shells suitable for use by the most discriminating sportsmen.

Various changes and modifications may be made without departing from the spirit of the invention, and all of such changes are contemplated as may come within the scope of the appended claims.

What is claimed as the invention is:

1. A shot gun shell reconditioning press, comprising a pedestal having a flat base portion, a hollow ram vertically reciprocatably carried by an upper portion of said pedestal, means for supporting a shell on said flat base portion, a shell conditioning appliance carried by an end portion of the ram to operate on external portions of a supported shell upon reciprocations of the ram, a rod telescopically associated with the ram, positive means to cause movement of the rod with or independently of the ram, said rod being of greater length than the ram and operable on internal portions of a supported shell, an apertured stop plate supported above the pedestal and through the aperture of which the outer end of said rod may movably extend and a stop collar of greater size than the aperture in the stop plate positionable on the outer end of the ram or on a selected outer end portion of the rod for contact with the stop plate upon upward reciprocations of the ram to limit one directional movement of either the ram or the rod.

2. In combination, a pedestal having a flat base portion, a shell case holder removably mounted on said base portion, a hollow ram vertically reciprocatably carried by an upper portion of said pedestal, a shell conditioning appliance removably carried by a lower portion of the ram, a rod telescopically associated with the ram, means releasable upon the attainment of a predetermined pressure reacting against the ram for latching the rod to the ram for certain operations, a fixed stop carried by the pedestal above the ram and formed with an aperture therein through which said rod may movably extend, and a cooperating stop member selectively attachable to the rod for engagement with said fixed stop member to limit upward movement of the rod.

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