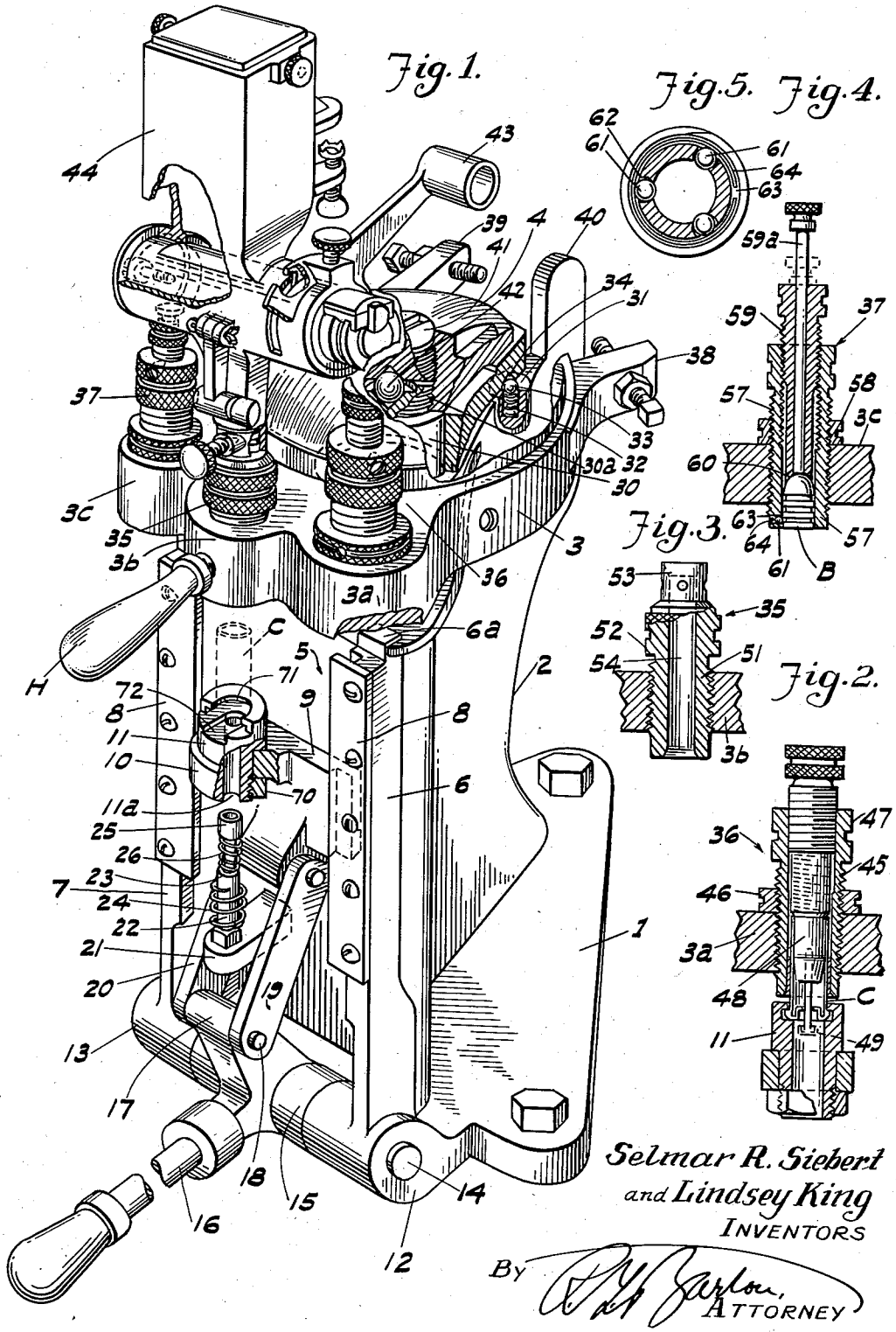
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LOADING TOOL

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LOADING TOOL

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The present invention relates to devices for reloading fired metallic center fire cartridge cases and particularly to a tool wherein the four major operations necessary to complete the reloading of a shell are accomplished in a more accurate and efficient manner.

It is one of the important objects of the invention to provide a tool of the above mentioned character employing a novelly mounted mechanism incorporating a revolving turret or head which carries the attachments consisting of the resizing, decapping and belling or flaring die, the powder measure, and the bullet seating die, whereby the various operations are made continuous, consecutive and performed in a single working cycle.

It is one of the important objects of the invention to improve in general upon the various instrumentalities ancillary to the cartridge reloading operation wherein the employment of fewer parts is accomplished thereby expediting and speeding up the loading operation.

It is another object of the invention to provide a series of detachable adapters or cartridge case holders which may be quickly and easily applied whereby the loading of different sized calibre cartridge cases is provided for by a greatly simplified mechanism.

It is another object of the invention to provide an improved slide or rectangular guide bar including an offset support wherein the different sized shell holders employed for gripping the cartridge cases may be installed and permit such adapters and cartridge cases to be placed in axial alinement with the attachments and in parallel alinement with the slide.

It is a still further object of the invention to provide an improved die incorporating a friction device for use in connection with straight cases whereby the bullet is mechanically seated and the true alinement and concentricity of the bullet relative to its case is assured.

It is a still further object of the invention to provide an improved cooperating primer stem and support for the slide whereby a variable stroke of the shell holder with relation to the attachments is made possible.

It is a further object to provide an improved bullet seating die wherein danger of the formation of a vacuum tending to disclocate the bullet after it has been seated, is eliminated. This object is preferably secured by providing an improved bullet seating die provided with a vent and a stem cooperating with the vent having an indicating function as well.

Yet still further objects and improved constructive features will hereinafter appear.

In the accompanying drawing which illustrates the device now being manufactured:

Fig. 1 is a perspective view of our improved tool.

Fig. 2 is a longitudinal mid-section taken thru the attachment containing the resizing die, and including in the view a portion of the adapter which cooperates therewith.

Fig. 3 is a fragmentary longitudinal section view thru the die to which the device for supplying the measured charge of powder is attached.

Fig. 4 is a longitudinal mid-section thru the bullet-seating die.

Fig. 5 is a transverse section thru the bullet alining and concentering device.

The improved tool comprises a base 1, an upstanding frame 2 mounted on said base, and a turret headpiece 3 swingably mounted between the cap 4 and said frame.

The front portion of said frame is provided with a vertically extending hollow crotch or groove 5 with laterally spaced flanges 6 and 7 at its sides which are milled out and have fastened to them guide plates 8 to form a slideway wherein is mounted the vertically reciprocating crosshead 9. The crosshead 9 is provided with an offset portion 10 which is adapted to detachably support interchangeable adapters or shell holders 11 to accommodate the loading of various sizes of cartridge containers. The axes of the various adapters will always be parallel to the axis of the crosshead or eccentric thereto.

At the foot of the crotch 4 the flanges 6 and 7 are developed into bosses 12 and 13 providing bearing seats for the pin 14 on which is swingably mounted the casting 15 to which is fastened the manually elevatable and gravitationally depressible operating arm 16. The casting 15 is provided with a lever arm 17 to which is pivotally fastened by means of the pin 18 the ends of the toggle links 19 and 20 forming therewith a toggle joint. The other ends of said links are in turn pivotally fastened to the crosshead or slide aforementioned so that by elevating and depressing the arm 16 the crosshead is reciprocated in its slideway.

At a suitable point between the crosshead and pivotally connected casting 15 is extended from the face of the crotch a stationary support 21. Said support contains a tapped hole into which is rigidly screwed one end of the stationary primer stem or plunger 22. Said stem is located in axial

alinement with the bore 11*a* of the shell holder and is provided with a shoulder 23 near its midlength on which is seated a spiral spring 24. The spiral spring is adapted to yieldingly support the weight of the crosshead and co-related parts so that (owing to the fact that said spring is sufficiently strong to overcome the weight of the crosshead and its cooperating parts) the stroke of the operating handle may be reduced to a minimum in accommodating the reloading operation of the various lengths and sizes of shells.

The upper end of the primer stem is reduced to a shank substantially the diameter of the primer and has yieldably mounted thereon the primer cup 25 by means of the spiral spring 26 wound around the reduced diameter of the stem. When the primer cap is placed in the primer cup and the shell holder is retracted over the cup, the cup is depressed thru the compressing of the spring and the shank of the primer stem advances the primer in the hole in the cartridge case. Exerting additional pressure on the operating handle after the foregoing operation will recap the empty shell.

The turret headpiece 3 is rotatively mounted upon a circular boss 30 which upstands from the central portion of the frame 2, and the base of the headpiece 3 frictionally contacts with the upper ends of the flanges 6 and 7, one point of contact being shown at 6*a* in Fig. 1, and a boss 31 formed in the frame forming the third point of contact. Housed in the boss 31 is a retractible spring 32 carrying a spring pressed ball 33 which engages in a socket 34 of the headpiece when the central attachment 35 is axially alined with the shell holder or cartridge case contained therein. The headpiece also carries attachments 36 and 37 and has radial lugs 38 and 39 on the head to engage with stop 40 on the frame to arrest the swing of the head at the points where attachments 36 and 37 axially aline with the cartridge case. The cap 4 is screwably fastened to the reduced threaded part 30*a* of the boss 30 and concentrically screwed into said cap is a screw 41. Said screw and the reduced portion of said boss are sufficiently milled out to provide a ball seat for the ball 42 whereby when the cap is screwed to said reduced portion said ball will properly aline the abutting faces of the turret and cap.

Attachment 36 is the die in which the cartridge case is resized, decapped and the mouth thereof is belled. Attachment 35 carries the powder measuring and charging device. Rotating the lever 43 of the powder container 44 causes the charge of powder contained therein to be emptied thru the attachment 35 into the shell. Attachment 37 contains the bullet seating die in which the bullet is seated prior to its insertion in the shell.

The three attachments 35, 36 and 37 are all tapped into the turret headpiece 3 and are correctly positioned both radially and circumferentially to insure that when said turret is swung thru its working cycle there will be an accurate alinement of the shell treating parts.

In Fig. 2 is shown in detail the die which performs the resizing, decapping and belling operations upon the shell of the cartridge. Said die comprises an externally screw threaded sleeve 45 which is screwed into the turret flange 3*a* in a vertical position. A lock nut 46 may be employed to lock said sleeve in its adjusting position. The upper end of said sleeve is preferably furnished with knurled head 47.

Said sleeve 45 has an internally screw threaded portion near its upper end into which is screwed the resizing and belling die member 48.

In Fig. 2 is also included a cartridge shell C and the upper portion of the adapter 11 which is shown in the position it assumes as it decaps the primer cap 49.

The die 35 of Fig. 3 consists of an externally screw threaded sleeve 51 which is screwed into and extends thru the turret flange 3*b*. Said sleeve is provided with a knurled head 52 having a diametrically reduced upper extension 53 to receive the lower end portion of the powder magazine member 44. Thru said head and its extension 53 extends the powder feeding bore or passage 54 into the lower portion of which the shell is projected incident to loading.

The bullet seating die shown in Figs. 4 and 5 comprises an externally screw threaded cylindrical sleeve or casing 57 which is screwed into a screw threaded bore provided therefor thru the turret flange 3*c*, a lock nut 58 serving to secure said sleeve in its adjusted position.

Into said sleeve screws an elongated bullet seating die 59. The lower end of said die is concaved as shown at 60 in order to conform to the ogival contour of the nose of the bullet B.

A bullet ejecting rod 59*a* slidably fits within the bullet seating die 59. Said rod not only serves to eject an impacted bullet, but also indicates the presence of a bullet. If a bullet becomes jammed in the die, said rod may be operated to eject it.

Owing to the loose fit of said rod within the bore which it occupies an air vent is provided therearound which prevents a vacuum from being formed above the bullet. A vacuum might cause the bullet to withdraw from the shell on attempting to remove the latter.

The cylindrical die sleeve or casing 57 is provided with means for mechanically centering the bullet B. Said centering means includes a series of balls 61, each of said balls having a seat 62 which is deep enough to allow the inner side of the ball therein to protrude beyond the inner periphery of the sleeve. Said seats 62 are formed in the bottom of a circular groove 63, and within said groove is seated a resilient snap ring 64 which yieldingly opposes the radial extension of said balls as the circumferentially grooved bullet B is urged into place between them. When the bullet has thus been forced into position to be operated upon by the die, said balls enter the grooves of the bullet and accurately centers and aligns as shown in Fig. 4.

Describing more in detail the adapter 11 in which the shell casing C is mounted incident to being subjected to the various operations in the working cycle, said adapter is provided with a reduced portion which is fitted snugly into the bore of the offset portion 10 of the crosshead, the terminal portion of the adapter which protrudes thru the bore being threaded and has screwed thereonto a nut 70 whereby the adapter is rigidly secured to the crosshead.

The adapter is provided with means whereby a cartridge container may be detachably secured therein, said means including a semi-circular internal groove 71 into which the crimped rim of the closed end of the cartridge shell is inserted, and an emergency withdrawal slot 72 (see Fig. 1) to provide an unobstructed exit for the primer in case fouling causes the primer to protrude.

The major operations employed in the working cycle of reloading a fired shell will now be described.

The shell C is placed in the adapter 11. The head 3 is swung by means of the handle H so that attachment 36 alines with the shell C. The handle 16 is manually elevated and the operation of decapping, resizing and belling is performed. The handle 16, under the influence of gravity, is then permitted to retract permitting the primer cup 25 to be extended into the bore 11a and the weight of the crosshead and cooperating parts to be assumed by the spiral spring 24 by virtue of the adapter yieldably resting thereon. The primer cap having previously been inserted in the primer cup, by further depressing the handle 16 the cap in the cup is caused to be seated in the hole of the case provided therefor.

The turret is then swung until attachment 35 is alined with the shell, whence the operating handle 16 is again elevated and the charge of powder is emptied from the powder container 44 into the shell. The operating handle is thereupon permitted to recede sufficiently to permit withdrawal of the shell from the attachment.

The turret is again swung until attachment 37 is alined with the shell whence the operating handle is again elevated. This operation brings the loaded shell into the bullet seating die, which has previously been supplied with a bullet B, and the bullet is forced into the shell, completing the cycle.

We claim:

1. An upstanding frame having a vertically extending crotch, laterally spaced flanges disposed at the sides of said crotch, plates fastened to said flanges thereby forming guide-bars, a vertically reciprocating crosshead mounted between said guide-bars, said crosshead being provided with an offset support for interchangeably fastening shell holders therein, operating parts comprising an operating arm fulcrumed at the base of said frame, a toggle arm outwardly directed therefrom, and toggle links connecting said arm and said crosshead; a stationary lateral extension depending from said frame in said crotch and projecting thru said links, a primer stem rigidly mounted on said extension, a swingable turret mounted on said frame, spaced attachments carried by said turret whereby upon swinging it in a plane at a right angle to said stem said attachments vertically aline with said shell holder and stem, a shoulder on said stem, a spiral spring carried by said shoulder, said spring being adapted to yieldably support said operating parts, said stem having its free end diametrically reduced, a primer cup, and means to retractably support said cup on the reduced portion of said stem, said shell holder being provided with shell gripping means, there being a bore extending thru said shell holder permitting its retractibility, said operating arm being manually liftable to operatively relate said shell holder and said attachments and gravitationally depressible to operatively relate said shell holder and said stem.

2. In a device of the kind described, a frame, a support projecting from said frame, a vertically extending plunger rigidly fastened to said support, a headpiece mounted on said frame and provided with attachments to swing in a plane at right angles to said plunger, stop means operatively related to said headpiece whereby said attachments are brought into axial alinement with said plunger, operating mechanism comprising a vertically reciprocable crosshead including an offset portion, and linkage pivotally connected to said frame and operatively related to said mechanism, means mounted on said plunger for retractibly supporting said mechanism and linkage, a shell holder mounted in said offset position and having a bore which axially alines with said attachments and plunger when said head is swung to its various stop positions, and an operating arm operatively related to said linkage, said arm being manually elevatable to operatively relate said shell holder and said attachments and gravitationally depressible to operatively relate said shell holder and said plunger.

3. In a device of the kind described, a frame, a support projecting from said frame, a vertically extending plunger rigidly fastened to said support, a headpiece mounted on said frame and provided with attachments to swing in a plane at right angles to said plunger, a cap for securing said headpiece to said frame, a ball mounted on said frame whereby to clamp the cap in an operative relation to said headpiece, stop means operatively related to said headpiece whereby said attachments are brought into axial alinement with said plunger, operating mechanism comprising a vertically reciprocable crosshead including an offset portion, linkage pivotally connected to said frame and operatively related to said crosshead, means mounted on said plunger for yieldingly supporting said mechanism and linkage in a retractible position, a shell holder mounted on said offset position and having a bore which axially alines with said attachments and plunger when said head is swung to its various stop positions, and an operating arm operatively related to said linkage, said arm being manually elevatable to operatively relate said shell holder and said attachments and being gravitationally depressible to operatively relate said shell holder and said plunger.

4. In a device of the kind described, a frame, a support projecting from said frame, a vertically extending plunger rigidly fastened to said support, a headpiece mounted on said frame and provided with attachments to swing in a plane at right angles to said plunger, stop means operatively related to said headpiece whereby said attachments are brought into axial alinement with said plunger, operating mechanism comprising a vertically reciprocable crosshead including an offset portion, and linkage pivotally connected to said frame and operatively related to said mechanism, means mounted on said plunger for retractibly supporting said mechanism and linkage, a shell holder mounted on said offset portion and having a bore which axially alines with said attachments and plunger, when said head is swung to its various stop positions, securing means to detachably support a cartridge case in said shell holder, there being a slot in said shell holder extending from the bore of said shell holder to the rim thereof adjacent said securing means to permit extraction of the shell in case the primer fouls, and an operating arm operatively related to said linkage, said arm being manually elevatable to operatively relate said shell holder and said attachments and gravitationally depressible to operatively relate said shell holder and said plunger.

5. In a device of the kind described, a frame, a support projecting from said frame, a vertically extending plunger rigidly fastened to said support, a headpiece mounted on said frame and provided with attachments to swing in a plane at right angles to said plunger, stop means operatively related to said headpiece whereby said attachments are brought into axial alinement with said plunger, operating mechanism comprising a

vertically reciprocable crosshead including an offset portion, and linkage pivotally connected to said frame and operatively related to said mechanism, means mounted on said plunger for retractibly supporting said mechanism and linkage, the free end of said plunger being diametrically reduced, a primer cup, means to retractibly support said cup on the reduced portion of said stem, a shell holder mounted on said offset portion and having a bore which axially alines with said attachments and plunger when said head is swung to its various stop positions, securing means to detachably support a cartridge case in said shell holder, there being a slot in said shell holder extending from the bore of said shell holder to the rim thereof adjacent said securing means to permit extraction of the shell in case the primer fouls, and an operating arm operatively related to said linkage, said arm being manually elevatable to operatively relate said shell holder and said attachments and gravitationally depressible to operatively relate said shell holder and said plunger.

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