

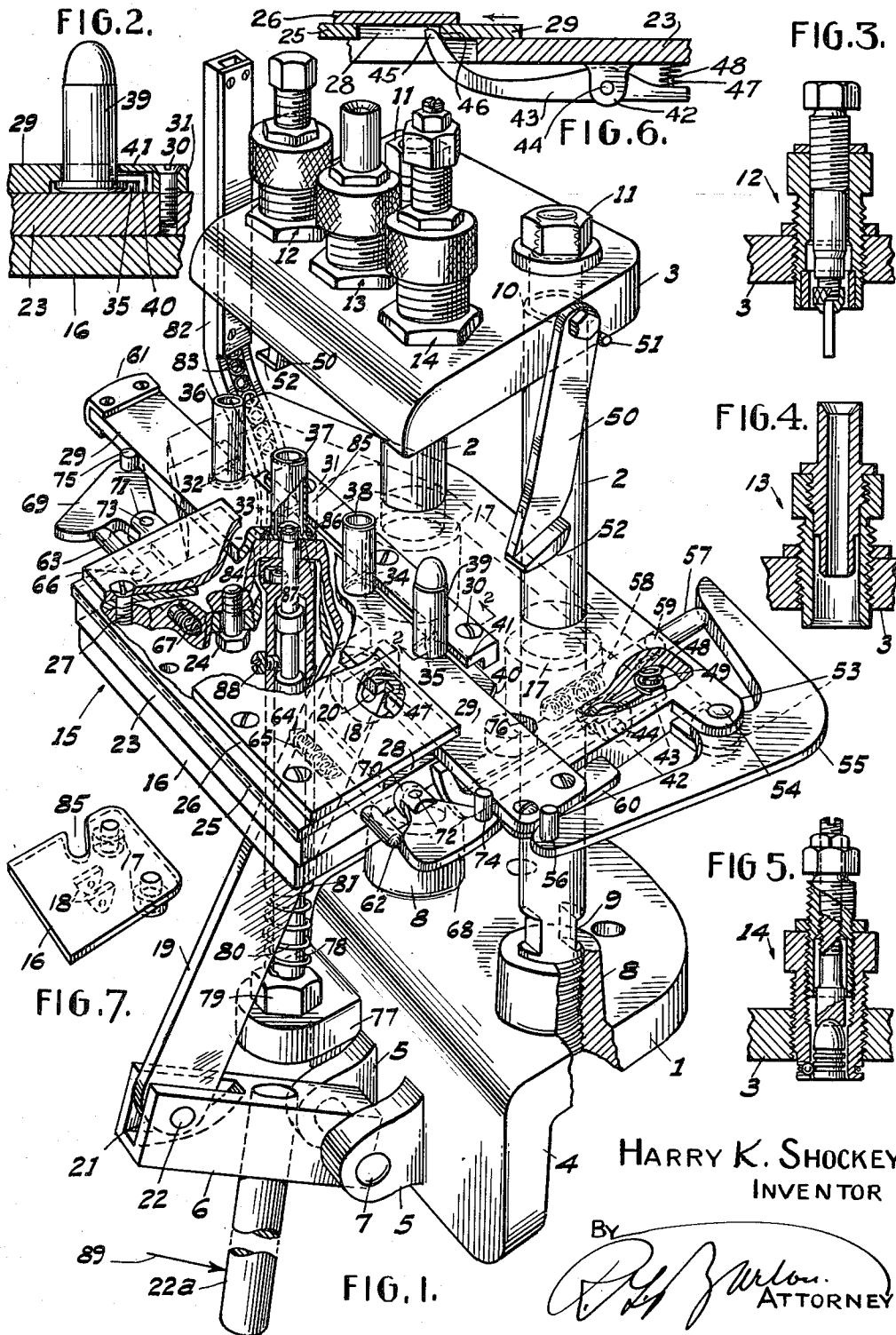
Aug. 31, 1937.

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2,091,397

MACHINE FOR RELOADING CARTRIDGE CASES

Filed Oct. 22, 1935



UNITED STATES PATENT OFFICE

2,091,397

MACHINE FOR RELOADING CARTRIDGE-CASES

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Application October 22, 1935, Serial No. 46,104

10 Claims. (Cl. 86—23)

The present invention relates to improvements in tools for performing the various operations entering into the work cycle of reloading an empty cartridge shell.

5 An important object of the invention is to provide in a device of the above character improved means for introducing the empty shells to the shell holder and then feeding them to the several attachments whereby the various operations
10 of decapping, resizing, recapping, reloading and seating the bullet are performed progressively, en masse, and when the work cycle has been completed the loaded shell is automatically ejected incident to performing the next step in the work
15 cycle.

Another object of the invention is the provision of a tool wherein the actual feeding for accomplishing the several consecutive steps, in the reloading of shells, is performed progressively in a straight line fashion.

20 Another object is to provide such a tool wherein the mechanism for re-positioning the shell carrier with relation to the shells automatically places them in a position wherein a single simple manual operation places each shell in a position
25 to have the next step in the work cycle of the operation performed upon it.

Still another object is to provide a device wherein the sliding shell holder is interchangeable for
30 different calibre shells.

With the foregoing and still other objects in view the invention consists in certain novel details of construction and combination and arrangement of parts all of which will hereinafter
35 be described more fully and the novel features pointed out in what is claimed.

In the accompanying drawing forming a part of the present application:—

40 Fig. 1 is a perspective view of my improved tool, some parts of which are broken away and others shown in section to disclose underlying construction and details.

Fig. 2 is a section taken on line 2—2 in the central part of Fig. 1.

45 Figs. 3, 4 and 5 are vertical sections respectively thru the resizing, powder attachment and bullet seating dies.

Fig. 6 is a side view of the locking lever and associated parts.

50 Fig. 7 is a perspective view of a portion of the table structure.

Now describing the invention part by part, 1 indicates the base, 2 uprights mounted on said base, and 3 is a headpiece supported by said
55 uprights. The base is provided with an apron 4

having affixed thereto spaced lugs 5 for swingably mounting therebetween a link 6 by means of a pin 7. The base is also provided with bosses 8. Said bosses are tapped and the lower ends of the uprights are threaded and the threaded ends of the
5 uprights are screwed into the tapped bosses. The uprights are notched at 9 to provide a hold for a wrench whereby the uprights may be forcibly secured to the base. The upper ends of the uprights are diametrically reduced to provide a
10 ledge 10 whereon to seat the headpiece and a part of each reduced portion is threaded for the application of nuts 11 whereby the headpiece may be securely joined to the uprights.

The headpiece 3 is provided with a straight line series of attachments for progressively performing
15 the work cycle of reloading a cartridge-case. Reading from left to right, 12 indicates the decapping, resizing and re-flaring die, 13 the powder attachment die, and 14 the bullet seating die.
20 Each of said attachments are respectively shown in section in Figs. 3, 4 and 5. All of these attachments are well known in the art. Since no claim is made per se, to them, their detailed description will be omitted for the sake of brevity
25 except where it may be necessary to allude to them later on in describing certain details of the operations.

A table 15 is slidably mounted on the uprights 2. Said table includes a bottom plate 16 provided with bosses 17 which encircle the uprights. On the underside of the plate 16 is provided a pair of spaced lugs 18 between which is mounted and to which is pivoted one end of the connecting rod 19 by means of the pin 20. The other end of the
35 connecting rod is fastened within the arched recess 21 of the link 6 by means of the pin 22.

To the link 6 is secured an operating handle 22a whereby the table 15 may be manually elevated and lowered to operatively relate it with the proper parts at the proper time.

The table 15 further comprises an intermediate plate 23 fastened to the bottom plate 16 by means of cap screws 24 screwed thereto from the underside, a spacer plate 25, and a cover plate 45 26. The spacer plate and cover plate are each in turn secured to the intermediate plate by means of machine screws 27. Thru the medium of the spacer plate, there is provided between the cover plate and the intermediate plate a space 28 in
50 which is movably mounted the cartridge-case holding and feeding plate 29.

There is fastened to plate 23, by means of screws 30, a stationary cartridge-case retaining plate 31 which cooperates with the plate 29 in
55

maintaining a longitudinal alinement of the shells with the attachments as the shell feeding plate is manually shifted from feeding position to operating and ejecting position.

5 The shell feeding plate 29 is provided with a straight line series of shell receiving apertures or notches 32, 33, 34 and 35 for supporting and gripping the cartridge cases 36, 37, 38 and 39. Three of said apertures and their respective car-
10 tridge-cases, or shells, namely 32, 36; 33, 37; and 34, 38; axially aline with the attachments 12, 13 and 14 during all upward travel of the table. However the apertures which engage the shells in the upstroke do not engage the same shells on
15 the down stroke. The position of the plate 29 with respect to the shells is shifted during the time the attachments are projected into the shell so that on the down stroke aperture 32 will have been shifted to the left to provide space for
20 another shell. Then the table is ready for re-elevating and the corresponding shell being treated will be ready for the next operation in the work cycle. It will therefore be obvious that, on the upward thrust of the table, aperture 32
25 will be provided with a shell and aperture 35 will be empty, but on the downward thrust of the table the reverse will be true.

The plate 29 also has a reinforcing and guide lip extension 40 which manually extends beneath
30 the flange 41 of the plate 31. The plate 29 is interchangeable for different calibre shells and when a substitute plate is inserted in the machine the location of the cooperating plate 31 is modified or a different one is used in order that
35 the two will always cooperate to insure an axial alinement of the various shells and the attachments into which they are projected. In the position which the plate 29 occupies in the drawing, shell 36 is in position to be shifted for de-
40 capping, resizing and re-flaring; shell 37 is in position to be shifted for receiving the powder charge; shell 38 is in position to be shifted for seating the bullet; and shell 39 is in position to be shifted for ejection thru the hole 42 into a
45 suitable container not shown. The shells are all manually shifted in the plate 29 in a battery formation with respect to the attachments and the plate 29 is reshifted automatically incident to disengaging the shells with the attachments
50 after the several operations have been completed on the various shells.

The mechanism involved in performing this cycle of the work will now be described.

From the under side of the plate 23, see Fig. 6,
55 downwardly depends a pair of spaced lugs 42 and between said lugs is pivotally mounted a locking lever 43 by means of a pin 44. The lever 43 is provided with a locking tongue 45 having a cam face 46. Said tongue engages within the
60 notch 47 of the plate 29 when the latter plate is manually shifted to the extreme right. In the latter position shells 36, 37 and 38 will axially aline respectively with the attachments 12, 13 and 14. The tongue 45 is forced into engage-
65 ment with the notch 47 by the spring 48, said spring being mounted on the boss 49 of the lever 43 with its free end bearing against the under side of the plate 23. In the position in which
70 plate 29 is shown, spring 48 is compressed, and the tension in the spring will seat the tongue 45 in the notch 47 as soon as the plate 29 is shifted to the right. The latter position will be maintained until plate 29 is automatically shifted
75 frontwardly, at which time the plate 29 will override the tongue 45, on account of the cam face

46, depressing it, whence it is automatically shifted leftwardly to the position now shown.

The headpiece 3 is provided with a pair of downwardly extending pendulously slung levers
5 50. Said levers are mounted so as to normally hang out of plumb in a direction pointing toward the plate 29 by means of the pins 51. The levers 49 each have a cam face 52. As the table is elevated the cam faces 52 engage with the
10 inside edge of the plate 29. The levers 50 contact with the plate 29 after the various attachments have been extended into the shells. This engagement of shells with the attachments maintains their axial as well as their longitudinal
15 alinement. During the interval of time the shells and the attachments thereabove are in engagement with each other, the shells are all completely acted upon and thus one step in the work cycle is performed. During this period
20 plate 29 is free to be shifted. Hence during the final stroke of the upward thrust of the table the levers 50 automatically shift the plate 29 frontwardly overriding the tongue 45 of the locking lever 43 until all the notches 32 to 35 are
25 free from their respective shells. Thereupon the plate 29 is automatically shifted leftwardly to the position shown.

The plate 29 is capable of receiving a quadri-
lateral shift, that is to say a shift along a path which would outline a rectangular surface. The
30 first of these shifts is performed manually to the right; the second shift is performed automatically frontwardly; the third automatically leftwardly; and the fourth automatically backwardly. The manual shift to the right has been de-
35 scribed, likewise the automatic shift frontwardly. The mechanism providing for the leftward and backward automatic shifts will now be described.

The plate 23 is provided with a pair of ears
40 53, between which is pivotally mounted, by means of a pin 54, an actuating lever 55. The lever 55 is substantially L-shaped and is mounted so that both of its free ends are workable. At the end of the lever's long leg is provided a pin 56 against
45 which the end of the plate 29 slides when it is automatically shifted frontwardly. When the plate 29 is manually shifted rightwardly, by virtue of this contacting relation, the pin 56 causes the lever 55 to swing about its axis or rotation in
50 a counter-clockwise fashion. The pin 56 is held in yielding contact with the plate 29 by means of a spring actuated plunger 57 which bears against the free end of the shift leg of the lever
55. The plunger 57 is actuated by a spring 58, there being a cavity 59 in the plate 23 in which
55 both the plunger 57 and the spring 58 are housed, the spring 58 being seated the deepest in the cavity. The plunger 57 acting under the influence of the spring 58 causes the lever 55 to swing
60 about its axis of rotation in a clockwise fashion and causes the pin 56 to shift the plate 29 leftwardly as soon as the arms 59 have shifted it frontwardly out of engagement of both the bat-
65 tery shells and the locking lever.

The plate 29 is provided with a stop plate 60
on its right end to limits its movement to the left and a stop plate 61 on the left end to limit its
70 movement to the right. Each of the plates 60 and 61 bear against the sides of the plate 23 when the plate 29 is either in the extreme left or
75 extreme right position. When in the extreme right position the tongue 45 of the locking lever engages within its cooperating locking aperture 47 to prevent immediate reshifting of the plate

automatically to the left by the pin 56 after it has been manually shifted to the right.

A somewhat similar construction to that just described is utilized to shift the plate 29 automatically backwardly whereby the notches in the plate engage with the shells differently to place them in position to be manually shifted to have the next step in the operation performed upon them and at the same time provide for a vacant aperture in which to insert a new shell. The latter construction embodies two additional spring pressed plungers 62 and 63, the numeral 62 indicating the plunger on the right of the table and 63 the plunger on the left of the table. The plunger 62 is housed in the cavity 64 in the plate 23 and actuated by the spring 65 located in the same cavity in back of the plunger. The plunger 63 is housed in the cavity 66 in the plate 23 and actuated by the spring 67 located in the same cavity and rearwardly of the plunger. Each of the plungers 62 and 63 oppose the retraction of cam plates 68 and 69 about their pivotal axes. Said plates 68 and 69 are mounted respectively between the upper and lower jaws projecting outwardly from the stub shafts 70 and 71, by means of pins 72 and 73 which form the pivotal axes for the latter plates.

The plates 68 and 69 are each provided respectively with stud pins 74 and 75. Said pins are yieldingly held in abutting contact with the outside edge of the plate 29 under the action of springs 65 and 67 thru the medium of the plungers 62 and 63. The plungers 62 and 63 tangentially graze the cam faces of the plates 68 and 69 to initiate contact of the pins 74 and 75 with the plate 29 at all times.

When the arms 59 automatically shift the shell holding plate 29 frontwardly, springs 65 and 67 are compressed so that as soon as the slots in the plate 29 have cleared the shell, the locking lever has depressed the lever 55, and the lever 55 has shifted it leftwardly, the pins 74 and 75 will automatically shift plate 29 backwardly thus completing the quadrilateral shift of the shell holding plate. This quadrilateral shift occurs each time the table is elevated and each time the shell holding plate is shifted to the right on the initial stroke of the quadrilateral shift, when once filled with shells, it will automatically discharge a completed shell thru the discharge aperture 76. This cycle may be repeated ad infinitum.

In the four major operations of reloading a shell one of these major operations is performed on the down stroke. This operation is that of recapping and is performed immediately after the shell has been resized and decapped. Mechanism whereby this operation is performed comprises the following.

On the front face of the apron 4 is provided a shelf 77. Into said shelf is screwed one end of the primer stem 78 and held fixedly thereto by means of a lock nut 79. Around the stem 78 is coiled a spring 80, and a sleeve 81 is slidably mounted on said stem and adapted to seat upon said spring.

The sleeve 81 carries a primer reservoir 82 from which primers 83 are fed thru the mouth 84 so as to seat upon the end of the primer stem. The sleeve 81 and primer reservoir 82 move upwardly and downwardly thru the slot 85 located in the bottom plate 16, see Fig. 7. The sleeve travels upwardly under the action of the spring 80 to permit the deposit of a primer on the end of the primer stem once the table is elevated after it has been depressed.

There is an aperture 86 in the plate 23 which axially aligns with the shell as well as with the attachment 12. This aperture is slightly larger than the free end of the primer stem 87 which carries the primer thru said aperture, but is of smaller diameter than the shell 37 which is seated on the plate 29 thereabove. The upper end of the sleeve 81 bears against the under side of the plate 23 to yieldingly support the table 15 thru the medium of the spring 80. A set screw 88 may be employed to limit the travel of the sleeve so that a primer will always be fed on to the end of the plunger. In the position in which the operating handle 22a is shown as opposed by a force indicated by the arrow 89 the recapping operation of the shell 32 has just been completed.

I claim:

1. A tool of the class described including a frame for supporting a straight line series of attachments progressively arranged for consecutively performing the work cycle of reloading a cartridge-case, a table including a shell holder, for supporting empty shells, operatively related to said attachments, means to automatically shift the shell holder's position with relation to the shells after each major operation has been performed on a shell, yieldable means for holding said shell holder in shifted position, said shell holder being manually re-shiftable whereby to re-position the shells with the attachments, and locking means for holding said shell holder in its re-shifted position.

2. In a tool of the class described, supporting means, a plurality of cartridge loading attachments mounted thereon equally spaced apart and in substantial alinement with each other, shell holding means arranged to hold a series of alined shells in a like equally spaced relation to each other and to relate them operatively to said loading attachments, means to advance said shell holding means in a direction lengthwise the alinement of said loading attachments to place it in position for operatively relating it with said attachments whereby to progressively perform loading operations upon said shells, a spring controlled means opposing said advancing means, locking means normally opposing the action of said spring controlled means, and means to shift said shell holding means out of and into engagement with said locking means.

3. In a device of the kind described, a frame, a plurality of attachments supported by said frame, said attachments being adapted for performing consecutive work operations on a shell as it is progressively advanced into engagement with them, a shell supporting means carried by said frame for supporting the shells to be collectively acted upon step by step by said attachments, means to advance and retract said supporting means whereby to place it in position to operatively relate said shells and said attachments, said supporting means being manually shiftable whereby to eject a completely loaded shell therefrom and to advance each remaining shell in position for its next operation, means to lock said supporting means in its manually shifted position, and means to automatically re-shift said supporting means after the performance of a working operation.

4. In a device of the kind described, a frame, a plurality of attachments supported by said frame, said attachments being adapted for performing consecutive work operations on a shell as it is progressively advanced into engagement

with them, a shell supporting means carried by said frame for supporting the shells to be collectively acted upon step by step by said attachments, means to advance and retract said supporting means whereby to place it in position to operatively relate said shells and said attachments, said supporting means being manually shiftable whereby to eject a completely loaded shell therefrom and to advance each remaining shell in position for its next operation, means to lock said supporting means in its manually shifted position, means to automatically re-shift said supporting means after the performance of a working operation, and yieldable means acting in opposition to each manual shifting and automatic shifting of said supporting means whereby to maintain the original position of said supporting means previous to its shifting.

5. In a tool of the class described, supporting means, a plurality of cartridge loading attachments mounted thereon equally spaced apart and in substantial alinement with each other, shell holding means arranged to hold a series of alined shells in a like equally spaced relation to each other, said shell holding means being manually shiftable in one direction to advance the shells progressively into an operative relation with said loading attachments, locking means to temporarily hold said shell holding means in said operative relation with said loading attachments until said attachments have performed their various operations, means to automatically shift said shell holding means in a direction athwart its aforesaid manual shifting the action of said automatic means causing a release of said locking means, and spring actuated means thereupon to shift said shell holding means in the opposite direction to that in which the same is manually shiftable as aforesaid, said spring actuated means comprising a spring pressed part having a sliding engagement with said shell holding means in order to maintain an operative relation thereto at the different positions thereof between which it automatically shifts.

6. A tool of the class described including a frame for supporting a straight line series of attachments progressively arranged for consecutively performing the work cycle of reloading a cartridge case, a table, including a shell holder provided with notches for supporting and re-

positioning shells fed thereto one at a time, operatively related to said attachments, and means comprising levers pivotally mounted on said frame engageable by said shell holder during its uplift to shift the shell holder's position with relation to the shells whereby each shell occupies a notch in advance of the one previously occupied.

7. A reloading device comprising a support, a head piece mounted on said support and provided with a straight line series of attachments, a table slidably mounted on said support, a shell holder mounted on said table, means to elevate said table whereby to operatively relate shells contained in said shell holder with said attachments, and a pair of levers mounted on the sides of said head piece rearwardly of said attachments so as to normally hang out of plumb in a direction pointing towards said shell holder, and projecting into the ascending path thereof.

8. The subject matter of claim 7 and, the foot portions of said levers each being provided with a cam face.

9. A reloading device comprising a support, a head piece mounted on said support and provided with a straight line series of attachments, a table slidably mounted on said support, a shell holder mounted on said table, means to elevate said table whereby to operatively relate shells contained in said shell holder with said attachments, and a pair of pendulously slung levers mounted on opposite sides of said head pieces and having their foot portions normally projecting out of plumb into the ascending path of said shell holder.

10. A tool of the class described including a frame for supporting a straight line series of attachments progressively arranged for consecutively performing the work cycle of reloading a cartridge case, a vertically reciprocable table including a shell holder, for supporting empty shells, operatively related to said attachments, means comprising levers pendulously supported by said frame and engageable by said shell holder during its uplift to automatically shift the shell holder's position with relation to the shells at the time that the attachments work on the shells, and yieldable means for holding said shell holder in shifted position.

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