

June 28, 1932.

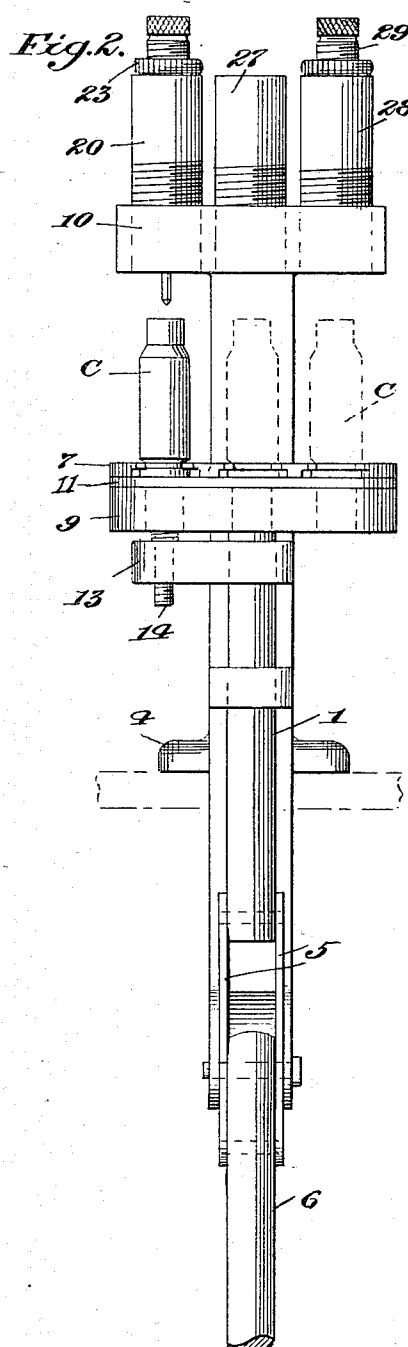
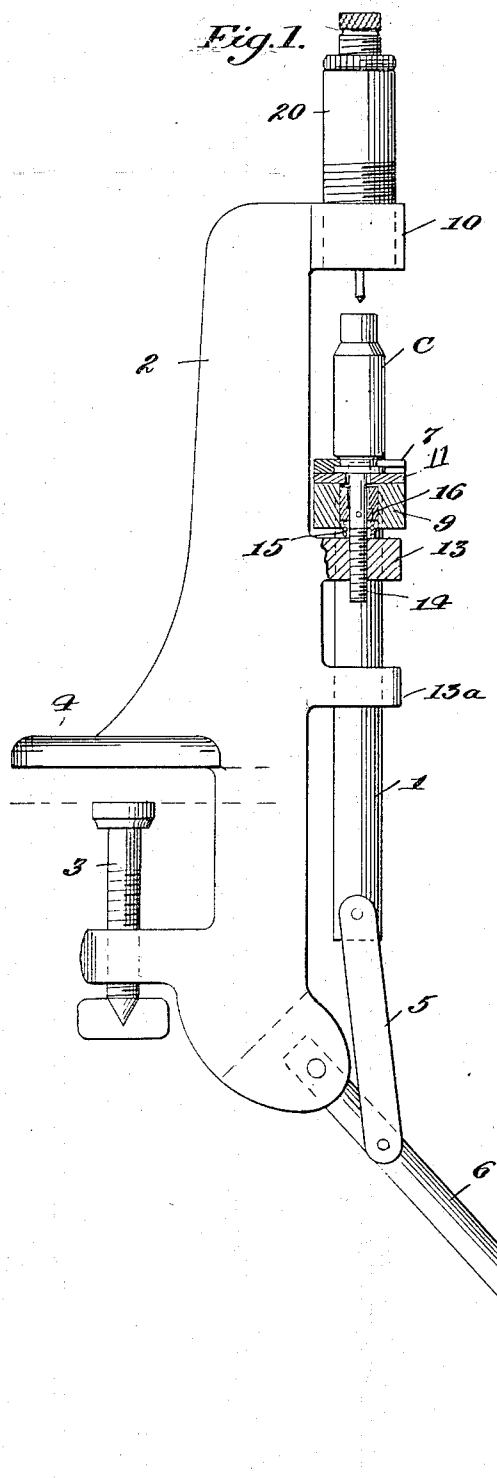
G. F. ZIMMERMAN

1,864,880

RELOADING TOOL

Filed Feb. 15, 1932

3 Sheets-Sheet 1



Inventor:
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by, Mason & Mason, Att'ys.

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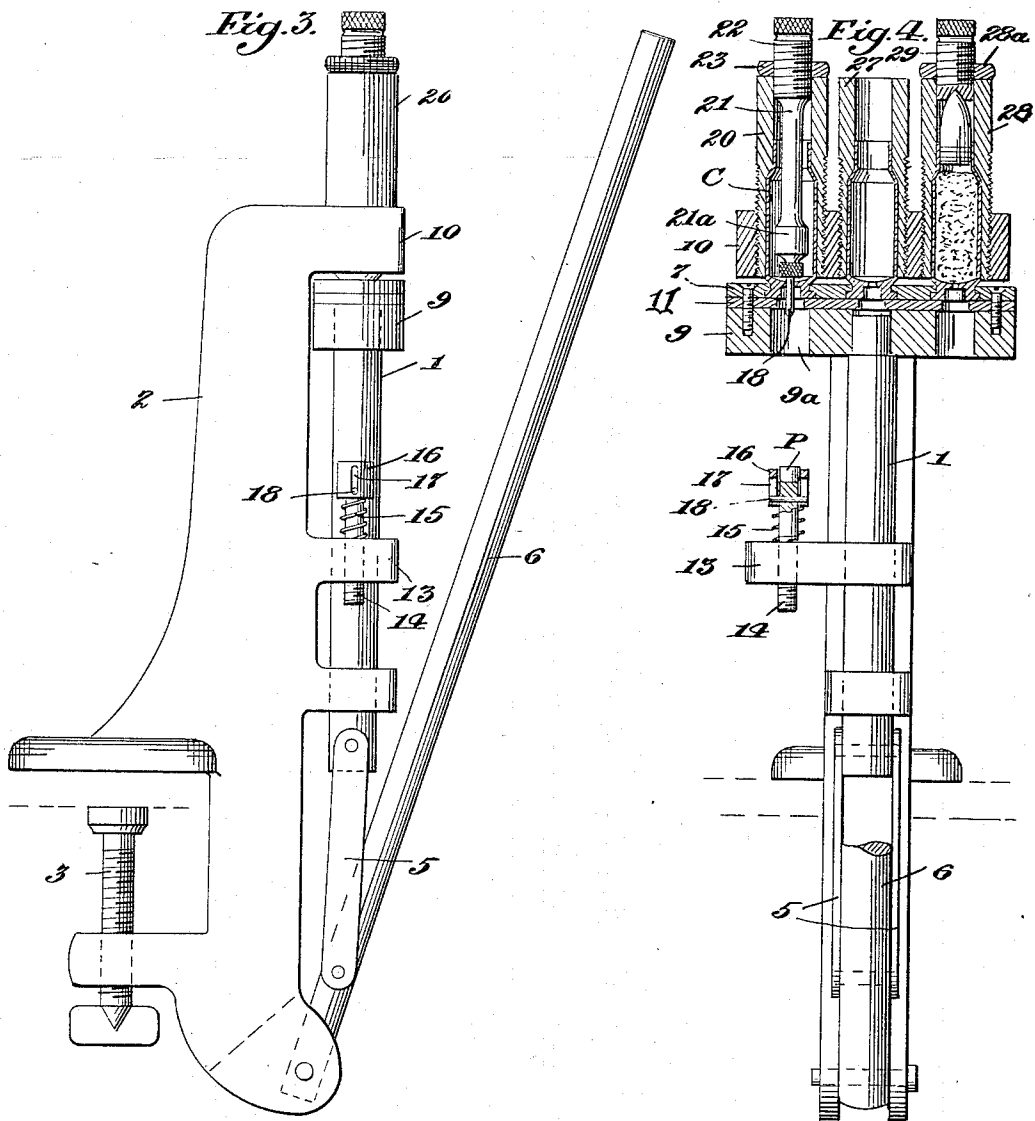
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RELOADING TOOL

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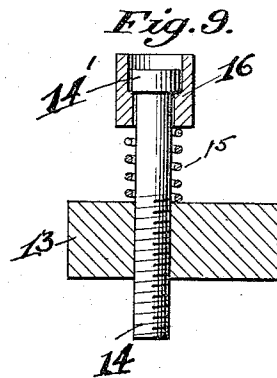
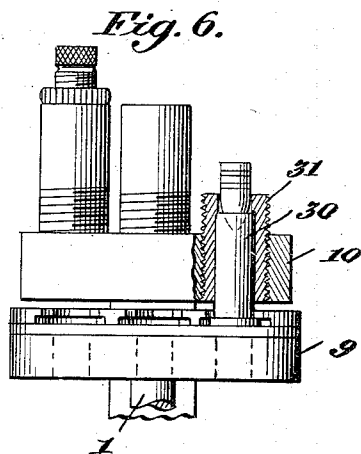
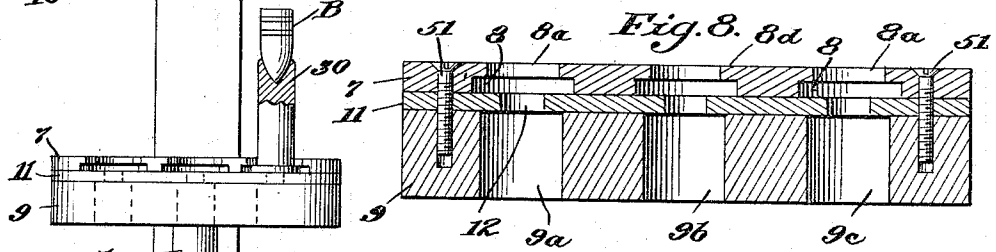
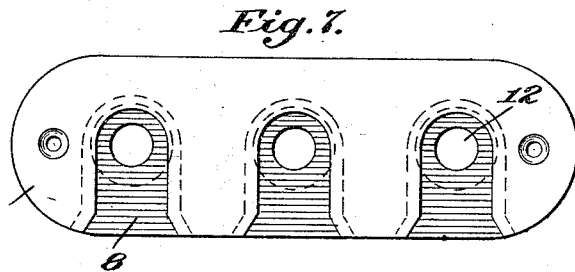
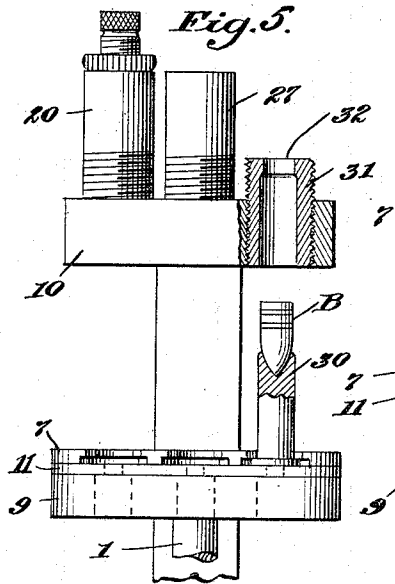
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RELOADING TOOL

Filed Feb. 15, 1932

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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RELOADING TOOL

Application filed February 15, 1932. Serial No. 593,141.

This invention relates to improvements in those tools or devices which are employed in performing the necessary operations involved in re-loading rifle or pistol cartridges. These operations consist in removing the old primer; inserting a new primer; re-sizing the outside or neck of the cartridge case; expanding the inside, and inserting and seating a bullet.

One of the objects of the invention is to provide an apparatus or tool of the type described which performs the above operations, in sequence, by a single reciprocation of an operating member.

Another object of the invention is to provide an improved re-loading tool which comprises a minimum number of parts, so constructed and organized as to accomplish the necessary operations with the expenditure of a minimum amount of labor and in a short time.

Another object of the invention is to provide improved mechanism which may be operated to remove the primer from one shell while operating upon other shells to perform additional operations, such as re-sizing the entire shell, and inserting a bullet in position upon a shell which has been charged with powder.

Other objects and advantages of the invention are more fully set forth in the following description, and will be understood therefrom in connection with the accompanying drawings illustrating apparatus for carrying into effect the various purposes of the invention, and the novel features will be pointed out in the appended claims.

In the drawings:—

Fig. 1 represents a tool embodying the invention in side elevation, partly in section;

Fig. 2 is a front elevation thereof;

Fig. 3 is a side elevation showing the parts in different positions from Fig. 1;

Fig. 4 is a view in front elevation, partly sectional;

Fig. 5 and Fig. 6 illustrate different positions of the lead bullet re-sizing attachment;

Fig. 7 is a plan view of the cartridge holding support;

Fig. 8 is a longitudinal section of the same, and

Fig. 9 is a detail, partly sectional, of an alternative primer cup construction.

The frame 2 is provided with a foot-piece 4, and a clamping screw 3, which latter is threaded through a lug in the frame, and serves together with the footpiece as a means for clamping the frame to a suitable support as a bench, such as indicated by dotted lines in the drawings.

The frame 2 is provided with projections, 13, 13a, which have perforations for guiding a plunger 1 for reciprocating movements. The plunger 1 may be reciprocated by a lever 6, connected with the plunger by suitable links 5, or otherwise as desired, in order that the plunger may be given its working stroke in the performance of the various operations of the tool. A bar 9 is rigidly secured upon the upper end portion of the plunger. This bar is herein shown as provided with three openings, 9a, 9b, 9c, and a plate 11 having restricted openings 12 therein is supported upon the block, the openings 12 being in alignment to the openings 9a, 9b, 9c through the block, but of smaller size than said openings. An upper plate or cartridge holder 7 is supported upon the plate 11, the parts 7, 11 and 9 being herein shown as securely fastened together by screws 51. The plate 7, which will hereinafter be referred to as the cartridge holder, is provided with three openings 8, which are in alignment with the three openings 12, and lead to the front edge of the cartridge holder. Said plate 7 is provided with smaller slots 8a arranged above the openings 8, and communicating with the front edge of the cartridge holder, as shown in Fig. 7. The parts just described are capable of supporting three cartridge cases or shells, which latter are inserted in the openings 8, 8a by movement from the front towards the rear, the flanges of the cartridge cases being retained by the overhanging flanges or ribs 8d, as shown.

The frame 2 is provided with an overhanging projection or head 10 arranged in alignment with the cartridge holder 7, and serving to support various implements for performing the several operations incident to

re-loading cartridges. The die 20 for re-sizing the shells is provided with an external screw thread which engages an internal thread in the head 10, and is interiorly formed to re-size the outside of the neck of a cartridge case. An inside expander 21 is provided with a thread 22 which engages a thread in the die 20, and is held in adjusted position therein by a lock nut 23. The expander 21 is provided with an enlarged head 21a to perform the expanding operation. As herein shown, a de-capping pin 18 is threaded to the lower end of the head 21a and projects downwardly through the openings 8, 8a and 9a, in the cartridge holder and its shell retaining plate, as shown in Fig. 4.

In line with the die 20, a second die 27 is herein shown as threaded to the head 10, and formed interiorly of such size and shape as to re-size cartridge cases for their full length, instead of merely re-sizing the necks thereof. In horizontal alignment with the two dies 20, 27, is a bullet-seating die 28, which likewise is threaded to the head 10. This die is provided with a bullet-seating screw plug 29 threaded in the upper end portion of the bore of the die 28, and held in adjusted position thereon, by a lock nut 28a, as shown in Fig. 4.

The projecting portion 13 of the frame 2 is herein shown as provided with an opening which receives by threaded engagement a stem 14 which supports the priming cup 16 for holding a primer P, as shown, the cup being provided with slots 17 through which passes a pin 18 carried by the stem 14, whereby the cup 16 is capable of limited reciprocating movements on the stem. A spring 15 on the stem is confined between the cup and the projecting arm 13 of the frame, and normally urges the priming cup into its upper position. In this position the cup will partially enclose the primer, which latter rests upon the end of the stem 14. The primer cup is in alignment with the opening 9a in the bar 9, and occupies a position for inserting a primer in an empty case when the bar is moved from its upper position, as shown in Fig. 4, to the lowered position as shown in Fig. 1. When the parts occupy the latter position the cartridge case C has been de-capped, re-sized as to its neck, and expanded internally, and is thereby in condition to receive the new primer which is inserted therein at the termination of the down stroke of the bar 9.

The die 27 which is formed interiorly to re-size the cartridge case for its full length, may if desired, be substituted for the die 20, in which case the operations performed by the latter and the expander and de-capper will not be changed, but instead of re-sizing merely the neck of the shell, the shell will be re-sized for its full length.

Fig. 4 shows how the bullet-seating die 28

and its plug 29 are employed for seating the bullet in the restricted portion or neck of the case after the latter has been supplied with its appropriate charge of powder, and this operation follows the previously described operations upon the case, and may be performed on one cartridge case while another case is being subjected to the de-capping, and re-sizing operations.

It will be seen from the foregoing that by supporting the several dies which are instrumental in the performance of the functions described in the head 10, in conjunction with the re-capping or primer-inserting device at the opposite end of the stroke of the head 10, a plurality of operations may be performed upon a number of cases, and all of these operations may be carried out by a single reciprocation of the plunger.

In Figs. 5 and 6 of the drawings is illustrated a re-sizing die for lead or cast bullets, which comprises a bullet sizing die 31, herein shown in the form of a hollow bushing which is threaded into one of the apertures in the head 10, and provided with a restricted opening 32, and a cooperating punch 30 carried by the reciprocating bar 9, and aligning with the bore on die 31. When the bar 9 is in its lowered position, Fig. 5, a cast bullet B with its point downward is placed in a recess in the punch 30 shaped to fit the pointed end of the bullet. When the bar 9 moves upwardly to the position shown in Fig. 6, the bullet is reduced to its proper diameter by being forced through the restricted bullet-sizing die-opening 32.

Adjustment of the various dies, as 20, 27 and 31, in the head 10, in order to position them properly relatively to the shell case, or in the re-sizing of cast bullets to the bullet, may be readily accomplished through the threaded connections between these dies and the head, as is obvious.

It will be observed that the openings 12 in the plate 11 are smaller in diameter than the openings 8a in the holder 7, the relative size of these openings being such and the recess in the cartridge case which receives the primer being slightly less in diameter than that of the opening 12, that the shell case is supported upon the plate 11 in such manner that the primer may be inserted as the head descends and passes over the cup 16 without interference, the upper edge of the latter engaging with the lower surface of the marginal portion of plate 11 immediately surrounding the opening 12. By this engagement between the upper edge of the cup 16 and the plate 11, the cup is depressed against the stress of spring 15 which yields and permits the primer to be seated firmly in the primer recess in the base of the case, it being observed that the cup surrounds the primer upon the end of the stem 14 and prevents its accidental displacement during that portion

of the descent of the bar 9 previous to the engagement between the edge of the cup 16 and the plate 11.

In the performance of the various operations described it will be seen that an empty cartridge case is moved into the opening 8 while the bar 9 is in its lowered position, as shown in Fig. 1. Upward movement of the lever 6 and plunger 1 causes the bar 9 and the empty case (or cases) to move upward, the case which is in alignment with the die 20 being de-capped by the primer pin 18 at or about the same time that the neck of the case enters the restricted upper portion of the die and is re-sized by external engagement therewith. Upon a reverse movement of the bar, the shell is withdrawn from the die 20, and the expander head 21 acts to expand the neck to its proper size. In the meantime a primer has been placed in the cup 16, and upon continuation of the downward movement of the bar 9, the primer is caused to be firmly seated in its recess in the base of the case. The shell is then filled with the appropriate amount of powder, the cartridge case is inserted in the opening 8 of the holder 7 which is in alignment with the bullet-seating die 28 and a bullet is placed over the mouth of the case. Upon upward movement of the plunger 1 this cartridge case and bullet are then moved into die 28 and the bullet by engagement with the screw plug 29 is properly seated in position and permanently held secure as the neck of the case has previously been re-sized to such size as to hold the bullet friction tight. If it is desired to crimp the case this may be accomplished by having die 28 adjusted to cause such pressure between the edge of the neck of the case and the bullet as to crimp the case around the bullet.

In Fig. 9 the stem 14 is provided with an enlargement or head 14', and the cup 16 is provided with two bores of different internal diameters, thus producing a shoulder. When the cup is projected to its upward limit by the spring 15 as shown in Fig. 9, it is arrested by engagement of the head 14 with the shoulder formed at the junction of the enlarged and restricted bores. In this form the slot and pin arrangement disclosed in Figs. 1, 3 and 4 is unnecessary. Either form of stem and cup may be employed, as desired.

The right is reserved to make such changes in the details of construction and the arrangement of the parts herein shown as are contemplated by the scope of the following claims.

I claim:—

1. In a device of the character described, the combination of a support carrying a plurality of dies, one of said dies being shaped to re-size a cartridge case, means in said die for de-capping the case when the same enters the die, means for expanding the neck of the case when the latter is retracted, means

for re-capping the case as it is withdrawn from said die, a case holder, and means for causing relative movement between said holder and said die and re-capping means.

2. In a device of the class described, the combination of a support for a plurality of dies which are constructed, respectively, to perform successive operations upon a cartridge case, one of said dies constructed and arranged to re-size and to eject a primer from a case and another of said dies having means for seating a bullet upon a re-sized and re-capped case, means for supporting a plurality of cartridge cases and for moving them simultaneously relative to said dies to perform the respective operations of the latter, and a re-capping device located upon the opposite side of said support from the side on which said dies are located, whereby upon one stroke of the support a case may be re-sized and de-capped while another case is having a bullet seated therein, while upon the reverse stroke one of said cases is being re-capped.

3. In a device of the class described, the combination of a frame, a head thereon carrying a plurality of dies, one of said dies being adapted to re-size a case externally and having means for de-capping the case upon the same movement of the shell thereinto, and means for expanding the case upon reverse movement of the latter, another of said dies having means for seating a bullet in a case, a support for a plurality of cases arranged to cause said cases to enter said dies upon one movement of the support, and means for re-capping a case upon the reverse movement of said support.

4. In a device of the class described, the combination of a frame having a head with a plurality of dies therein, one of said dies shaped to re-size a cartridge case upon movement of the case in the die and means for simultaneously de-capping the case and having means for expanding the neck of the case upon outward movement of the latter, the other of said dies having means for seating a bullet in a case upon movement of the case into said die, means for supporting a plurality of cartridge cases and for imparting the necessary movement thereto to cause said cases to enter the dies, and means for re-capping one of said cases upon reverse movement of said supporting means.

5. In a device of the class described, the combination of supporting means for a die, of a die constructed to re-size a cartridge case externally upon movement of a case in said die, means for expanding the case internally upon reverse movement of the case, a support comprising a bar having an undercut opening therein constructed to hold a cartridge case by its flange, said bar including supporting means having an opening of larger diameter than that of the primer recess

in the case and additionally having an opening of still larger diameter than the first-mentioned opening to receive a primer cup, means located in line with the last-named opening to sustain a primer, a yieldingly supported cup arranged to be normally held in advance of said primer support said cup being of a size to enter the larger opening in the case-supporting bar but having its peripheral advancing edge of larger diameter than the first-named opening in said bar whereby said cup may upon relative movement of the cup and bar be caused to engage the annular projecting portion surrounding the restricted opening and be moved relatively to the primer support to permit a primer to be forced into the recess in the base of the cartridge case.

6. In a device of the class described, the combination of a frame, a cartridge case resizing die adjustably mounted in said frame, means in said die for internally expanding a case, means carried by the expanding means for de-capping a case, a support having an undercut recess for engaging the flange of a case, supporting means for the case having an aperture of greater diameter than that of the primer receiving recess, said case support being provided with still greater enlarged opening below the first-mentioned opening thereby providing an annular shoulder within the case support, a stem adjustably and rigidly mounted in alignment with the last-named opening, a primer cup reciprocally mounted upon said stem, yielding means for advancing the cup beyond the upper end of the stem, said cup being of a diameter to engage the rim surrounding the smaller opening in the case support and arranged to be moved relatively to the stem, and means for relatively moving said support and primer cup towards each other to effect seating the primer in the recess in the case.

7. In a device of the class described, the combination with a holder having a supporting plate for a cartridge case, said plate provided with an opening of a size larger than the primer receiving recess and adapted to be arranged therebelow, said holder having an opening of larger diameter than the opening in said plate and arranged below the latter, a primer support arranged below and in line with said openings, a cup surrounding said primer support and yieldingly sustained above it, said cup being of a size to enter the larger opening in the holder, but of larger size than the opening in said plate, and means for causing relative movement between said holder and primer support.

8. In a device of the class described, the combination of a frame having a head thereon with means for supporting adjustably a plurality of dies, one of said dies being constructed and arranged to re-size a cartridge case and de-cap the same upon one movement

of the case, and having means to expand the case upon reverse movement of the latter, and another die being constructed to seat a bullet in a case, a reciprocating plunger, means for guiding the same, a cross bar carried by said plunger and having a plurality of openings therein with flanges to retain a plurality of cartridge cases in line, respectively, with said dies, a plate on said bar having a plurality of openings arranged to be in line with cartridge cases when sustained on said bar and of greater size than the openings in the base of the cases which receive primers, a primer supporting stem rigidly sustained below said bar and in line with one of the openings there-through, and a primer cup yieldingly supported on said stem and normally held in advance of the extreme end of said stem, said cup being of larger diameter than the opening in said plate.

In testimony whereof I have hereunto set my hand this 22nd day of January, A. D. 1932.

GEORGE F. ZIMMERMAN.