Nov. 17, 1964 T. J. BACHHUBER 3,157,086

SHOTGUN SHELL RELOADER

Filed Jan. 18, 1962

4 Sheets-Sheet 1

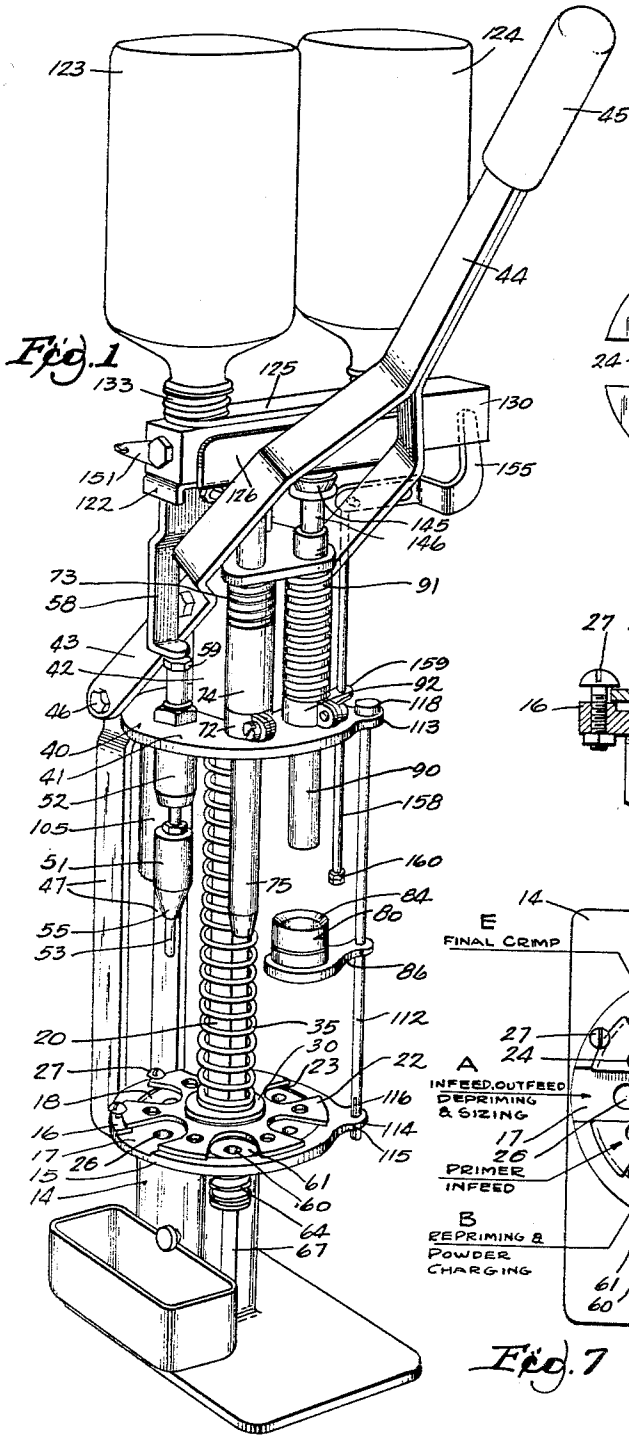


Fig. 1

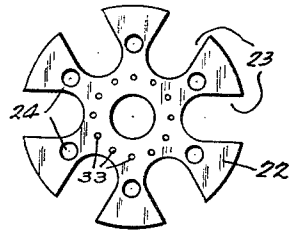


Fig. 9

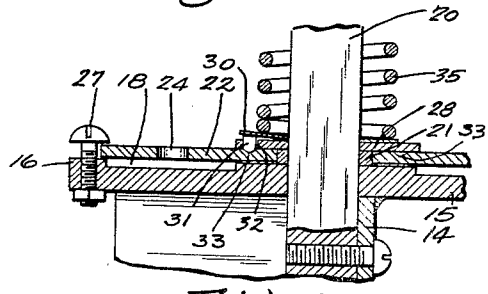


Fig. 8

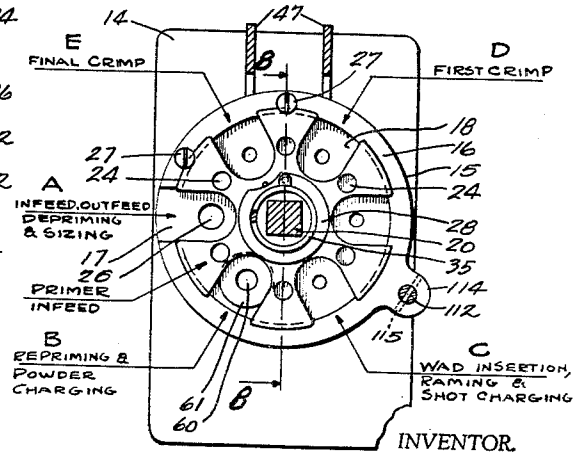


Fig. 7

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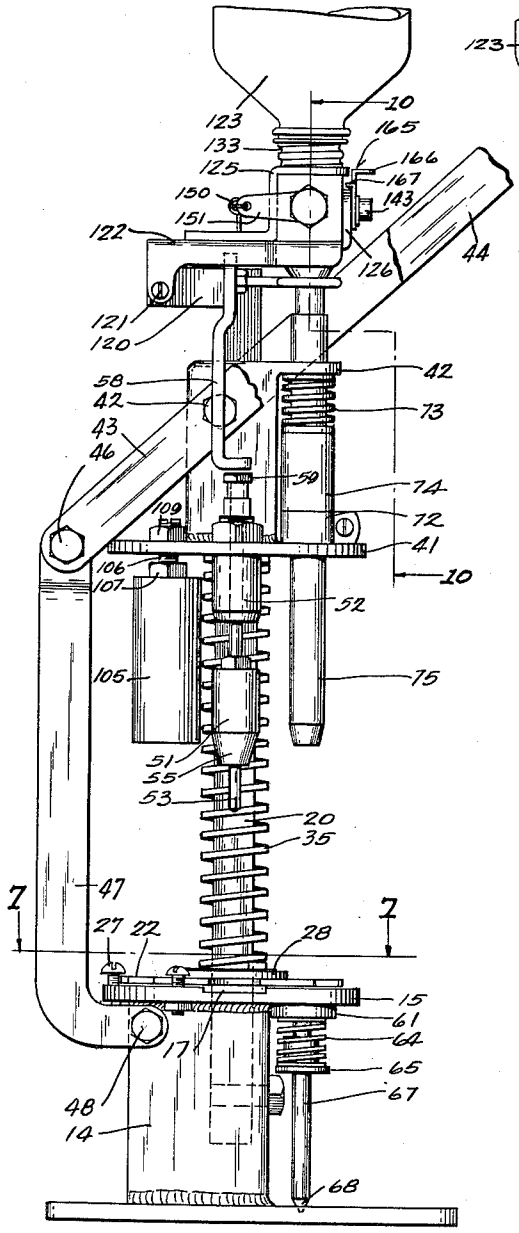


Fig. 2

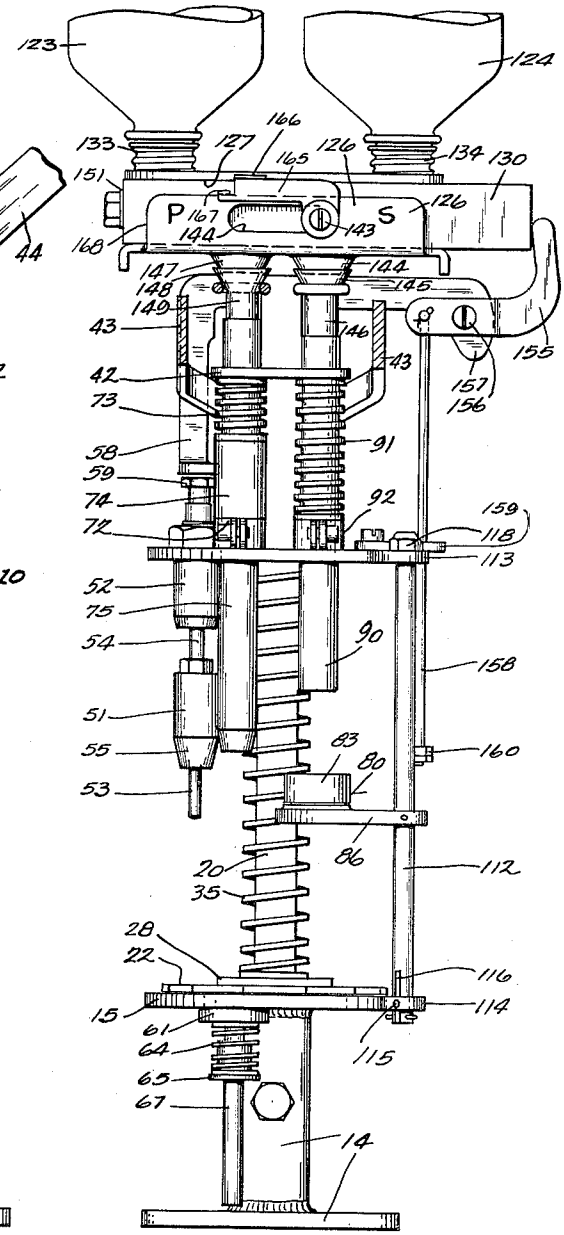


Fig. 3

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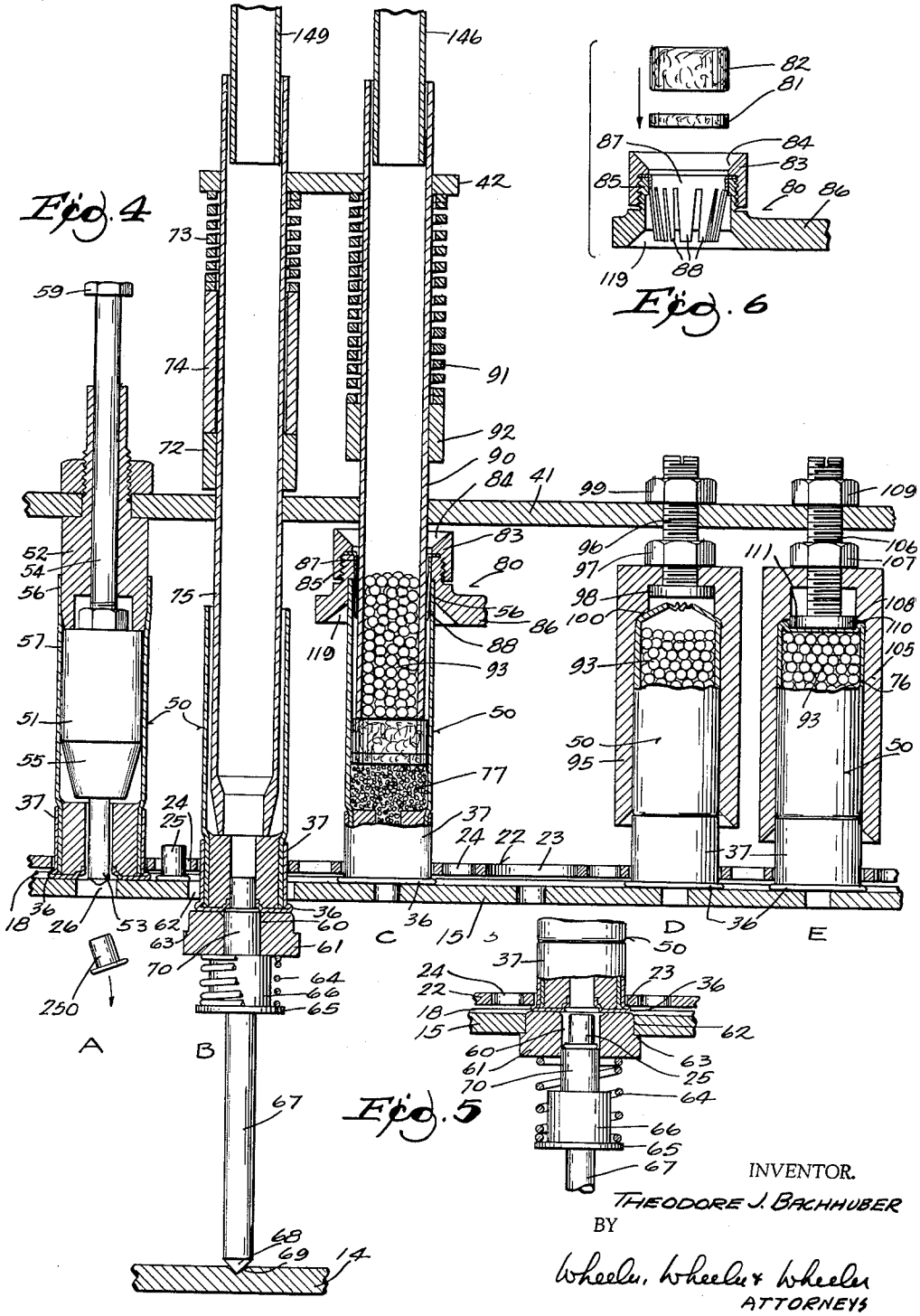


Fig. 4

Fig. 6

Fig. 5

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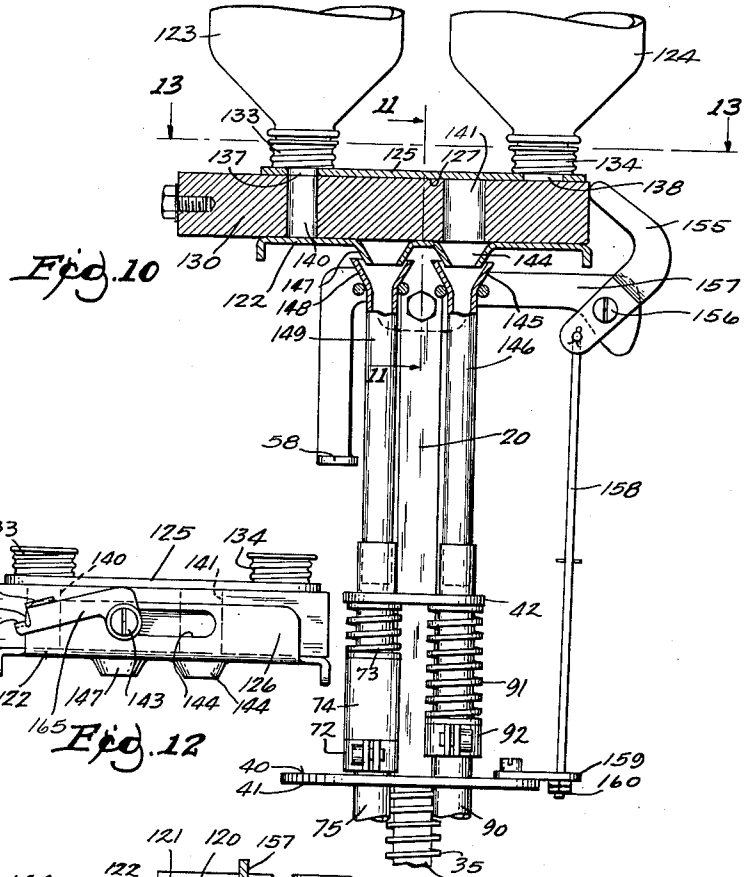


Fig. 10

Fig. 12

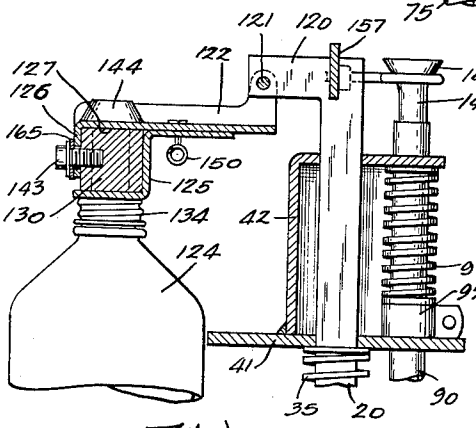


Fig. 11

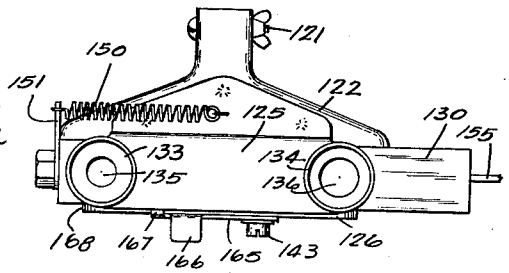


Fig. 13

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3,157,086
SHOTGUN SHELL RELOADER

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Filed Jan. 18, 1962, Ser. No. 167,129
13 Claims. (Cl. 86—27)

This invention relates to a shotgun shell reloader.

The invention is an improvement on that disclosed in my copending application 803,754, filed April 21, 1959, now Patent No. 3,105,408.

In the instant device, the shells to be reloaded are placed successively upon a table to be indexed step by step past an annular series of tools. The advance is turret-controlled and manually actuated using one of the shells as a handle for the manipulation of the turret.

The several tools are mounted on a carriage reciprocated vertically by a hand lever which is manipulated alternately with the turret-controlled advance of the shells. The tools which successively function during the operation of the device includes, at a first station, a tool for punching out the used primer head and a tool for resizing the cardboard cartridge case. At a second station, there is a tool for inserting a new primer cap and for placing a charge of powder in the cartridge case.

At a third station, there is a tool for placing and ramming home a wad on top of the powder and for delivering a charge of shot upon the wad.

At other stations are dies which function successively, in the preferred embodiment, for recrimping the cardboard cartridge case above the shot. With the device in normal operation, every indexing operation of the turret will move an empty shell into position to receive a primer cap and a charge of powder and will deliver a re-filled shell into position for removal from the device.

An important feature of the present invention consists in separate drop tubes for powder and for shot and a connection whereby a valve controlling powder and shot delivery is operated mechanically as in incident to the manual actuation of the tool carriage.

In the drawings:

FIG. 1 is a view in perspective of a shell reloading device embodying the invention.

FIG. 2 is a view showing the device in side elevation.

FIG. 3 is a view showing the device in plan.

FIG. 4 is a diagrammatic developed view partially in elevation and partially in section showing the various tools as they operate concurrently upon different shells in successive loading stages.

FIG. 5 is a fragmentary detail view partially in elevation and partially in section showing the position of some of the parts at the second stage prior to the point at which they reach the position of FIG. 4.

FIG. 6 is a fragmentary detail view partially in elevation and partially in section showing some of the component parts as they appear at an intermediate stage before reaching the position in which they are illustrated in FIG. 4.

FIG. 7 is a view in horizontal section on the line 7—7 of FIG. 2.

FIG. 8 is a view on an enlarged scale taken in section on the line 8—8 of FIG. 7.

FIG. 9 is a detail view of the turret disk in plan.

FIG. 10 is an enlarged detail view partially in section

and partially in elevation on the line indicated at 10—10 in FIG. 2.

FIG. 11 is a detail view taken on the line 11—11 of FIG. 10 with the shot containers in inoperative position.

FIG. 12 is a fragmentary detail view in front elevation showing the metering slide valve way in front elevation with the slide valve locked open.

FIG. 13 is a fragmentary detail view in plan of the container indicated at 13—13 in FIG. 10, the powder and shot containers being removed.

The base 14 supports a table 15 having an annular rim 16 interrupted by a slot 17 which admits the rim 36 of a shell into the annular channel 18 elsewhere enclosed by rim 16 as shown in FIG. 1 and FIG. 8.

A column or post 20 is mounted on base 14 axially of the table 15 and encircled by a collar 21 upon which turret disk 22 is rotatable. The turret 22 has radial slots 23 corresponding in width to the diameter of the brass ferrules 37 of successive cartridges to be refilled. The beads of the shells are confined by the turret to the table channel 18. Between these slots are openings 24 sufficiently large to receive primer caps 25, which are manually inserted therein and rest on table 15 as shown in FIG. 4, to be propelled by the turret disk 22. At 26, the table 15 has a hole of sufficient size so that a spent primer cap 250 can be discharged therethrough.

In order to hold down the margins of the turret disk to keep it parallel with the table and to draw the successive shells from the tools acting thereon, the table rim 16 is provided with one or more screws 27 whose heads overlie the margin of disk 22 as shown in FIG. 7 and FIG. 8. It will be understood that the slots 23 of the turret disk are dimensioned to fit the shell ferrules snugly above the beads or rims thereof so that any tendency of the shell to be lifted with the tool engaged therein will be resisted by disk 22 as held down by the heads of screws 27.

Detent means is provided for indicating tangibly to the operator the various positions of advance of the turret disk 22. A detent plate 28 has a square opening to fit the post 20 and upon it rests a flexible disk 30 carrying a rounded pin 31 projecting through an opening 32 in plate 28 as shown in FIG. 8. The detent pin 31 engages in successive pockets 33 of the turret 22. As shown in FIG. 9, there is a pocket 33 on the central radius of each of the radial slots 23 and there in one intervening pocket between each pair of such slots. A compression spring 35 which encircles the post and yieldably supports the tool carriage hereinafter to be described seats at its lower end upon the flexible disk 30 to engage the detent pin 31 in the successive pockets. Since the screws 27 hold the turret disk at one side only, a defective shell can be removed at any other point by lifting it out of channel 18, tilting the free margin of disk 22 upwardly against the pressure of spring 35.

The turret can be rotated only by camming the detent pin 31 from the socket in which it is engaged and it enters the next socket with a readily perceptible snap action to define the corresponding turret position. The manner in which the turret is rotated will be described hereinafter.

The carriage 40 comprises a tool carrying plate 41 reciprocable on the post 20 and urged upwardly upon the post by spring 35. Pivoted to the bracket 42 on carriage 40 are the links 43 of a bifurcated lever 44 having a handle

45. The ends of the lever remote from the handle are pivoted at 46 to links 47 which, in turn, are pivoted at 48 to the base 14. Most of the tools hereinafter described are mounted on the tool carrier plate 41 to be moved by lever 45 into operative engagement with the several shells and returned from such engagement by spring 35.

The various operative stations at which the shells to be reloaded are positioned under control of the turret 22 are indicated by reference characters A, B, C, D and E in FIGS. 7 and 4 and the stations at which operations occur are identified by legends in FIG. 7. There is one station between stations C and D in which, in the instant device, no operation on the work is effected.

At station A, a newly inserted empty shell generically designated by reference character 50 is centered over the hole 26 in the table and is beneath a tool which includes sizing dies 51 and 52 and a punch 53 for ejecting the spent primer cap 250 through the hole 26. For reasons having no relation to the present invention, only the sizing die 52 is fixed in carriage 41. Sizing die 51 and punch 53 are mounted on a headed rod 54 for limited independent movement, although, as they perform their functions, they are pushed by sizing die 52 and are functionally unitary therewith. The tapered end 55 of sizing die 51 opens up the previously crimped end 56 of the paper case 57 of shell 50. The slightly greater diameter of die 52 further expands the open end of the carriage case as the punch 53 ejects the primer as shown in FIG. 4.

While the operator is manipulating the handle 45 to lower the carriage 40 in the performance of these functions, he is placing with his left hand a new primer cap 25 in one of the openings 24 of turret disk 22. This is also shown in FIG. 4. Carriage 40 is then retracted by spring 35 and lever 44 to withdraw sizing dies 51, 52 from the cartridge case 57 of the shell 50.

A stop 58 in the path of the head 59 of rod 54 requires the rod and the sizing die 51 and punch 53 to move to the position shown in FIG. 3 independently of the sizing die 52 fixed to the carriage. This, however, has no relation to the present invention. As already explained, die 51 and punch 53 move unitarily with the carriage in performance of the functions herein disclosed.

With the carriage elevated to the position shown in FIGS. 1, 2 and 3, the operator will rotate the turret 22 to advance the turret and all the shells in the slots thereof to register the shell 50 which was de-capped at station A in its new position at station B. As a convenient means of bringing about this advance, the operator may grasp the reloaded shell which has been at station E, from which it is withdrawn radially through the channel 17 preliminary to the insertion of an empty shell for reloading.

In each movement of the turret from station to station, the detent pin 31 will be operated twice. The first operation occurs when the live primer cap 25 is moved one-half step from the position of primer infeed indicated by the legend in FIG. 7 and by the illustration of the primer cap 25 in FIG. 4.

The pause or hesitation of the turret resulting from this intermediate operation of the detent facilitates the dropping of the live primer cap 25 into a socket 60 in the annular shell support 61, which is normally engaged in an aperture 62 of table 15 as shown in FIG. 5. The shoulder 63 on the support 61 defines its normal position to which it is urged by the bias of spring 64. This spring is carried by a spring seat 65 on a sleeve 66 fixed to a post 67 having a pointed end 68 normally engaged in a socket 69 in base 14. The readily detachable positioning of the post 67 on the base facilitates removal of the annular shell support 61 for cleaning.

The upper 70 of post 67 constitutes an anvil or die for forcing the live primer cap 25 into position in the base of the shell registered therewith at station B. As the carriage 41 is urged downwardly by lever 44, as above described, a tubular ram 75 enters the case 57 of the shell 50 to force the entire shell downwardly onto the primer cap 25 which was dropped into the opening 60 and is supported therein on the anvil or ram 70. Under the pressure of the descending ferrule of the shell, the annular support 61 yields against the bias of spring 64 to lower the shell but the fixedly supported primer cap 25 does not yield and therefore is forced into the desired position in the shell. As is clearly apparent in FIG. 4, the support 61 is completely disengaged from the opening 62 of table 15 when downwardly displaced by the ram. This is important because any powder or other foreign matter which might accumulate on the table is free to discharge through opening 62 in the course of this operation. When the ram is withdrawn, the spring 64 returns the support 61 into the opening 62 of the table until the shoulder 63 engages the under surface of the table as already described.

The tubular ram need not be fixed to the carriage with the precision necessary to determine the proper seating of the primer cap 25, since the tubular ram is also yieldable. It is reciprocably mounted in the carriage 41 and a portion of the bracket 42. A clamp collar 72 adjustably engaged with the tubular ram 75 normally rests on the carriage 41 to determine the initial position of the tubular ram. A relatively heavy compression spring 73 between the bracket 42 and spacer 74 exerts a downward bias through collar 72 upon the tubular ram which is sufficient to effect the proper seating of the cap within the shell but will nevertheless accommodate the yielding of the tubular ram 75 when the primer cap is seated, in the event the carriage moves beyond that point.

As the carriage is being retracted to its upper position following the seating of the primer cap, a charge of powder is dropped through the tube 75 into the shell 50 at station B. The means by which this is accomplished will be described hereafter. The charge of powder is shown at 77 in the shell which is in registry with station C in FIG. 4.

It will be understood that in the normal use of the device the same movement of the carriage which has inserted a live primer cap 25 at station B has also discharged a spent primer cap 50 from another shell at station A in the manner already described. These shells, and those previously acted upon by the reloader, are now indexed another step by rotation of the turret disk 22 so that the shell 50 which has received a charge of powder 77 at station B is now located at station C.

At station C, the shell 50 containing the powder charge 77 is centered beneath a device, generically designated by reference character 80, for supporting and feeding a wad or wads 81, 82 (see FIGS. 1, 3, 4 and 6). Ring 83 has a bevel at 84 to receive the wads and it is threaded to a boss 85 on a supporting arm 86 which carries an annular guide 87 which, in accordance with known practice, has resiliently flexible and normally convergent fingers 88 of thin metal. In the instant device, the wad or wads 81, 82 are placed manually in the pocket provided by bevel 84 of ring 83. When the carriage 41 descends, a tubular ram 90 mounted on the carriage engages the wad or wads forcing these through the guide 87 and the flexible fingers 88 which have entered the upper end 56 of the shell case 57. Thus the wads are driven into the shell case and forcibly engaged with the powder charge 77 as shown in FIG. 4.

The tubular ram 90 is yieldable respecting the carriage, being reciprocable through the carriage and the bracket 42 against the bias of a compression spring 91 acting between the bracket 42 and a collar 92 fixed to the tubular ram.

As the carriage 41 is being retracted following this operation, a charge of shot 93 is dropped from the tubular ram 90 into the shell. The charge is in the tube 90, not yet having been released into the shell in the position of the parts shown in FIG. 4, but the charge of shot 93 is shown in the shell 50 which is at the next

station D in FIG. 4. The means whereby the shot is caused to drop into the ram tube 90 will be described hereinafter.

At stations D and E, the crimp is restored to the previously open end portion 56 of the tubular cardboard case of the shell 50. For a more perfect crimp, it is preferred to use two crimping dies rather than one. The crimping die 95 is mounted in fixed position on the stud 96 by a nut 97 threaded to the stud and serving to clamp the die to the head 98 of the stud. The stud itself is threadedly adjustable respecting carriage 41, being held in adjustment by a lock nut 99. The shoulder portion 100 of the die forms the initial crimp when the die descends over the shell case 76.

At station E, a previously refilled and partially re-crimped shell is receiving a final crimping operation by means of the die 105. This die is slightly longer than the die 95 and it is mounted on a somewhat longer stud 106 with a head 110 within the die. The stud 106 is threaded in die 105 and held in adjustment by a lock nut 107. The stud itself is threadedly adjustable in the carriage 41 and locked in position by lock nut 109. Its shoulder 110 engages the partially crimped shell case 76 to clamp the crimps. The head 108 is forced against the crimps to compress and seal them, forming a slight depression 111 in the closed end of the shell. This completes the reloading operation and, as already explained, the operator will normally index the turret 22 and the shells positioned thereby when he grasps the loaded shell at station E to index it with the turret to station A for removal.

Reference has been made to the wad-supporting and guiding device 80 and the arm 86 which carries the device. This arm is pinned to a rod 112 as best shown in FIGS. 1 and 3. Rod 112 is reciprocable in an ear 113 of the carriage 41 and a corresponding ear 114 of the table. A pin 115 in ear 114 engages in slot 116 to keep the rod 112 from rotating, whereby the wad carrier 80 is maintained in proper registry with station C. To limit downward movement of rod 112, a head 118 at the upper end of the rod normally rests on the ear 113 to limit the gravity-biased downward movement of the rod.

When the carriage 41 descends and the spring fingers 88 enter the open end of the shell case, the shell case may engage the bevelled surface 119 of arm 86 (FIG. 4). The lost motion provided by the limited freedom of movement of the rod 112 gives time for the shell case to adjust itself for final seating in the socket of arm 86 as shown in FIG. 4 before the descending ram 90 pushes the wads 81, 82 into the shell case.

The arrangement for delivering powder and shot into the shell during the retraction of the carriage will now be described.

Column 20 is provided at its upper end with an arm 120 as best shown in FIG. 11. Pivoted thereto at 121 is the arm 122 which supports the powder container 123 and shot container 124. A separate portion 125 of arm 122 is complementary to a flange 126 on the arm to provide a way at 127 in which a metering slide valve 130 is reciprocable. The portion 125 of arm 122 carries a pair of apertured caps 133 and 134 which are screwthreaded for detachable connection of the containers 123 and 124 therewith. The apertures 135, 136 of the respective caps register with apertures 137, 138 of the member 125 at the top of the way 127 in which the metering valve 130 is reciprocable. The valve 130 has metering cavities 140 and 141 which, in the course of valve reciprocation, may be registered with the openings 137, 138 of the way to receive powder and shot respectively from the containers 123 and 124.

A peg 143 is threaded into the slide valve 130 and operates in a slot 144 in the outer flange 126 of the way 127 to define the limits of reciprocation of the valve 130. FIG. 10 shows the valve 130 at one extreme of its reciprocable movement to the left. In this position, the powder metering cavity 140 registers with the opening 137 through which powder is delivered from container 123. Concurrently the shot metering cavity 141 is in registry with a funnel 144 whereby shot previously delivered into the cavity is discharged into the complementary funnel 145 of a drop tube 146 with which the tubular ram 90 is in telescopic association.

If the slide valve 130 is moved to the right to the end of the stroke permitted by the peg 143 in slot 144, this position being shown in FIG. 13, the cavity 141 will register with the opening 138 to receive a fresh charge of shot from container 124. At this time, the cavity 140 will be moved into registry with the funnel 147 to discharge therethrough the charge of powder previously received from container 123. Funnel 147 registers with the complementary funnel 148 of a drop tube 149 which is telescoped into the tubular ram 75 above described.

The reason the drop tubes are not fixedly connected with the way in which the slide valve 130 reciprocates is because it is advantageous to be able to pivot the entire way and the containers 123 and 124 mounted thereon to the position shown in FIG. 11, whereupon all charges of powder or shot drop back into their respective containers and the containers can readily be removed, right side up, without spilling their contents. Oscillation of the arm 122 and the containers from the position shown in FIG. 11 to the position shown in FIG. 10 will restore the operative relationship of funnels 147, 148 and 144 and 145 and will position the containers for gravity discharge of powder and shot into the metering cavities 140, 141 of the valve 130.

In the reloader disclosed in my previous application above identified, the metering valve was operated manually and independently of the rest of the apparatus. By using two drop tubes and reorganizing the slide valve and connecting it to receive motion from the carriage, I have made the functioning of the valve automatic.

A spring 150 is attached to arm 122 as shown in FIG. 13. This spring has an anchorage 151 to the end of valve 130 and biases the valve to the right as viewed in FIGS. 10 and 13. A bell crank lever 155 pivoted at 156 to a bracket 157 on column 20 bears against the end of the valve 130 and is actuated from carriage 41 by means of link 158 to force the slide valve from the position of FIG. 3 to the position of FIG. 10 against the bias of tension spring 150. The link 158 has lost motion respecting carriage 41, as will appear upon comparison of FIG. 3 and FIG. 10.

The metering valve is not operated until the descending movement of carriage 41 engages brackets 159 with the nut 160 at the lower end of link 158. The resulting reciprocation of the valve will register the shot cavity 141 with funnel 144 to discharge shot through the drop tube 146 and the tubular ram 90 while the ram is in its lowermost position, the ram gradually releasing the shot into the shell as it withdraws from the carriage in the upward reciprocation of carriage 41. Meantime a charge of powder will be picked up in cavity 140 through port 127 from container 123. As the carriage retracts from the position of FIG. 10 toward the position of FIG. 3, the valve 130 will be reciprocated to its alternate position by spring 150 to discharge powder from cavity 140 through the drop tube 149 and the tubular ram 75 before the ram leaves the shell. Both the powder and the shot are released into the shell during the retractive movement of the carriage, although the shot has fallen through its tubular ram 90 in the lowermost position of that ram, whereas the powder does not fall through its ram 75 until the ram 75 is already in course of retraction.

During the initiation of the loader sequence, it is desirable to be able to lock the metering valve in the position in which it has been advanced to the left against the bias of tension spring 150. For this purpose, a manually operable catch lever is provided at 165 (FIG. 12), being pivoted on the stud 143 which limits reciprocation of the metering valve 130. A thumb piece 166 on the

catch lever **165** facilitates manipulation thereof. A rearwardly projecting finger **167** at the free end of lever **165** can be engaged with the end margin **168** of flange **126** as shown in FIG. 12 to latch the metering valve **130** against spring-biased retraction.

In setting up the machine for continuous shell reloading operation, it is necessary to use the punch **53** to dislodge the spent primer cap **250** from the first shell inserted. At this time, there is no shell in station B or station C to receive either powder or shot. Accordingly, the catch lever **165** is used to lock the slide valve **130** out of operation temporarily. After the primer cap has been dislodged and the first shell is moved to station B where a live primer cap is available, the downward reciprocation of carriage **41** by means of lever **44** will position the live primer cap and the catch is then released so that the slide valve may discharge its powder and move to a position where it will receive a charge of shot into the cavity **141**. The device is now in the course of normal functioning.

Similarly, at the conclusion of a series of shell reloading operations, when the placement of empty shells has been terminated and all that remains is to crimp the reloaded shells at stations D and E, the slide valve **130** is again locked out of operation by the catch **165** to prevent powder and shot from being discharged onto the table at stations A and B.

During continued operation, the lever **44** is conveniently manipulated by the operator's right hand while, alternately with the actuation of the lever, and during carriage dwell, he uses his left hand to draw successive loaded shells from station E to station A for removal, thereby advancing all of the other shells with the turret disk **22**. With either hand, the operator places the live primer caps in the turret openings **24** successively exposed between stations A and B and with his left hand he inserts at station A an empty shell into the table channel **18** and the turret slot from which the reloaded shell has been withdrawn. The discharge of its spent primer cap and the re-sizing of its case occur at station A preliminary to the next turret advance.

I claim:

1. A shell reloading machine comprising the combination with a table having an annular channel and a rim notched to afford access to the channel, of a turret disk having means mounting it for rotation in a position spanning the channel and having slots successively registrable with the notch of the rim and such width as to receive and confine shotgun shells for the propulsion thereof about said channel, a carriage, means mounting the carriage for vertical reciprocation respecting the channeled table, and angularly spaced tools mounted on the carriage for reciprocation therewith to and from operative engagement with shotgun shells positioned by the turret disk, the slots of the turret disk being at an angular spacing corresponding to the spacing of said tools, the table being provided with a primer cap discharge opening in its channel opposite said notch and the turret disk having apertures of a size to receive and propel primer caps, such apertures being located intermediate the slots of the turret disk, together with means including an anvil punch beneath the turret disk, a yieldable table portion normally registering substantially with the bottom of the channel and adapted to lower respecting the punch a shotgun shell in registry therewith, one of the tools carried by the carriage comprising a ram for forcing a shotgun shell downwardly respecting the punch, the yieldable table portion having a socket registering with the punch and into which the punch enters when the yieldable table portion is forced downwardly by said ram and a shotgun shell on said yieldable portion, said socket being adapted to receive successive primer caps to be pressed by the punch into successive shells forced downwardly by said ram.

2. In a shotgun shell reloader, the combination with a table having a socket adapted to receive a primer cap and having a yieldable portion in which said socket is located, a spring opposing the yielding of said portion, and a relatively fixed anvil punch forming a bottom for said socket and with respect to which said portion is yieldable, means for advancing successive shells on said table into registry with said punch and supported on said yieldable table portion, and means for forcing downwardly respecting said punch a shotgun shell lacking a primer cap and supported on said portion in registry with said punch whereby a primer cap supported by the punch will be forced into position in said shell, said punch having a free end portion remote from the table and in further combination with means below the table with which the free end portion is detachably engaged, the yielding portion of the table being shouldered for table engagement to limit its upward movement in a direction away from said last means, the spring being provided with a first seat on the punch and with a second seat upon said yieldable table portion.

3. In a reloading device for shotgun shells having ferrules, the combination with a table provided with an annular channel defined by a circular rim discontinuous about the channel and having a notch opening laterally into the channel of sufficient width to receive the ferrule of a shotgun shell, a turret disk overlying the channel and having generally radial slots registrable with the notch in the course of disk rotation, means mounting the disk for rotation substantially coaxially with the channel, the disk being adapted to control the advance about the channel of shotgun shells admitted to the channel through said notch and in registry with successive slots of the disk, detent means for defining the several positions of the disk in which its respective slots register with the notch, and a tool carriage having tools with which shotgun shells positioned in the channel by the slots of the disk are in registry, and means for guiding said carriage for movement to and from the table for the interaction of its several tools with the several shotgun shells registered therewith, a spring biasing the carriage and tools away from the channel table, the means mounting the disk for rotation comprising a post rising above the table and encircled by said spring, the detent means including a seat for said spring, and said spring serving to activate the detent as well as to bias the carriage and tools.

4. A shotgun shell reloader according to claim 3 in which the spring seat of the detent means comprises a member encircling the post, the detent means including a pin connected with said member and for which said turret disk has complementary sockets.

5. A shotgun shell reloader comprising a work support for shotgun shells and a tool carriage reciprocable to and from the support, means for effecting relative movement between the tools and the shotgun shells on the support in a direction to advance shotgun shells into registry with successive tools, two of said tools comprising tubular rams, containers for powder and for shot, feeding means for metering powder and shot into the respective rams for delivery therethrough into shotgun shells with which the rams are in registry, a handle and motion transmitting connections including means for actuating both the carriage and the metering means from said handle, said actuating means including means for transmitting motion to the metering means in a direction for delivery of the powder into a shotgun shell during the retraction of said carriage and the tubular ram through which the powder is delivered from the shotgun shell into which delivery is made.

6. A shotgun shell reloader comprising a work support for shotgun shells and a tool carriage reciprocable to and from the support, means for effecting relative movement between the tools and the shotgun shells on the support in a direction to advance shotgun shells into registry with successive tools, two of said tools comprising tubular

rams, containers for powder and for shot, feeding means for metering powder and shot into the respective rams for delivery therethrough into shotgun shells with which the rams are in registry, a handle and motion transmitting connections including means for actuating both the carriage and the metering means from said handle, the motion transmitting connections aforesaid including spring means for biasing the feeding means in one direction and a thrust member for actuating the feeding means in the opposite direction against the bias of the spring means, the thrust member having a linkage connection with the carriage and the carriage having means for manually reciprocating it in one direction and having a spring biasing it for movement in an opposite direction.

7. A shotgun shell reloader according to claim 6 in further combination with means for locking the feeding means in one of its positions from which it is biased by its spring means.

8. A shotgun shell reloader comprising a work support for shotgun shells and a tool carriage reciprocable to and from the support, means for effecting relative movement between the tools and the shotgun shells on the support in a direction to advance shotgun shells into registry with successive tools, two of said tools comprising tubular rams, containers for powder and for shot, feeding means for metering powder and shot into the respective rams for delivery therethrough into shotgun shells with which the rams are in registry, a handle and motion transmitting connections including means for actuating both the carriage and the metering means from said handle, said feeding means having cavities for delivering powder and shot and having a way in which it is reciprocable and in further combination with a support and an arm pivotally connecting the way with the support and upon which the way can be moved between upright and inverted positions, the way being provided with apertures with which the cavities of the feeding means register and with screw caps ported in registry with said apertures, the powder and shot containers having threaded mouths detachably engaged with said caps, the containers being inverted in the upright position of the way for discharge of their contents into the cavities of the feeding means and being right side up in the inverted position of the way for removal from said caps without loss of content.

9. A reloader for shotgun shells having ferrules provided peripherally with rims and centrally with caps, said reloader comprising the combination with a base, of a table overlying the base and provided with an opening of sufficient dimensions to pass the rim of a shotgun shell registering therewith, means coacting with said table for guiding successive shotgun shells into registry with said opening, and a recapping device comprising a shell support disposed in said opening and having its upper surface flush with said table, said support being downwardly yieldable below said table and provided with a central socket, a spring biasing said shell support upwardly within said opening to an operative shell-supporting position, a post along which the support is downwardly yieldable against the bias of said spring, said post having means upon which it is mounted and from which it extends into the socket of said shell support and terminating short of the upper surface of said support to carry a primer cap within the socket, means upon which said post is mounted comprising a portion of said base provided with a socket in which the lower end of the post is disposed and from which the post is freely removable upon lifting it respecting the base, said post, spring and support constituting a unit removable as such from the base and table.

10. A reloader for shotgun shells having ferrules provided peripherally with rims and centrally with caps, said reloader comprising the combination with a base, of a table overlying the base and provided with an opening of sufficient dimensions to pass the rim of a shotgun shell registering therewith, means coacting with said table for guiding successive shotgun shells into registry with said opening, and a recapping device comprising a shell support disposed in said opening and having its upper surface flush with said table, said support being downwardly yieldable below said table and provided with a central socket dimensionally adapted to receive a primer cap, a spring biasing said shell support upwardly within said opening to an operative shell-supporting position, a post along which the support is downwardly yieldable against the bias of said spring, said post having means upon which it is mounted and from which it extends into the socket of said shell support and terminating short of the upper surface of said support to carry a primer cap within the socket, the post being adapted to press the primer cap into the ferrule of a shell which is on the support when the support is forced downwardly along the post against the bias of said spring, said reloader including tubular ram means for pressing a shotgun shell downwardly to depress said support, and means for actuating said ram means downwardly with respect to said table for forcing into the ferrule of a shell on the support a primer cap carried on the post and disposed in the socket of the shell support, the table having an arcuate channel in which said opening is disposed and a flange defining the channel and provided with a gap opening into the channel to receive the rim of a shotgun shell, a shell-advancing turret disk resting upon said flange for retaining in said channel the rims of ferrules of successive shells received therein through said gap, said disk being provided with a series of peripheral notches each of which is dimensioned to receive the ferrule portion of a successive shell without passing the rim thereof, the spring biasing the carrier upwardly being seated downwardly upon said disk for biasing the disk downwardly and retaining the rim portions of successive shells in said channel, additional tool means mounted on the carrier for entering into successive shells registering therewith in the manipulation of the disk, the disk constituting means for retaining successive shells in the channel of said table during withdrawal of said additional tool means.

11. A shotgun shell reloader comprising a base, a table having means supporting it above the base and provided with an annular flange defining a work feed channel of sufficient radial extent to receive the rim of a shell to be reloaded, a turret disk provided with means guiding it for rotation upon an axis centered respecting said channel, said disk having radially opening marginal notches of dimensions to receive a shell ferrule while retaining the shell rim in the channel, the said flange being interrupted to provide an opening through which the rim portion of a shell is receivable to enter the channel beneath the turret disk with the ferrule thereof projecting upwardly through the notch of the turret disk, the table being provided with an opening in said channel sufficiently large to pass the rim of a shell, a yieldable shell support detachably mounted in said opening and downwardly removable therefrom, a post for which the base has positioning means, means for holding the shell support yieldably in the opening and comprising a spring encircling the post and engaged with said shell support, the shell support normally substantially filling the opening in the table and being yieldable to a position in which it is substantially below the level of the table, said shell support having a primer-receiving socket which is above the post when the shell support is in the table opening and into which the post moves when the shell support is depressed along the post from said table opening.

12. A shotgun shell reloader according to claim 11 in further combination with a retractable ram registering with said shell support and of a dimension to enter a shell advanced by said turret into position on said shell support, the ram being tubular and provided with re-

tractable means for depressing it into such shell and for urging the shell downwardly to move said support from the table aperture and to engage the shell with a primer supported on the end of said post for the recapping of said shell and for thereafter retracting said ram from the shell.

13. A shell reloader according to claim 12 in further combination with means for delivering powder through the ram into the shell following completion of the recapping of said shell and during retraction of the ram.

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