My invention relates to shell re-loading machines, and the objects of my invention are:

First, to provide a machine of this class which is particularly suited for the sportsman who desires to manufacture or reload his rifle or pistol shells;

Second, to provide a machine of this class which is fool proof in that the machine becomes locked against operation should the shells not be shifted after a charge of powder has been delivered, thus reducing to a minimum the danger of overloaded shells;

Third, to provide a machine of this class which incorporates a simple but novel means of measuring the charge of powder for the shells wherein the means is vibrated with receiving and discharging its load so as to insure uniform loading of the shell;

Fourth, to provide a machine of this class which simultaneously performs the several functions required in the re-loading process, thus the exploded cap is removed, a new cap is inserted, powder is delivered, the end of the shell is enlarged to receive the bullet and a bullet is positioned with each operation of the machine, the several operations taking place on a series of shells carried by the machine, thus providing in a simple machine an arrangement whereby the shells may be readily and quickly re-loaded;

Fifth, to provide a machine of this class which is automatically halted in its operation as soon as the supply of caps is exhausted;

Sixth, to provide a machine of this class which may be adapted for the re-loading of practically every type of rifle, shotgun or pistol shell in common use;

Seventh, to provide a machine of this class in which all the operations thereof are accomplished by a single movement of a lever and wherein the operating elements are so arranged that they may be carried by a common support; and

Eighth, to provide on the whole a novelty constructed shell re-loading machine which is simple of manufacture, proportional to its functions, durable, efficient in its action, and will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is a front elevational view of my shell re-loading machine with the operating elements shown in raised position, Fig. 2 is another side elevational view taken at right angles to Fig. 1 with parts and portions broken away and in section to facilitate the illustration and showing by dotted lines lower position of the operating elements, Fig. 3 is a sectional view through 3—3 of Fig. 1 looking upwardly towards the operating elements, Fig. 4 is another sectional view through 4—4 of Fig. 1 looking downwardly, Fig. 5 is a large fragmentary sectional view through 5—5 of Fig. 4, Fig. 6 is a transverse sectional view through 6—6 of Fig. 1, and Fig. 7 is a developed view following a peripheral line passing through the centers of the several operating elements.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawings.

Base member 1, table 2, post 3, shell registering plate 4, nut 5, support member 6, end fitting 7, shaft 8, operating handle 9, arms 10, pin 11, links 12, pin 13, spring 14, cap inserting mechanism 15, cap ejecting member 16, shell centering member 17, cap inserting pin 18, lever 19, connecting pin 20, spring 21, slide bar 22, cap reservoir stack 23, weight member 24, lever 25, spring 26, cam tongue 27, powder supplying nozzle 28, powder receptacle 29, slide bar 30, spring 31, cam bracket 32, spring 33, crimping member 34, bullet spacing screw 35, centering pin 36, stop member 37, bracket 38, spring 39, and catch means 40 constitute the principal parts and portions of my novel shell re-loading machine.

The machine is mounted upon a circular base member 1. Centrally disposed upon the base member 1 is a table 2 substantially in the form of a short cylinder closed at its upper side. Supported from the base member and the table, and extended upwardly therefrom in centered relation therewith, is a post 3.

The closed upper side of the table is flat and pierced by apertures to receive the necessary mechanism, to be described hereinafter. The upper margin of the table 2 is provided with a low rim 2a. Journaled about the base of the post 3 so as to ride upon the table and fitting within the rim 2a is a shell registering plate 4. The shell registering plate is provided with a series of slots 4a cut radially therein from its periphery. Six of such slots are provided. Between the several slots 4a are apertures 4b, the purpose of
which will be brought out hereinafter. The shell registering plate 4 is held in place by a nut 5. Above the shell registering plate, the post 3 slidably receives a support member 6 which is keyed in a non-rotatable relation therewith. The support member 6 comprises a sleeve 17 and a flange 6a at its lower portion.

The upper end of the post 3 is provided with an end fitting 7 which is provided with a bore traversing the end of the post 3, and adapted to receive a shaft 8. One end of the shaft 8 is provided with an operating handle or lever 8. Adjacent the lateral ends of the end fitting 7 is mounted a pair of arms 10 which extend forwardly, that is in the direction of the user, and pivotally connect by means of a pin 11 to a pair of links 12. The links 12 extend downwardly to opposite sides of a bearing 6c formed on the side of the sleeve portion 6a with its axis extending horizontally. The bearing 6c receives a pin 13 which is joined to the links 12 as shown best in Figs. 1 and 2. The end fitting 7 is provided with an upwardly extending arm 16 to which is attached a spring 14. The spring 16 extends downwardly along the rear side of the sleeve 6a and is suitably attached to the flange 6b. The spring 14 holds the support 6 in its upper position, shown in Figs. 1 and 2. The support carries a set or series of tools or other devices used in reloading rifle shells. At some point, preferably at the left hand portion of the front side of the machine, the rim 2a is notched, as indicated by 2b. The several slots 4a are of sufficient size to receive snugly the shank 21 of a shell F. The undersides of the slots 4a are enlarged so as to form with the top of the table 2, shell rim receiving faces 4c. Thus when the shell registering plate is rotated, the shells are held in an upright position within the slots 4a.

When any one of the slots 4a register with the notch-portion 2b, the adjacent hole or aperture 4b (to the right as viewed in Figs. 1 and 7) is in a registry with an operating bar 15 for the cap inserting mechanism. The operating bar 15 is carried by the flange 6b and is adapted to operate through the aperture upon the cap inserting mechanism, to be described hereinafter.

Continuing to the right or in a clockwise direction, the next slot 4a registers with a cap ejecting member 16 which is bowing away from the flange 6a, as shown best in Fig. 7. The member 16 comprises a relatively deep annular channel 16a formed in its lower end which is adapted to receive the shank 21 of the shells. The inner portion or core formed by the annular channel 16a terminates in a pin 16b which is adapted to pass through a small aperture 83 formed in the base of the shell and which separates the cap receiving recess 84 from the main shell chamber 85. The action of the pin 16b forces the used cap 4b downwardly through a small aperture 2c formed in the top of the table member 2.

At the time when the fore-mentioned slots and apertures are in alignment with the notch 2b, the operating bar 15, and the cap ejecting member 16, the slot next to the right is in registry with a shell centering member performs two functions; one, to align the shell with the cap inserting mechanism, and the other, to spread the extremity of the shell so that a bullet may be readily inserted therein. For the latter purpose the upper portion of the member 17 adjacent its connection with the flange 6b is provided with a diverging or frusto-conical portion 17a. This portion engages and spreads the extremity of the shell when the support 6 is lowered to its extreme position, which is slightly downward of the position shown in Fig. 7.

Below and in axial alignment with the shell centering member 17 is a cap engaging pin 18. The pin 18 is journaled in a sleeve 2d formed in the under side of the table 2. The pin 18 comprises a smaller diametrical portion 18a and a larger diametrical portion 18b, and the sleeve 2d is shaped so that the diametrical portion is approximately equal in diameter to that of the cap C. The cap inserting pin 18 cooperates with a cap inserting mechanism, which will be described hereinafter. The lower end of the pin 18 is engaged by one end of a lever 19 which is pivoted intermediate its ends on a horizontally disposed pin 2e extending inwardly from the side wall of the table 2. The other arm of the lever 19 rests against the under side of connecting pin 20, which is mounted similar to the pin 18 in a sleeve 2f, formed in the under side of the table 2. The operation of the pin 18 is controlled by the operating bar 15, and the upper end of the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position. A spring 21 is provided which causes lever 19 to bear upwardly against the pin 20, and assumes its position when the pin 20 is exposed through the aperture 4b so as to be engaged by said pin when the support is moved to its lower extreme position.
The powder supply nozzle 25 is also supported from the flange 6b, and is in alinement with an aperture 6d therein. The aperture 6d intersects a lateral sleeve 6c formed within a boss or enlargement protruding upwardly from one portion of the flange 6b. In the laterally offset-relation with the aperture 6d, said slot 6e is intersected by an upwardly directed opening 6f adapted to receive the lower end of the powder receptacle 23 which extends upwardly from the sleeve 6c. The flange 6b, and is in allinement with an aperture 6d of the sleeve portion 6a and the fitting 1, as shown best in Figs. 1 and 2. The slot 6e receives a slide bar 30. The slide bar 30 is provided with an aperture 3o therein, the thickness of the slide bar and size of the aperture 3o is such as to more or less the powder quantity of powder to a charge. The slide bar is shiftable back and forth so as to register with either the aperture 6d or the opening 6f. The slide bar 30 is held with the aperture 3o in registry with the opening 6f by means of a spring 31. When the support 6 is moved down, the slide bar is shifted against the action of the spring 31 by means of a vertically disposed cam bracket 32. For this purpose the outer extremity of the slide bar 30 is provided with a roller 30b adapted to engage with a cam 32a. Said cam bracket 32 is supported from the base and extends upwardly therefrom. Its upper extremity is provided with a cam face paralleling the axes of the post 3 and provided with a plurality of notches or serrations 32a. Below this portion, the cam bracket slopes inwardly as indicated by the slots 32b so as to cause the desired movement of the slide bar 30. At the lower extremity of this portion, the cam bracket is provided with a second series of notches 32b engageable by the slide bar when the support is in the lower position, shown by dotted lines in Fig. 2. These notches cause vibration of the slide bar and adjacent portions, and thereby ensure complete filling and discharge of the aperture 3o, and uniformity in the quantity of the charge delivered to the shell.

Opposite the slot in alinement with the powder supply nozzle 25 is a notch 2b similar to the notch 2b. This notch enables the shell to be removed for inspection or other purposes. To prevent accidental removal of the shell at this point, there is provided a leaf spring 33, supported from the cam bracket 32 and engaging the registering periphery of the shell registering plate 4, as shown best in Figs. 3 and 4. The next slot 4a registers with a crimping member 34. Before the shell is moved into alinement with the crimping member 34, and after the powder has been supplied, a bullet 5 is inserted a part way into the upper or open end of the shell, this being easily accomplished by reason of the fact that this end of the shell has been widened or spread by the portion 17a of the crimping member. The crimping member 34 is provided with a relatively deep socket 34a extending upwardly from its lower end, the side walls of which are provided intermediate therein with an inwardly curved constriction 34b adapted to engage the extremity of the shell when the support is in its lower position. The supplying nozzle 25 is a notch 2b similar to the notch 2b sufficiently to receive the bullet. Extending downwardly through the crimping member 34 in screw threaded relation therewith is a bullet spacing screw 35, the lower end of which is adapted to engage the extremity of the bullet and forces it into the shell a fixed distance. The next and last slot 4a aligns with an aperture 2j provided in the top of the table 2 which slot also aligns with a corresponding opening in the base member 1. When the re-loaded shell shifts opposite this position, it slides or stops merely away from the machine and may be caught in a suitable receptacle. The next adjacent aperture 4b, which is the aperture between the last mentioned slot and the first mentioned slot opposite the notch 2b, is adapted to register with a centering pin 36, which is likewise supported from the flange 6b. The centering pin 36 is relatively long and adapted to co-act with an aperture 2k formed in the table 2 which accurately aligns the several operating members with the several shells.

In order to prevent more than one operation of the machine, unless the several operating members have shells in registry therewith, and particularly to prevent the introduction of more than one charge of powder into the shell, there is provided a stop means which limits the action of the support whenever a slot 4a passes into registry with the discharged aperture 2j without carrying a shell. This is accomplished by means of a stop member 37 which is in the form of a plate hinged about a vertical axis on a bracket 38, as shown best in Fig. 4. The plate 37 is bifurcated at its extremity forming one arm 37b which fits over the discharge opening 2j on top of the shell registering plate 4, and a second arm 37b which fits over the centering opening 2k, thereby preventing entrance of the centering pin 36 therein. However, when a shell engages arm 37c by reason of rotation of shell registering plate 4, the stop member is forced against the action of an over center spring 39 until the stop member shifts to the dotted line position, shown in Fig. 4, in which position a bivalved margin 37c of said arm 37c is in alinement with the pin 36, particularly a bivalved slide 36a of its extremity. Thereupon downward movement of the support causes the pin 36 to shift the stop plate back past the center, but allowing the centering pin to pass downwardly then the arms 37a and 37b as soon as the pin 36 is again raised. The stop member snaps back into its position, shown by solid lines in Fig. 4 so that further action is stopped until the shell registering plate 4 is again rotated clockwise, and the next completed shell engages the stop member 37.

The shell registering plate is rotated manually and in order to facilitate alinement with the various members, there is provided a suitable catch means 40 mounted under the table 2 and engageable with the several slots and apertures of the shell registering plate.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

I claim: 1. In a shell re-loading machine, a table, a shell registering plate revolvably mounted thereon and adapted to carry a plurality of shells held above said support and arranged in a circle so as to register with a plurality of apertures in said shell registering plate and act in concert thereupon when said support is reciprocated, and stop means including
a portion carried by said support, and a portion engageable by a shell when said plate is revolved beyond the position assumed for completion of the re-loading operation, said stop means arranged to require rotation of said registering plate to advance the relation of the shells with respect to said element after each reciprocation of said support.

2. In a shell re-loading machine, a revolvable table adapted to support a plurality of shells, a supporting means mounted in reciprocal relation therewith, tools for preparing and re-loading shells mounted on said supporting means, mechanism for shifting said supporting means and causing simultaneous action of the several tools on the plurality of shells supported by said table, and a stop means for limiting said supporting means against further movement after a reciprocation, said stop means including a portion engageable by a shell when said table is revolved beyond said bullet positioning and securing element and shifted thereby to permit further reciprocation of said supporting means.

3. In a shell re-loading machine, a revolvable table adapted to support a plurality of shells, a supporting means mounted in reciprocal relation therewith, a cap ejecting element, a centering element, a powder dispensing element, a bullet positioning and securing element all carried by said supporting means, and arranged to act upon a corresponding series of shells carried by said table, including a portion in registry with said centering element, an operating element carried by said supporting means adapted to actuate said inserting mechanism, means for reciprocating said supporting means and causing concerted action of the several elements carried thereby, and a stop means for limiting said supporting means against further movement after a reciprocation, said stop means including a portion engageable by a shell when said table is revolved beyond said bullet positioning and securing element and shifted thereby to permit further reciprocation of said supporting means.

4. The combination with a shell re-loading machine having a table and a tool support carrying the several shell preparing and re-loading tools arranged to act simultaneously upon a plurality of shells carried by said table, of a powder dispenser carried by said tool support including, a receptacle, a duct adapted to discharge into a shell carried by said table, and an apertured slide bar adapted to register with the bottom of said receptacle of said duct, a bracket cam supported from said table for shifting said slide bar upon reciprocation of said tool support, and means associated with said cam for causing vibration of said slide bar when in registry with said receptacle and said duct for facilitating flow of powder into and out of the aperture of said slide bar.

5. In a shell re-loading machine, a table adapted to support a plurality of shells, a supporting means mounted in reciprocal relation therewith, tools for preparing and re-loading shells mounted on said supporting means, and mechanism for shifting said supporting means and causing simultaneous action of the several tools on the plurality of shells supported by said table, said tools including, a powder dispenser comprising, a duct adapted to discharge into a shell carried by said table, and an apertured slide bar adapted to register with the bottom of said receptacle or said duct, a bracket cam supported from said table for shifting said slide bar upon reciprocation of said supporting means, and means associated with said cam for causing vibration of said slide bar when in registry with said receptacle and said duct for facilitating flow of powder into and out of the aperture of said slide bar.

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