(No Model.) 3 Sheets—Sheet 1.

G. D. HUNTER.

CARTRIDGE LOADING MACHINE.

No. 381,498. Patented Apr. 17, 1888.

Fig. 1.

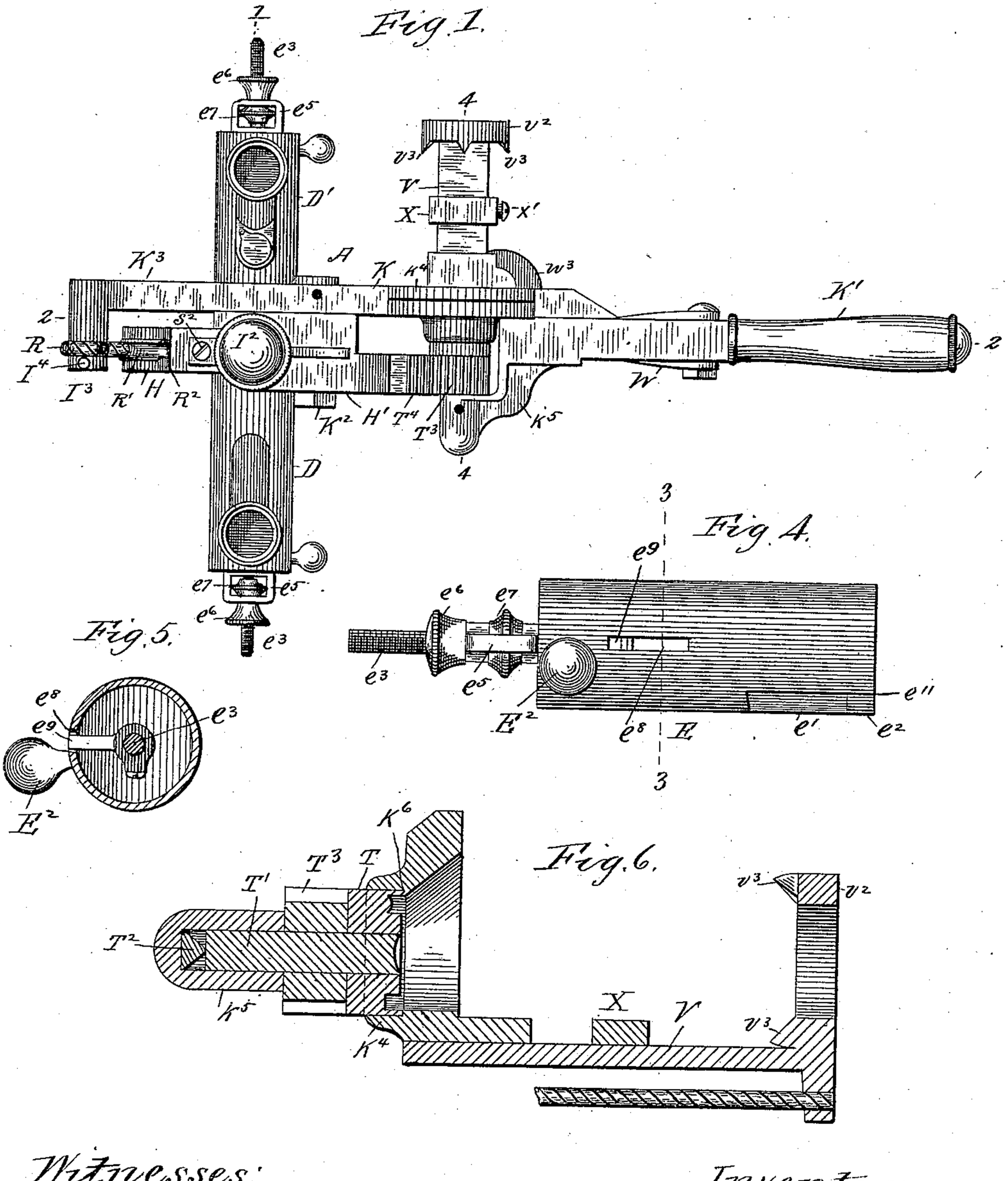

Fig. 5.

Fig. 4.

Fig. 6.

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3 Sheets—Sheet 2.

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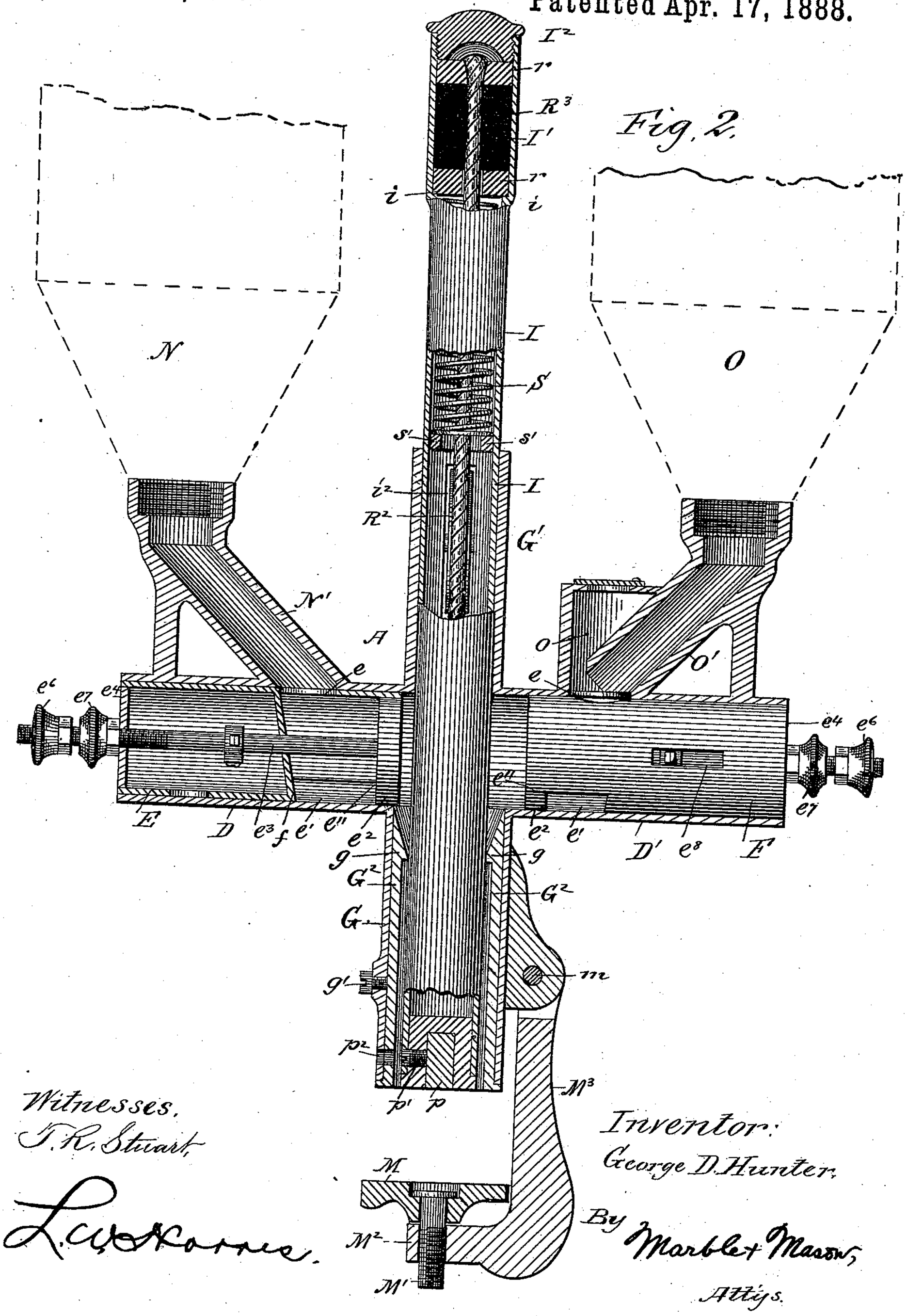
Fig. 2.



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3 Sheets—Sheet 3.

G. D. HUNTER.

CARTRIDGE LOADING MACHINE.

No. 381,498. Patented Apr. 17, 1888.

Fig. 3.

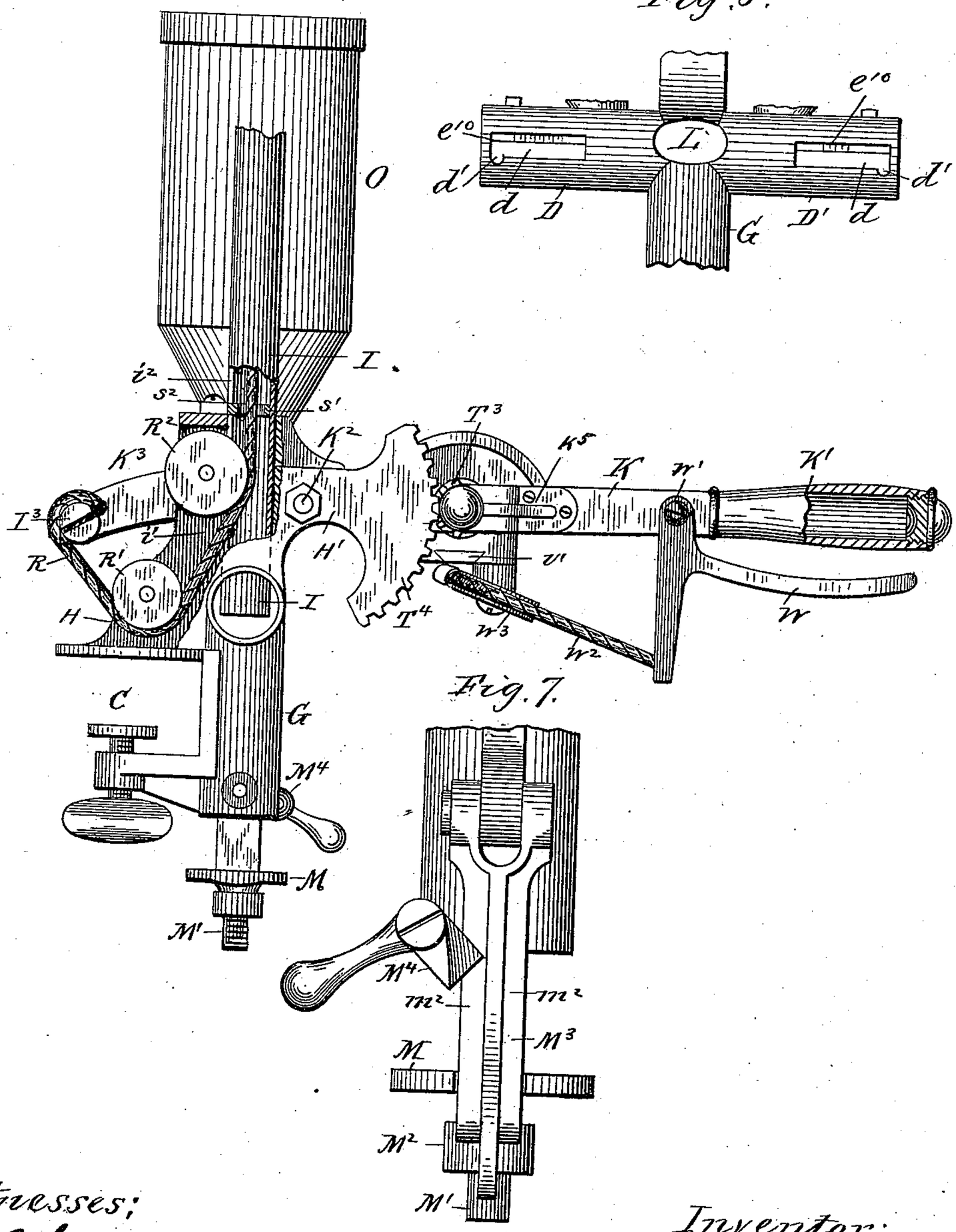

Fig. 8.

Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE D. HUNTER, OF AUBURN, ILLINOIS, ASSIGNOR OF ONE-HALF TO ELIZABETH HUNTER, OF SAME PLACE.

CARTRIDGE-LOADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,498, dated April 17, 1888.

Application filed June 24, 1887. Serial No. 242,396. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. HUNTER, a citizen of the United States, residing at Auburn, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cartridge-Loading Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to portable machines for loading cartridge-shells with powder and shot.

The main object of my invention is to construct a portable machine of simple and compact form embodying improved co-operating devices which will continuously and consecutively perform with accuracy and rapidity the various operations of filling the shell with graduated charges of powder and shot, each charge being wadded and securely rammed within the shell before removing it from the machine, after which the shell will be placed in a second position upon the machine to be crimped by the action of the rammer, the intermediate connections, and the operating-lever while the next succeeding shell is being filled.

The improvement consists in the novel construction and arrangement or combination of parts for delivering powder and shot with accuracy and rapidity to an intermediate shell-holding cylinder provided with an opening for the introduction of wads; in novel means for graduating and registering the charges of powder and shot; in novel means for relieving the shot-pressure within the measuring-cylinder; in novel means for operating the rammer, and also for crimping one shell simultaneously with the action of ramming another shell; in novel means for holding the cartridge while being filled, for adapting the machine to receive shells of various diameters and lengths, and for holding dies for marking the size or number of the shot upon the end wad of the cartridge, and in certain other novel features of construction and combination of parts, as hereinafter disclosed in the description and claims.

In the accompanying drawings, forming part of this specification, and in which the same reference-letters indicate the same parts, Figure 1 represents a plan view of my improved machine with the measuring-cylinders removed; Fig. 2, a sectional elevation on line 1 1 of Fig. 1; Fig. 3, a side elevation with a portion of the casing broken away on line 2 2 of Fig. 1; Fig. 4, an enlarged detail in elevation of one of the adjustable measuring-cylinders; Fig. 5, a section on line 3 3 of Fig. 4; Fig. 6, an enlarged section on line 4 4 of Fig. 1, showing the crimping device attached to the ramming-lever; Fig. 7, a side elevation of the lower end of the shell-holding cylinder, the adjustable rest-plate for supporting the cartridge-shell beneath said cylinder, the swinging elbow-arm and the latch for holding the same, and the rest-plate beneath the lower end of the said cylinder; and Fig. 8, a broken front elevation of the lower portion of the casing, showing the opening in front for the insertion of the wads into the shell-holding cylinder, and also showing the graduations on the guide-chambers.

The various operating or movable parts of the machine are combined with a casing, A, of novel construction, to which said parts may be readily and accurately fitted, and which is adapted or constructed to be securely clamped upon a table or other suitable support by means of a clamp, C. The frame-work or casing has its several parts formed integrally, and consists of cylindrical guide-chambers D and D′, located horizontally and in the same axial line, which receive separately-movable measuring cylinders E and F—one for powder and the other for shot—of a vertical shell-holding cylinder, G, located intermediately of and to axially intersect with the cylindrical guide-chambers D and D′, of the jaws of the clamp C, of the rear bracket or extension, H, and the front bracket or extension, H′, and of the upright rammer-guide cylinder G′, which is located directly above and in axial line with the shell-holding cylinder G, and serves to support the rammer I and permit the same to be reciprocated in both the rammer-guide cylinder and the shell-holding cylinder. The front bracket or extension, H′, serves as a support or fulcrum for the operating-lever K.

An opening, L, is formed in the front of the

casing at the junction of the four cylinders, as shown in Fig. 8, through which wads are passed into the upper end of the shell-holding cylinder after each successive charge has been emptied into the cartridge-shell.

A rest-plate, M, for supporting the shell-holding cylinder, is adjusted vertically by a screw, M′, passing through the elbow M^2 of a swinging arm, M^3, pivoted at *m* to the lower end of the casing and adapted to fall by its gravity beneath the lower open end of the shell-holding cylinder and be held in such position by a latch, M^4, also pivoted to the casing. Said latch is of the form shown in Fig. 7 of the drawings, and is arranged to rest by gravity in rear of and against a ledge or flange, m^2, on the vertical member of the swinging arm M^3, and thus operate to hold the rest-plate M beneath the lower end of the shell-holding cylinder during the operation of loading the cartridge. On raising the handle of said latch slightly upward, so as to release said latch from the flange m^2, the swinging arm and the rest-plate carried thereby may be moved or swung from beneath the shell-holding cylinder, so as to permit an empty shell to be placed therein or a completed carriage to be removed therefrom. Under this construction and arrangement of parts the shell-holding cylinder is adapted to receive shells of different lengths and to permit of their easy introduction and removal. The rest-plate M is disk-shaped, and is notched or cut away upon one side, as shown in Fig. 7, to receive and slide upon the flanges m^2 on the arm M^3, and thereby be prevented from turning when moved up and down by the screw M′; also, said rest plate or disk M is loosely mounted upon the screw M′, and is made thicker and heavier on one side than the other, as shown in Fig. 2, so that it will yield or tilt slightly during the removal of the filled cartridge therefrom.

The shell-holding cylinder G is constructed to contain a bushing, G^2, for receiving the shell, said bushing having a shoulder, *g*, upon its inner surface, near the upper end, against which the shell may be held by the rest-plate M. Shells of different diameters may be fitted into the cylinder G by placing bushings G^2 of different sizes therein and securing them thereto by a clamping-screw, *g*′, passing through the outer cylinder.

The powder-canister N and shot-canister O are closed at their tops and mounted upon the guide-chambers D and D′, and communicate with the interiors thereof by chutes N′ and O′, which project and incline upwardly from said guide-chambers. The measuring-cylinders E F, which are fitted within the guide-chambers, have holes *e* formed in their upper sides for receiving the charges of ammunition from the chutes and holes *e*′ in their under sides for emptying said charges into the upper ends of shells when placed within the holding-cylinder G. These measuring-cylinders are movable, by the devices hereinafter described, for the purpose of emptying their chambers directly over the upper ends of the shells, so as to insure the complete delivery thereto of their contents. A pocket, *o*, on the upper side of the chute O′ affords room for receiving any shot which may be held between the inlet-hole *e* in the measuring-cylinder F and the discharge-opening of the chute, owing to the pressure of the shot within the shot-canister and chute, and thus prevent the shot from clogging or from being cut in two by the movement of the end of the cylinder past the chute-opening.

The capacity of the measuring-cylinders E and F may be varied by means of movable heads e^2, made fast upon the ends of screw-rods e^3, which pass freely through the fixed heads e^4 and the inclined annular walls *f* of said cylinders and through brackets e^5, formed or secured upon the outer sides of said fixed heads. Upon these screw-rods are fitted adjusting-nuts e^6 e^7, one arranged within and the other on the outside of said brackets and adapted for moving and holding the heads e^2 of said cylinders in any required adjustment. The cylinders E and F also have slots e^8, through which pins e^9, mounted on the screw-rods e^3, pass, so as to be visible upon the outsides of the cylinders. Each pin e^9 has an index-mark upon its face, which registers with graduations e^{10}, formed upon the edge of a slot, *d*, in the side of the guide-chamber; or, if preferred, said graduations may be placed upon the outsides of the measuring-cylinders E and F. In the back-and-forth movements of the movable heads e^2 they are prevented from turning by peripheral projections e^{11}, which enter and slide along the walls of the holes *e*′ in the lower sides of the measuring-cylinders.

The measuring-cylinders E and F are reciprocated within the guide-chambers D and D′ by weighted pins E^2, which pass through the slots *d*, formed in said guide-chambers; also, the slots *d* have notches *d*′ in their outer ends, into which the weighted pins E^2 are placed when the measuring-cylinders are drawn fully back within their guide-chambers for receiving their charges and hold said measuring-cylinders securely in such positions until it is desired to empty their charges into the shell. The pins E^2 are screwed into the cylinders E and F, so that when they are removed therefrom the cylinders may be withdrawn through the open ends of the guide-chambers D and D′. These open ends of the guide-chambers also admit of the adjustment of the movable heads e^2 of the measuring-cylinder by the simple means described.

I represents the rammer, the lower end of which is bushed or otherwise suitably constructed to receive the shank of a marking-die, *p*, which is secured therein by a set-screw, *p*′, passing into the rammer and binding against said die. A hole, p^2, in the lower end of the shell-holding cylinder G affords a passage through which the screw *p*′ and a screw-driver are inserted for clamping or releasing said die.

By this means dies with different numbers may be secured to the rammer and are used to mark the size or number of the shot with which the cartridge is charged.

The operating-lever K is provided with a handle, K′, which is made hollow and closed at its end by a screw-cap, so as to provide a safe and convenient receptacle for the removable dies *p*, screw-driver, and other loose pieces or tools which may be used with the machine.

The operating-lever K is pivoted by a bolt, K^2, to the extension H′ of the forward side of the casing A and passes along the side of the rammer I to the rear side of said casing. The rearward extension, K^3, of the lever is connected by a split pin, I^3, and a set-screw, I^4, with the end of a cord, R, formed of cable-wire, catgut, or other suitable material, which passes beneath the grooved rollers or pulleys R′ and R^2, journaled upon the extension H, projecting rearwardly from the casing A, through an opening in said casing and up into the enlarged part I′ of the rammer, where it is secured. A rubber block, R^3, confined between disks *r*, secured to the end of the cord R and fitted in a recess so as to rest upon a shoulder, *i*, at the upper end of the rammer, relieves the cord of any sudden strain brought upon it by a sudden blow with the rammer. The enlarged or top end of the rammer is fitted with a screw-cap, I^2, which will permit the cord and rubber block to be removed or repaired if broken.

The rear side of the extension H of the casing is longitudinally slotted at *i′* for receiving the cord R and the rim of the grooved roller R^2; also, the rear side of the rammer is formed with a longitudinal slot, i^2, in alignment with but of greater length than the slot in the casing, so as to permit of the vertical reciprocation of said rammer. Under this construction and arrangement of the parts the rammer may be reciprocated and the strain upon the rope brought directly upon the axial line of the rammer with its full effective force; also, the interposition of the cord and pulleys between the plunger and the operating-lever renders the machine more compact and conveniently portable than and not so cumbersome and liable to get out of order as those machines in which the rammers or plungers are operated by long levers attached to their upper ends and to high standards projecting upwardly from the frame-work.

A spiral spring, S, inclosed within the rammer, surrounds the cord R and rests upon the ring *s′*, having a neck extending out through the slot *i′* of said rammer and bolted at s^2 to the top of the casing-extension H. This spring serves to restore the rammer and its operating-lever to their normal positions.

The lever K carries at a point between its pivot K^2 and the handle K′ a crimper, T, fitted upon a shaft, T′, revolving in bearings K^4 on said lever. This lever also supports a cartridge-carrier, V, fitted in a guideway, *v′*, as shown in Fig. 3, and adapted to slide crosswise of the lever, so as to feed the end of the loaded cartridge to the revolving crimper. The movable head v^2 of the carrier has spurs v^3, which prevent the cartridge from revolving while being crimped. The working-edges of the crimper are of any well-known or preferred construction. The cartridge-carrier V is moved in its guideway for carrying the cartridge toward the crimper by means of a grip-lever, W, pivoted at *w′* to the lever K and connected by a cord, w^2, passing around a sheave or pulley, w^3, journaled to and beneath said lever with the end of said carrier. By this means the cartridge may be forced to bear with a steady continuous pressure against the rotary crimper while being operated upon. The carrier may be easily pushed back by hand when the cartridge is to be removed. The bearings of the crimper T and shaft T′ are supported upon a bracket, k^5, bolted to the lever to hold the face of said crimper opposite the smaller end of a circular tapering hole or guideway, k^6, bored through the said lever. A cartridge held upon the carrier may thus be accurately and readily centered at its open end within the crimper; and by moving the carrier outward the loaded cartridge may be easily removed from the crimper when finished. The outer end of the shaft T′ is formed flat, and a conical-shaped pin, T^2, of hardened steel, is stepped in the recess in the outer end of the bracket k^5, receives the end-thrust of the said shaft, and permits it to run lightly.

A sliding gage-block, X, mounted upon the cartridge-carrier V, and secured adjustably thereto by a set-screw, *x′*, abuts against the opposing face of the lever K and serves to arrest the carrier when the cartridge has been sufficiently crimped. This gage-block may be set to suit cartridge-shells of different lengths.

The crimper is rotated by a pinion, T^3, upon the shaft T′, which engages with a toothed segment plate or rack, T^4, secured to or formed integrally with the front extension, H′, of the casing A. By this means the crimper is rotated; also, by the vibratory movement of the lever and the action of the parts connected therewith one cartridge is crimped while the succeeding cartridge is being rammed.

The operation of my machine is simple, and consists, first, in adjusting the measuring-cylinders for the required amount of powder and shot, then in fitting the cartridge-holder with a bushing corresponding to the diameter of the shell to be used, and next securing a die upon the rammer of proper character to indicate the size or number of shot to be used. The rest-plate is then adjusted beneath the cartridge-holder to suit the length of the shell, and the shell is placed within the holder. The rammer and lever are held raised in their normal positions by the spiral spring, and the measuring-cylinders are all open. The powder-measuring cylinder is first moved the full length of its chamber or across the top of the cartridge-holding cylinder. The contents of

said cylinder is then discharged into the shell and the cylinder returned to its first position. A wad is next placed through the opening in the casing and the rammer pulled down by the lever to force said wad soldily home within the shell. The spring then raises the rammer to clear the measuring-cylinder chambers. The shot-measuring cylinder is then moved within its casing to empty its charge into the shell. A second wad is then passed through the wad-opening and the rammer is forced down and presses it tightly into the shell, leaving the impress of the die upon the outer face of the wad to indicate the size or number of shot employed. The spring then restores the rammer and the operating-lever to their raised positions. Then the cartridge may be removed from the shell-holder by the downward movement of the lever and rammer, and then placed in its second position upon the machine, to be held by the cartridge-carrier to the crimper. The crimper grip-lever is then grasped, and the cartridge first filled by the machine is then crimped while the next succeeding cartridge-shell is being filled by the reciprocating movement of the lever and rammer. The measuring-cylinders must both be replaced to their first positions before the rammer can descend into the shell.

The casing may be easily and accurately cast and bored to receive the measuring-cylinders, rammer, and bushing, as the axial lines of the guide-chambers, the rammer-guide, and shell-holding cylinders cross each other at right angles, so that their interiors may be bored through and through without shifting the casing more than once upon the boring-tool.

Various modifications may be made in some of the devices herein shown and described without departing from my invention—as, for instance, it is obvious that the rammer-lever may be counterbalanced at the end of its rear extension, and that an auxiliary spring may be employed to raise the lever.

By operating the grip-lever and its connections with the cartridge-carrier shells may be uncapped by placing them in said carrier with their cap ends held in the head v^2 of the carrier and by placing a punch between the crimper-wheel and the caps on the heads of the cartridge-shells; also, by the operation of said grip-lever and its connections caps may be secured to empty shells by reversing said shells and passing them through the central opening of the head v^2 and bringing the punch to bear upon the caps and the crimper-wheel to bear upon the punch.

It will be obvious from the foregoing that my machine combines, as a whole, all of the devices necessary for use in the work of loading empty cartridge-shells, crimping filled shells, removing the caps from shells which have been unloaded, and again capping the same before filling, thus saving the user a great deal of inconvenience in handling and danger in losing separate and disconnected devices which are ordinarily employed for performing the work accomplished by my machine; also, this machine is light and portable and can be packed in a satchel or valise and carried along on gunning expeditions; also, it avoids danger or accident from explosion resulting from sparks caused by smoking and the like during the operation of loading the shells, as its several parts are sufficiently closed for this purpose.

Having thus fully described my invention, what I claim as new is—

1. In a cartridge-loading machine, the frame or casing having vertically-arranged rammer-guide and shell-holding cylinders, horizontally-arranged cylindrical guide-chambers located on opposite sides of said rammer-guide and shell-holding cylinders, and front and rear brackets or extensions, the said parts of the frame or casing being integrally formed, substantially as and for the purposes described.

2. In a cartridge-loading machine, the integrally-formed frame or casing consisting of vertically-arranged rammer-guide and shell-holding cylinders and horizontally arranged cylindrical guide-chambers located upon opposite sides of said rammer-guide and shell-holding cylinders, in combination with separate measuring-cylinders adapted to be independently reciprocated in said guide-chambers in their axial lines, so as to empty their contents directly into the said shell-holding cylinder, the rammer, and means for reciprocating the same, substantially as described.

3. In a cartridge-loading machine, the integrally-formed frame or casing consisting of the vertical cylinders, the upper one of which guides the rammer and the lower one holds the shell, and horizontal cylindrical guide-chambers crossing the same intermediately and in axial line, in combination with the reciprocating hammer, the independently-movable cylindrical measuring-cylinders supported in said horizontal cylindrical guide-chambers, and ammunition-canisters mounted thereon, substantially as described.

4. In a cartridge-loading machine, the combination, with the frame or casing having guide-chambers and a shell-holding cylinder communicating with each other, of separate movable measuring-cylinders adapted to be moved independently within said guide-chambers in the same axial line, and so as to cross the shell-holding cylinder, substantially as described.

5. In a cartridge-loading machine, the combination, with the frame or casing having integrally-constructed cylindrical guide-chambers formed with slots having notches, of a shell-holding cylinder communicating therewith and independently-movable measuring-cylinders fitted to reciprocate within said guide-chambers, each having a handle adapted to move within the slot and engage with its notch, substantially as described.

6. An ammunition-measuring cylinder for cartridge-loading machines, comprising a cy-

lindrical case formed with inlet and outlet holes and provided with an inclined annular wall and with a fixed and an adjustable head, substantially as described.

7. An ammunition-measuring cylinder for cartridge-loading machines, comprising a longitudinally-slotted cylindrical case having inlet and outlet holes, an inclined annular wall, a fixed head, and a movable head adapted to fit and slide therein, and an adjusting screw-rod having an index-pin thereon projecting through the slot in said cylinder, said screw being connected with the movable head for adjusting the same, substantially as described.

8. In a cartridge-loading machine, the combination, with the casing having integrally-formed open-ended guide-chambers and a shell-holding cylinder communicating with the latter, of movable ammunition-measuring cylinders, each being fitted with an inclined annular wall and a fixed and an adjustable head and adapted to be removed from and inserted through the ends of said guide-chambers, substantially as described.

9. In a cartridge-loading machine, the combination, with the measuring-cylinder having the inclined annular wall and the fixed head and the yoke, of the sliding head, and the screw shaft or rod passing through the yoke, the fixed head, and inclined annular wall and yoke, and provided with the set-nuts for adjusting the sliding head, substantially as described.

10. In a cartridge-loading machine, the combination, with the slotted guide-chamber provided with graduations near the slot, of the measuring-cylinder arranged within said guide-chamber and provided with a fixed head and a movable head, and a screw-rod having an indexed pin for registering with said graduations on the guide-chamber, substantially as described.

11. In a cartridge-loading machine, the combination, with a casing having two vertically-arranged and two horizontally-arranged chambers or cylinders formed integrally and intersecting intermediately of their axial lines and having at said point of intersection a wad-opening, of separately-movable measuring-cylinders fitted in the horizontal chambers, a rammer fitted to work in the upper chamber, and means for holding the shell in the lower chamber, substantially as described.

12. In a cartridge-loading machine, the combination, with the casing having a shell-holding cylinder, of a swinging arm pivoted to the casing and projecting beneath said shell-holding cylinder, a rest-plate, M, notched to engage with the upright portion of said arm, and a set-screw beneath the same for adjusting it, substantially as described.

13. In a cartridge-loading machine, the combination of the casing having the shell-holding cylinder, the swinging arm pivoted to the casing and projecting beneath said shell-holding cylinder, the adjusting-screw, and the rest-plate loosely mounted thereon, notched to engage with the flanges on said swinging arm and having one portion thicker or heavier than the other, substantially as described.

14. The combination, in a cartridge-loading machine, of the casing having a shell-holding cylinder, the swinging arm pivoted to the casing and carrying a rest-plate adapted to drop beneath said shell-holding cylinder, and a latch pivoted to the casing for holding said arm and rest-plate in position, substantially as described.

15. In a cartridge-loading machine, the combination, with a casing having a shell-holding cylinder, of removable cylindrical bushings for receiving shells of various sizes, provided with shoulders upon their inner surfaces, near their upper ends, and fitted within said shell-holding cylinder, and secured by a set-screw abutting against said bushings, substantially as described.

16. In a cartridge-loading machine, the combination, with the casing having a shell-holding cylinder provided with a hole in its lower end for admitting a screw-driver, of a rammer having a centrally-apertured bushing secured in its lower end, a removable marking-die having its shank fitted in said aperture, and a screw passed through the hole in the lower end of said shell-holding cylinder and into the lower end of said rammer for binding or releasing the shank of said die, substantially as described.

17. In a cartridge-loading machine, the combination, with the casing having a shell-holding cylinder, of a reciprocating rammer adapted to move therein, the cord attached at one end to said rammer, the grooved pulleys attached to the casing and having the cord passed beneath them, and the operating-lever having said cord attached at its rear end and a hollow screw-capped handle at its opposite end, substantially as and for the purpose described.

18. In a cartridge-loading machine, the casing having a horizontally-arranged cylindrical guide-chamber provided with a chute leading to the shot-canister and formed with an enlarged pocket above the discharge-opening of said chute for relieving the shot of pressure, in combination with the horizontal shot-measuring-cylinder fitted and movable within said guide-chamber, substantially as described.

19. In a cartridge-loading machine, the combination, with the casing having the guide and shell holding cylinders formed integrally therewith and the independently-movable measuring-cylinders, of a reciprocating rammer, and a lever pivoted to the casing and connected by a cord and pulleys to said rammer, substantially as described.

20. In a cartridge-loading machine, the combination, with the casing having a shell-holding and a rammer-guide cylinder, of the rammer adapted to move vertically in said rammer-guide cylinder, a spring inclosed in said rammer, an operating-lever, and a cord con-

nected to said lever and passing up into said rammer, to which it is fastened, substantially as described.

21. In a cartridge-loading machine, the combination of a casing having a shell-holding cylinder with a rammer provided with a rubber block in its upper end, a cord attached at one end to said rubber block, and an operating-lever to which the other end of said cord is attached, said rubber block acting to relieve the cord of any strain brought upon it by a sudden blow of the rammer, substantially as described.

22. In a cartridge-loading machine, the combination, with the casing, of a vibratory lever, a revolving crimper supported upon said lever, gearing connected thereto and engaging a rack on the frame, and thereby revolving said crimper by the movement of the lever, and a movable cartridge-carrier mounted upon said lever for feeding the cartridge to the crimper, substantially as described.

23. In a cartridge-loading machine, the combination, with the casing, of a vibratory lever, a revolving crimper thereon, gearing engaging a rack on the frame and revolving said crimper by the movement of said lever, a cartridge-carrier fitted to slide upon said lever, a grip-lever, and a cord connected with the carrier for actuating it, substantially as described.

24. In a cartridge-loading machine, the combination, with the casing, of the lever pivoted thereto, a crimper carried thereby and rotated by gearing operated by the movement of said lever through the engagement of such gearing with a rack on the frame, a carrier fitted in guides upon the lever, a grip-lever, a pulley, and a cord connecting said grip-lever with the carrier, substantially as described.

25. In a cartridge-loading machine, the combination, with the casing A, of the vibratory lever K, the rotary crimper T, the shaft T′, the pinion T^3, the rack T^4, the carrier V, fitted to slide in guides upon said lever, and a gage-block, X, adjustably secured upon said carrier to adapt it for shells of different lengths, substantially as described.

26. In a cartridge-loading machine, the casing A, the rack T^4, and the vibratory lever K, attached to said casing, said vibratory lever having operatively arranged upon it and combined with it the rotary crimper T, having a conical recess leading to the crimper devices, the shaft T′, the pinion T^3, the carrier V, and also the grip-lever W and the cord w^2, the latter being attached to said carrier and grip-lever for moving the cartridge within said conical recess and into proper alignment and contact with said crimper, substantially as described.

27. In a cartridge-loading machine, the combination, with the casing, of a vibratory lever, a crimper, a supporting-shaft therefor having bearings upon said lever, the cartridge-carrier, and a conical pin supported upon the lever to receive the thrust of the crimper, substantially as described.

28. In a cartridge-loading machine, the combination, with the shell holding cylinder G, of the rammer I, the cord R, the pulleys R′ R^2, the vibratory lever K, for operating said rammer, the crimper T, the toothed segment plate or rack T^4, and the pinion T^3, substantially as described.

29. In a cartridge-loading machine, the combination of the casing, the vibratory lever pivoted thereto, the rotary crimper and its gear-pinion and bearings arranged upon said vibratory lever, and a stationary segment gear or rack attached to said casing for engaging and rotating the pinion and crimper, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE D. HUNTER.

Witnesses:
SOLON C. KEMON,
CHAS. A. PETTIT.