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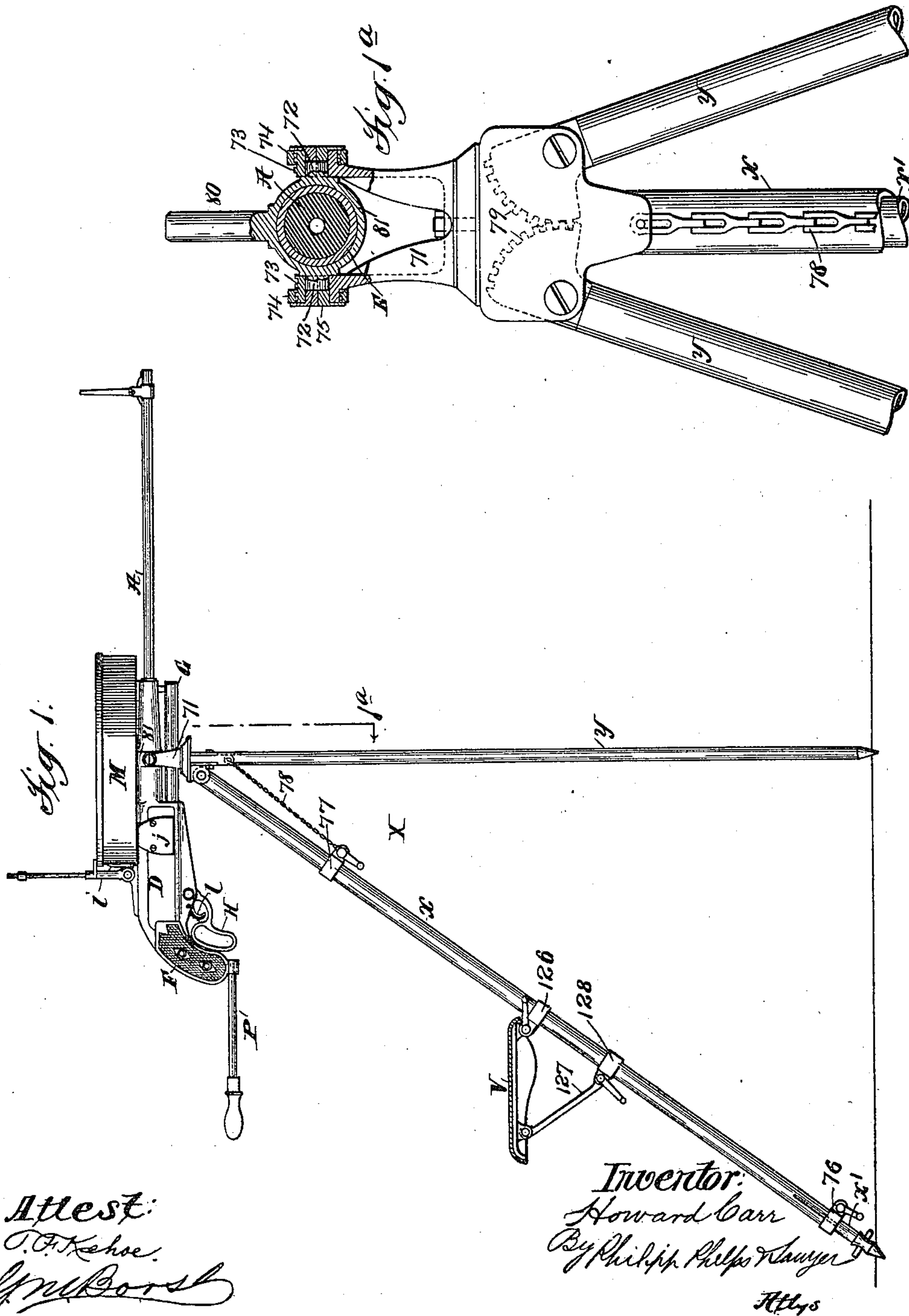
Patented Aug. 27, 1901.

H. CARR.
MAGAZINE GUN.

(Application filed Sept. 14, 1898.)

(No Model.)

6 Sheets—Sheet 1.



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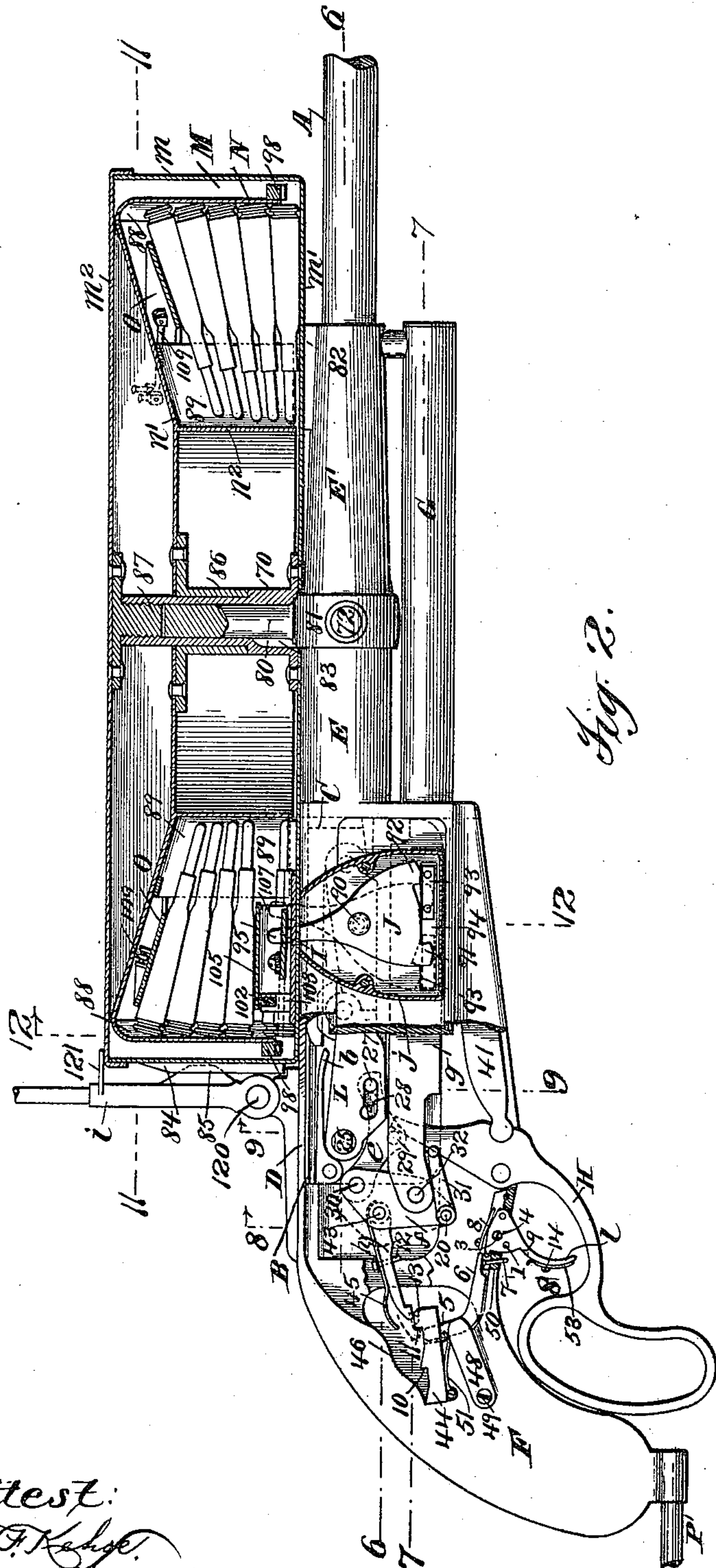


Fig. 2.

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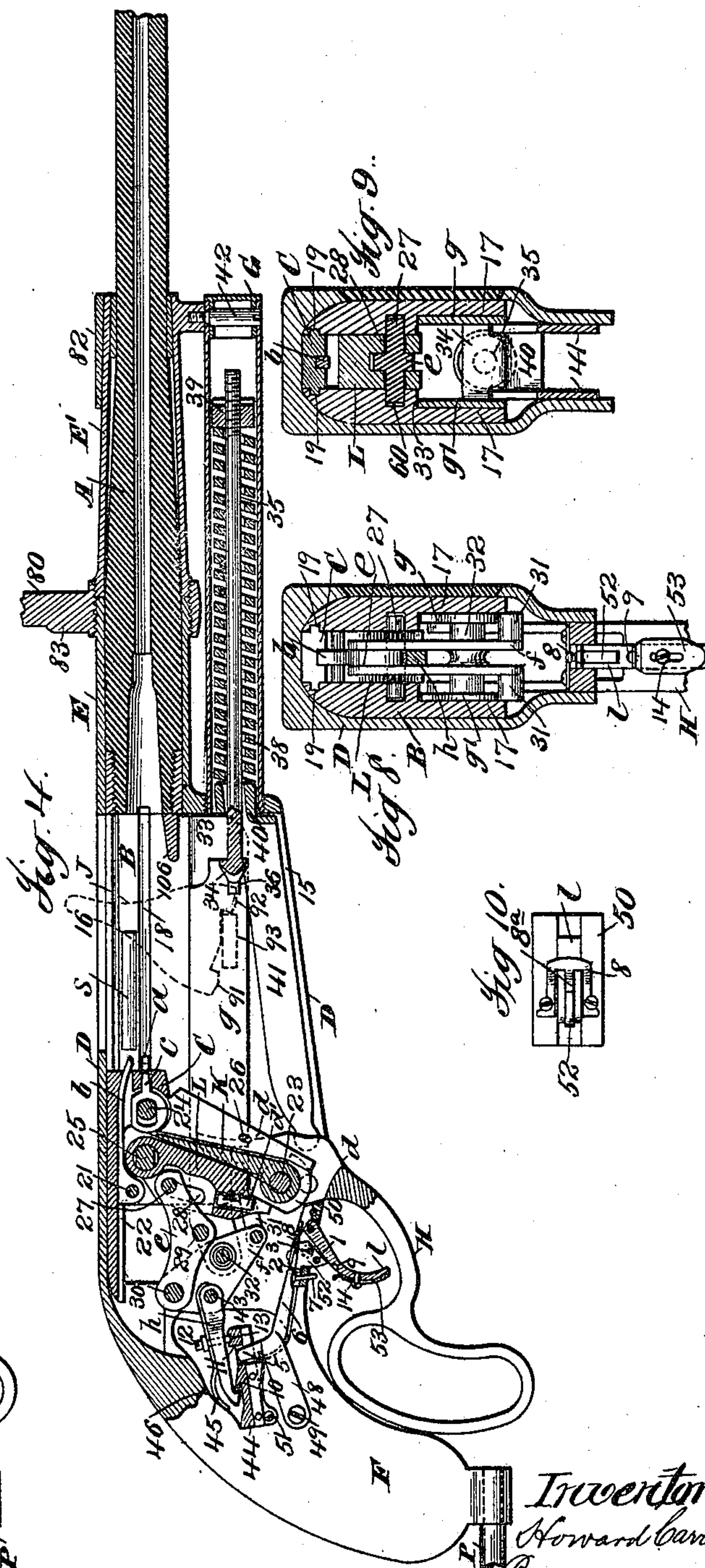
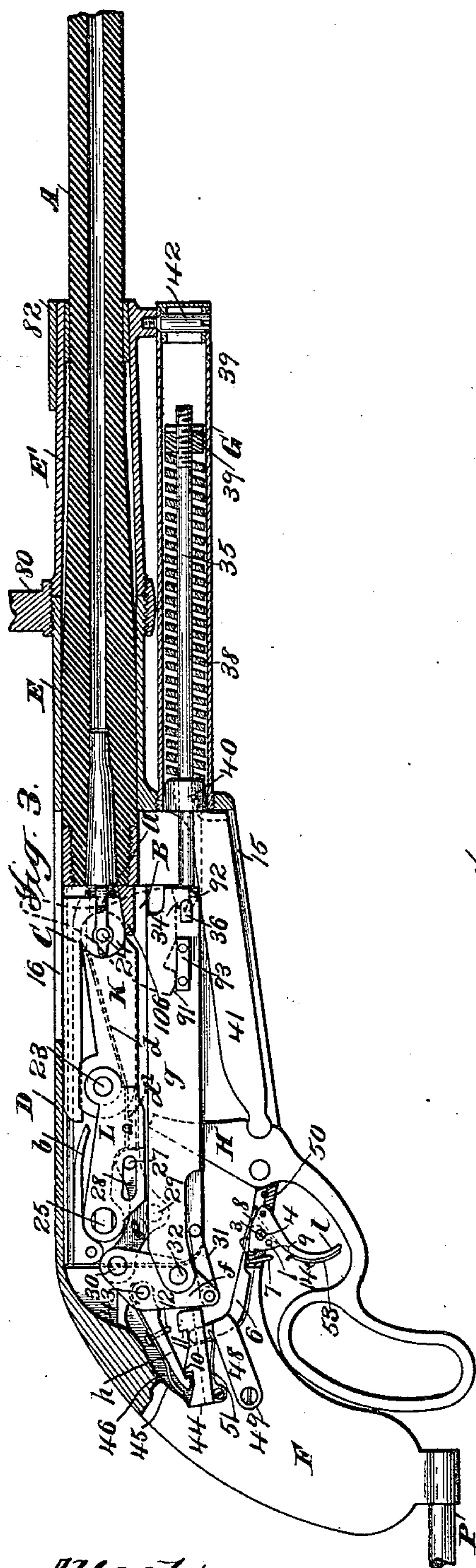
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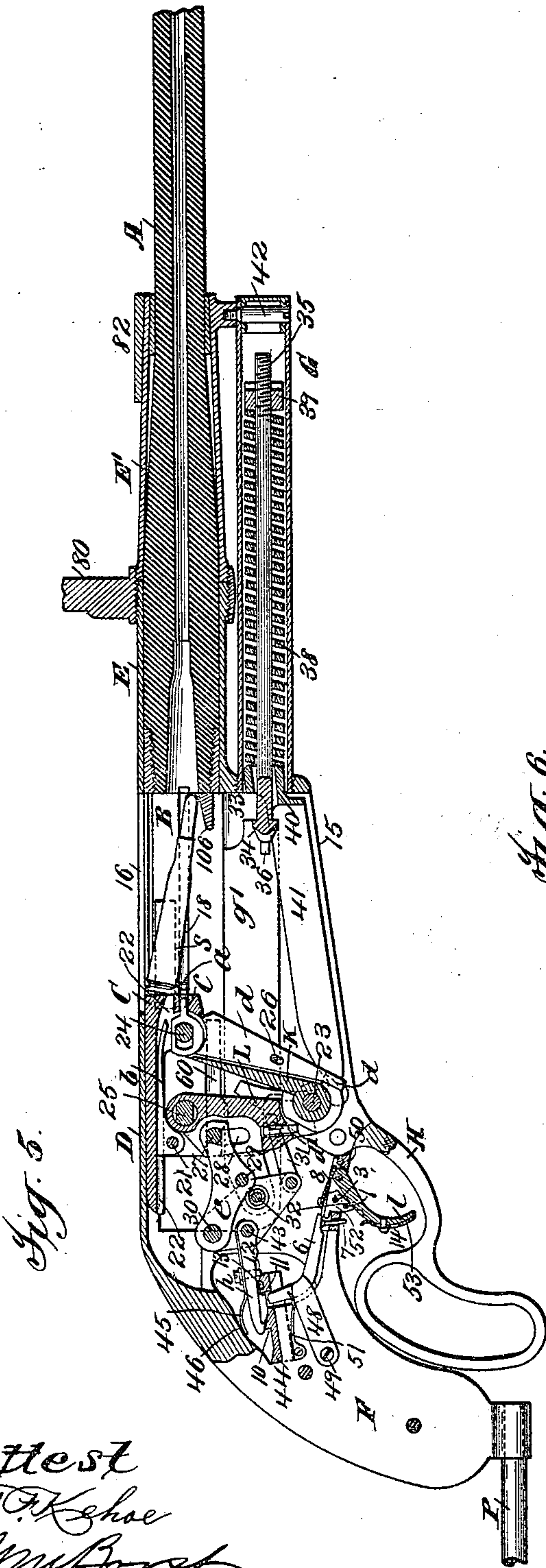
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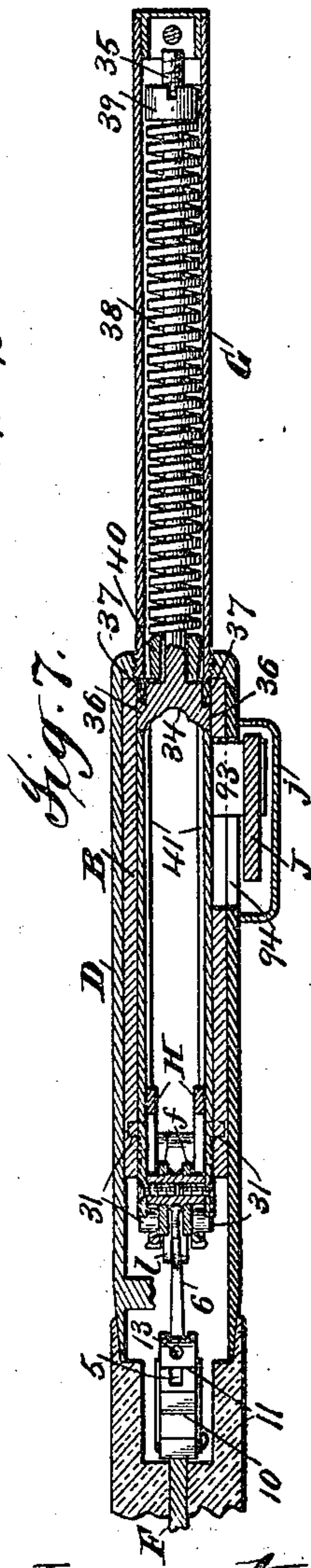
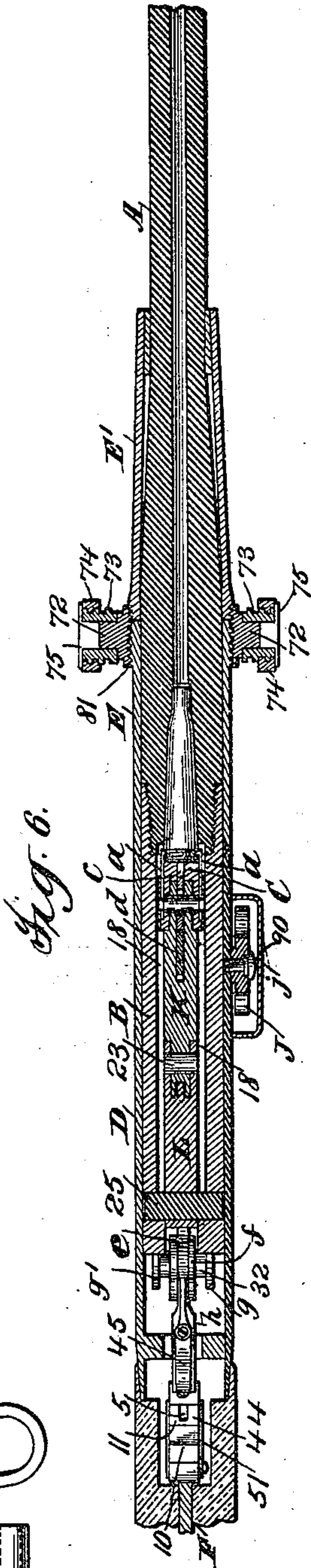
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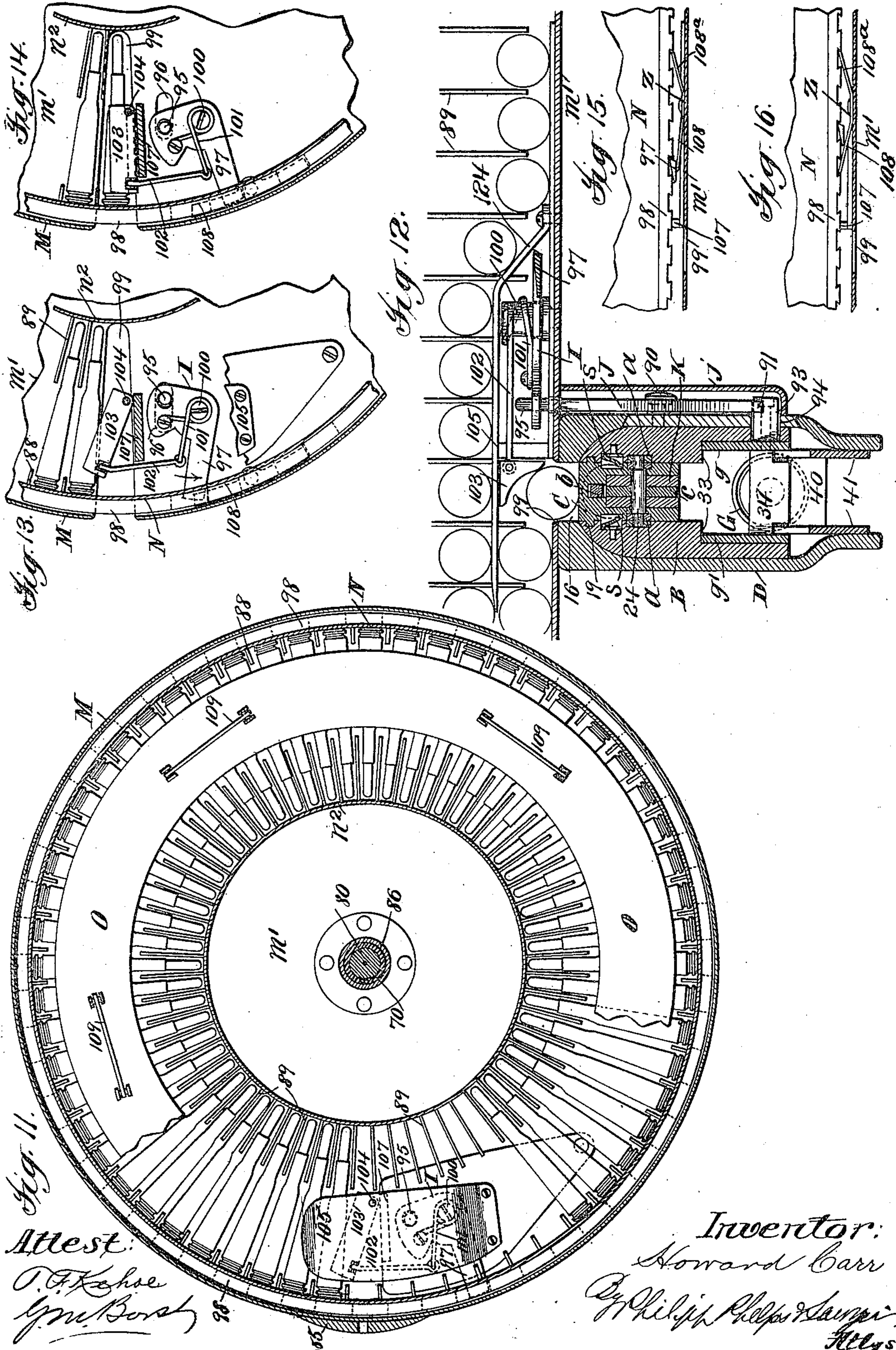
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(Application filed Sept. 14, 1898.)

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6 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

HOWARD CARR, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE SAN FRANCISCO ARMS COMPANY, OF SAME PLACE.

MAGAZINE-GUN.

SPECIFICATION forming part of Letters Patent No. 681,439, dated August 27, 1901.

Application filed September 14, 1898. Serial No. 690,901. (No model.)

To all whom it may concern:

Be it known that I, HOWARD CARR, a citizen of the United States, residing at San Francisco, county of San Francisco, and State of California, have invented certain new and useful Improvements in Magazine-Guns, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates especially to an improved gun of that class known as "recoil-operated" guns, in which the energy developed by the recoil when the gun is fired is utilized in retracting the breech-block from the barrel to open the breech and performing the other operations of the gun required for a new discharge.

The invention is intended especially for use in machine or field guns; but it is applicable also to other classes of firearms.

The especial object of the present invention is to provide an improved machine or field gun employing the breech-movement of my prior Letters Patent No. 584,153, dated June 8, 1897; and the invention includes certain improvements in the construction and arrangement of the parts by which the recoil is utilized in performing the breech operations and certain features of construction and combinations of parts in a gun of this general organization, as well as certain features of construction which are applicable also in other classes of guns employing a different breech movement. I have devised also a novel magazine construction and means for feeding cartridges therefrom to the barrel, which in themselves form parts of the invention and may be used also in other classes of magazine-guns, although preferably combined with the other features of the invention.

For a full understanding of the invention a detailed description of a construction embodying all the features of the same as applied in their preferred form to a field-gun and a modified magazine construction will now be given in connection with the accompanying drawings, forming a part of this specification, and the features forming the invention will then be specifically pointed out in the claims.

Figure 1 is a side view of a complete gun

in firing position with supporting-tripod and magazine. Fig. 1^a is an enlarged sectional elevation of the upper part of Fig. 1 looking from the line 1^a with the magazine omitted and showing the gun-mounting. Fig. 2 is a side view of the gun with the gun frame and stock broken away and the magazine sectioned to show the mechanism for rotating the magazine and feeding the cartridges, the parts being shown in the position they assume immediately after firing. Fig. 3 is a longitudinal section taken centrally through the barrel and inside the frame or casing for the breech mechanism, the barrel being partially broken away and the magazine omitted, the parts being in the position they assume after the recoil of the parts. Fig. 4 is a similar view showing the barrel returned to position and the breech-block fully withdrawn. Fig. 5 is a similar view showing the breech-block partially returned and forcing a live cartridge into the barrel. Figs. 6 and 7 are horizontal sections taken on the lines 6 and 7 of Fig. 2. Figs. 8 and 9 are cross-sections taken on the lines 8 and 9 of Fig. 2. Fig. 10 is a detail plan view of the trigger and trigger-block. Fig. 11 is a horizontal section of the magazine and casing on the line 11 of Fig. 2, some of the cartridges being omitted to show the cartridge-feeding devices more clearly. Fig. 12 is a partial cross-section of the gun and magazine, taken on the line 12 of Fig. 2, showing the breech-block and cartridge-retaining plates in section. Figs. 13 and 14 are detail sectional plan views showing the mechanism for rotating the magazine in different positions. Figs. 15 and 16 are elevations of a part of the magazine inside the casing, showing the ratchet-teeth with the feeding-pawl in different positions. Figs. 17 to 26 show a modified form of magazine and operating devices. Fig. 17 is a partial horizontal section of the magazine, showing the magazine-rotating devices in plan view. Fig. 18 is a cross-section through the gun and magazine similar to Fig. 12. Fig. 19 is a sectional detail on the line 19 of Fig. 17, showing the magazine-rotating devices. Fig. 20 is a horizontal section of the gun, showing the breech-block in plan view. Fig. 21 is an enlarged detail of the magazine-rotating devices similar to Fig.

17, the parts being shown in a different position. Fig. 22 is a cross-section of the upper part of the gun, taken on the line 22 of Fig. 21, parts being broken away for the purpose of illustration. Figs. 23 and 24 are details of the pawl and pawl-lever. Figs. 25 and 26 are detail plan views of the bottom of the magazine-casing.

In giving a detailed description of the gun I will first describe the breech mechanism of the gun proper, after which similar detailed descriptions will be given of the novel magazine shown and its operating devices and of the tripod construction.

Referring now to the drawings, and especially to Figs. 1 to 10, A is the barrel, and B the barrel-extension, which may be formed integral with or secured to the barrel, and C the breech-block, sliding in the extension. The barrel A and extension B move longitudinally in a frame or casing D, which, as in the form shown, consists of a rectangular casing surrounding the extension B and having an opening 15 at the bottom for the discharge of the empty shells and an opening 16 at the top for the reception of the live cartridges from the magazine. The frame D has a forwardly-extending cylindrical portion E, which surrounds the breech portion of the barrel A and serves as a guide and support for the barrel during its movement. A still further support for the barrel is provided by the sleeve E', hereinafter described. The frame D has also a rearwardly-extending arm or tongue F, which forms the stock or hand-grip. The barrel extension B consists of two side plates 17, joined by a screw-threaded extension, into which the barrel A is screwed, and of a shape conforming to the inner wall of the frame D, in which they fit snugly, said barrel extension B forming a casing inclosing the breech-block and its operating parts and being open at the top and bottom for the reception of the cartridges and expulsion of the shell, as in the case of the frame D.

The breech-block C is provided with ribs 19, which run in grooves formed in the upper part of the sides 17 of the casing forming the extension B and by which the breech-block is guided and held in position. The breech-block also carries on either side the spring-pressed extractors *a*, also running in grooves in the sides of the casing forming the extension B. The ejector *b* is pivoted on pin 21 in the rear end of the casing B and enters a groove 22 in the underside of the breech-block C, the forward portion of the ejector *b* being slightly curved downwardly and the end inclined. The groove at the end of the breech-block *c* is also inclined to conform to the shape of the ejector and press it down to force the shell out of the extractors *a* when the breech-block is in retracted position, as shown in Fig. 4, and the breech-block will rise and pass under the ejector on its return. As the empty shell is drawn back by the extractors *a* when the breech-block C is drawn rear-

ward the upper portion of the head of the shell will pass under the inclined end of the ejector *b*, which is stationary with the barrel extension B, and be pressed down by the curved inclined surface at the end of the breech-block, and thus be forced down out of the grasp of the extractors, when it will fall between the sides 17 of the extension B and through the opening 15 in the frame D. The breech-block C is connected to the barrel extension B by a pair of links K L, pivoted together at 23, the forward end of the front link K being pivoted to the breech-block C by the pivot 24 and the rear end of the rear link L to the barrel extension B by a pivot 25. The link L is preferably forked, as shown, consisting of two side plates, which embrace the rear end of the link K and afford space for a central hammer within the breech-bolt.

Mounted in the forward end of the breech-block C is the firing-pin *c*, which consists of a disk having a pin on its forward side and a central slot through which passes the pin 24, which limits the movement of the firing-pin *c* in both directions. The firing-pin *c* is engaged at its rear end and actuated for firing by a bar *d*, which is practically a part of the firing-pin, but is separate therefrom to allow the link K to turn on the pivot 24. This bar *d* is supported in the link K by a slot-and-pin connection 26 to allow the bar *d* to be forced forward to engage the firing-pin *c*. The bar *d* extends rearward to the end of the link K, and the link L has a similar short bar *d'*, mounted in the link by a pin-and-slot connection, as shown, so as to have a limited movement in the link. This bar *d'* is actuated by the hammer *e* in firing the gun, and in turn actuates the bar *d* to force the firing-pin *c* forward to explode the cartridge. The hammer *e* carries a cross-pin 27, which moves in horizontal grooves 60 in opposite sides of the barrel extension B, being guided thereby in a straight line, and the pin 27 passes through slots 28 in the side plates of the link L. The slots 28 have a horizontal portion, in which the pin 27 lies in the normal position of the gun, and an upwardly-inclined portion, by movement in which the pin 27 breaks down the links for retracting the breech-block. The hammer carries on its lower side a cross-pin 29, adapted to be engaged by the upward extension on the hand-lever H, so that the breech can be readily opened by hand, as described hereinafter. At its rear end the hammer *e* is pivoted by pin 30 between two side plates, which form a lever *f*, which is connected at its lower end to the base of the barrel extension B by links 31, and between the hammer *e* and links 31 the lever is pivotally connected by a pin 32 to two side plates *g g'*, cut away on their lower edges below the pivot 32 to clear the links 31 and adapted to move longitudinally in two grooves 33, formed in the sides 17 of the barrel extension B. The forward ends of the plates *g g'* are entered by the head 34 of

a spring-rod 35, the head 34 having formed on it two lugs 36, which enter openings 37 in the forward ends of the plates *g g'*, as shown in Figs. 3 and 7. The rod 35 has coiled about it a spring 38, one end of which bears against and is held under tension by an adjustable nut 39, screw-threaded on the outer end of the rod 35, the other end of the spring 38 bearing against a head 40, which connects and forms part of the hand-lever bars 41, which extend rearward and are pivoted to the hand-lever H. This spring 38 is the operating-spring of the breech mechanism put under tension by the recoil and by which all the operations of the breech mechanism are performed and the magazine advanced. The spring 38 and rod 35 are inclosed in a casing G, screw-threaded at its inner end to the frame D and secured at its outer end to the under side of the sleeve E' by a screw 42.

The lever *f* has pivoted at 43 between its two side plates a catch-hook *h*, forming the sear by which the hammer is held in firing position and which is released by the trigger, this sear being adapted to engage either one of two teeth 10 11, formed in a catch-block 44. This sear *h* carries a flat curved spring 45 on its upper surface, the free end of which engages the inner curved bearing-surface 46 of the stock F, so that the spring 45 operates to press the sear *h* down into engagement with either one of the two teeth 10 11 for the operation of the gun, as herein-after described. The sear *h* carries a pin 12, adapted to enter a notch 13 in the catch-block 44 when the breech-block C has been retracted, and the sear *h* engages the tooth 10, as shown in Fig. 4, and forms a fulcrum for the rocking of the sear *h* to release it from the tooth 10 as the breech-block returns to close the breech, and as the sear *h* leaves the tooth 10 it is forced by the spring 45 into position to engage with the tooth 11 of the catch-block 44. The sear *h* is thrown out of engagement with the tooth 11 by means of a tripper 48, pivoted to the stock at 49. This tripper 48 has two arms 5 6, the arm 5 entering an opening in the block 44 near the tooth 11 and the upper end of the arm 5 lying directly beneath the sear *h* when the sear is in engagement with the tooth 11. The other arm 6 extends down and forward, with its end in position to be engaged by a pivoted catch on the trigger *l* and by a vertical pin 7, loosely mounted in the trigger-block 50, this pin 7 being the means by which the trigger acts to hold the tripper 48 in position with the sear *h* raised for continuous firing of the gun. The tripper 48 is spring-pressed downward by a spring 51. The tripper 48 is actuated for firing the gun by a swinging catch 52, pivoted at 1 in a groove formed in the trigger *l*, the end 2 of the swinging catch 52 engaging the end of the arm 6 of the tripper 48 to swing the tripper upward on its pivot 49 and raise the arm 5 to release the sear *h* from the tooth 11. The swinging catch 52 carries a pin 3, which en-

ters holes 4 in the side plates of the trigger *l*, the holes 4 being elongated or somewhat larger than the pin 3, thus allowing the catch 52 to be swung upward and downward slightly on the pivot 1. The trigger-spring 8 has a tongue 8^a, forming a light spring-bearing on the top of the catch 52, so as to return it to position with the pin 3 at the bottom of the holes 4. With this construction the pulling of the trigger lifts the tripper by the engagement of the end 2 of the catch 52 with the lower end of the arm 6, so as to release the sear *h* from the tooth 11, and the catch 52 then slips off and passes the arm 6, so as to allow the tripper to be returned to normal position by the spring 51, even though the trigger be held back, thus permitting the sear *h* to engage the tooth 11 when again brought into proper position therefor by the action of the breech mechanism, so as to assure single firing. In raising the arm 6 the catch 52 is swung upward on its pivot 1 against the tension of spring 8, so that the pin 3 is at the top of the holes 4, and when the catch has passed the arm 6 and is thus released the spring 8 swings the catch 52 downward on the pivot 1 until it is stopped by the pin 3 striking the bottom of the holes 4, this downward swinging of the catch carrying its end 2 forward sufficiently to permit it to pass the end of the arm 6 as the trigger is returned by the trigger-spring 8 when released by the finger, and the end 2 of the catch 52 being again brought beneath the arm 6 when the trigger is returned to normal position, so as to engage the arm 6 again on the next pull of the trigger. To prevent the trigger from actuating the pin 7 in single firing, the trigger is provided with a notch 9, directly in line with the pin 7, this notch 9 being deep enough to allow the upward firing movement of the trigger *l* without striking the pin 7. When the gun is used for continuous firing, the notch 9 in the trigger is covered by a plate 53, which is mounted on the trigger and adapted to be moved thereon to cover or uncover the notch 9 by a pin-and-slot connection 14. When the plate 53 is moved to cover the notch 9, the upper end of the plate 53 will engage the lower end of the pin 7 when the trigger is pulled and lift the pin, so as to hold the tripper 48 raised and the sear *h* out of position to engage the catch 11 as long as the trigger is held back. The spring 8, as shown clearly in plan view in Fig. 10, is fast to the trigger-block 50, and besides operating the swinging catch 52 by its central tongue 8^a bears by its front cross-bar on the upper edge of the trigger *l* to return it to position when released by the finger of the operator. In place of the catch construction above described any other suitable device may be used for operating the tripper, such that it will hold and actuate the tripper when the trigger is pulled and permit the trigger-catch to return to position past the tripper for the next firing movement.

Referring now especially to Figs. 1, 2, and

11 to 16, the magazine consists of a stationary outer casing M, circular in form, and an inner rotating cartridge-holder N, in which the cartridges are packed. The casing M consists of an outer cylindrical shell m , bottom m' , and a removable cover m^2 . The bottom m' has a cartridge-opening 99 in line with the feed-opening 16 in the frame D. The bottom m' of the casing M also has rigidly attached to it a central vertical sleeve 70, mounted on a vertical support 80 on the gun-barrel by being slipped over it and screw-threaded at the top to receive a screw 87 on the top m^2 . This holder 80 is formed by a vertical stud on a ring 81, which is the trunnion-ring of the gun, as hereinafter described, and which is screwed onto the end of the barrel guide or support E and receives the screw-threaded end of the sleeve E'. The rear portion of the casing M is supported by the frame D, and its forward portion rests on a block 82, carried by the sleeve E', and is held in proper position and against rotation on the holder 80 by a key or lug 83 on the holder, which enters a notch in the sleeve 70, and by a slotted clip 84 on the rear side of the casing, which is entered by a lug 85 on the rear sight i when the latter is swung up into vertical position on its pivot 120. The rear sight i also carries an arm 121, which bears upon the top of the casing M, so as to hold it firmly against vertical movement. The rear sight may be held in vertical position by any suitable means, such as are well known in the art. As shown in Fig. 19, a vertically-moving catch-pin 122 is used, engaging a notch in the sight-support. The inner casing or holder N has an outer shell n and an inclined top n' , sloping inward to an inner shell n^2 , its central portion being horizontal. Depending from the top n' is a central sleeve 86, journaled on the sleeve 70 of the stationary casing M and supported by shoulders formed on the sleeve 70, so as to be free to rotate thereon. The upper portion of the outer shell n of the holder N is just within the cover M^2 of the casing M, the top n' of the holder N sloping down and inwardly to the inner shell n^2 at about the inclination of the top row of cartridges. The cartridges are placed in the holder, as shown, in radial vertical rows of five, the rows being separated one from the other by radial partitions 88 89, which form stalls receiving the opposite ends of the cartridges, and the bottom cartridge of each row resting on the bottom m' of the casing M. The cartridges are brought at the proper time to the opening 99 in casing-bottom m' and opening 16 in the upper part of the gun-frame D and forced through these openings and in front of the retracted breech-block in the following manner:

Pivotaly mounted on the outer side of the gun-frame D at 90 is a rocking lever J, the lower portion of which is formed of two fingers 91 92, which are alternately engaged by a lug 93, carried by the sliding plate g , the frame D having a slot 94, through which the

lug 93 moves, and the parts being covered by a casing j on frame D. The upper end 95 of the rocking-lever J is circular and projects through a slot 96 in the bottom m' of the casing M and enters an opening in a horizontally-swinging plate I, having a projection forming a pawl 97, which engages teeth formed on the under side of a ratchet-ring 98, fast to the holder N. The plate I is pivoted loosely on a stud 100, rising from the bottom m' of the casing M, and coiled about the stud 100 is a spring 101, one end of which is fast to the plate I and the other end is connected by a link 102 to a swinging cartridge-guide 103, which is pivoted at 104 to the under side of a table 105, so as to swing below the latter over the opening 99. The table 105 extends rearward relatively to the movement of the holder N from a point in advance of the opening 99 and is arranged with its rear edge on the line between the first and second layers of cartridges, so as to allow only the lower layer of cartridges to pass to the opening 99, the second layer passing over the upper surface of the table and gradually falling to the bottom of the casing M over the inclined table-support 124, so that the second layer as the cartridges approach the table is advanced over the top of the table and after passing the table becomes the first or bottom layer from which the gun is fed, and so on for each successive layer.

The spring 101 is normally under tension to hold the pawl 97 against one of the teeth of the ring 98, and when the plate I is swung to the position shown in Fig. 14 to move the holder N forward the tension of spring 101 will be slightly increased by reason of the link 102 and swinging arm 103, which at this time are given a greater movement than the plate I by the forward cartridge of the bottom layer, which is being moved to a position over the opening 99, pressing against the swinging arm 103 and forcing it forward or away from over the opening 99. The guide 103 is pivoted in such a position that it will normally lie across the opening 99 at an angle, as shown in Fig. 13, and when the holder N is moving and the cartridge next the opening 99 is being moved over the opening it will press the swinging guide 103 back to the position shown in Fig. 14 against a block 107, and the underside of the guide 103 is curved or inclined, so that the guide 103 acts to force the cartridge down through the openings 99 16 as the spring 101 acts through link 102 to move the guide back to the position shown in Fig. 13. The cartridge passes through the openings 99 16 from the position shown in Fig. 12 and down in front of the breech-block C, when the latter is retracted and is caught and prevented from falling out of the path of the returning breech-block by two curved supports or holding-plates s , (shown in Figs. 4 and 12,) which catch the rear portion of the cartridge and support it while the forward end is supported by a rest 106 in

position to be forced into the barrel, this rest 106 forming part of the barrel extension B and supporting also the forward end of the breech-block when the breech is closed. In 5 Fig. 12 a cartridge is shown in full lines in the position it occupies in the openings 99 16 during the withdrawal of the breech-block and in dotted lines after it has been pressed down by guides 103 in front of the retracted 10 breech-block. A follower O, resting on the top of the cartridges, is also provided for the following purpose: When the magazine has been emptied, with the exception of the last layer on top of the table 105, the cartridges 15 in moving over the edge of the table 105 while the holder is being rotated may rebound, and to prevent this the ring O, preferably formed of a comparatively wide plate, as shown, is hung on the magazine in such a 20 manner that it will follow the cartridges downward as they move toward the bottom of the holder and press upon them to prevent rebound and secure their proper feed. For this purpose I suspend the ring O by links 100 25 from the top n' of the holder N, as shown in Figs. 2 and 11, the links being of the proper length and arranged to allow the ring O to lower with the layer of cartridges in the magazine on which it rests, so that the ring holds 30 the cartridges down and thus assures the last layer passing over the edge of the table without rebound.

With the construction above described, when the gun has been discharged and the 35 barrel and breech-block, with their operating parts, have by the recoil been forced back to the position shown in Fig. 3 the lug 93 will have engaged the finger 91 of the rocking lever J and thrown the lever J to the position 40 shown in dotted lines in Figs. 2 and 3, withdrawing the pawl 97 into the position shown in Fig. 13. Then as the links K L are broken down and the sliding plate g is moved forward by the tension of the operating-spring 45 38 the lug 93 is moved from the dotted position shown in Fig. 3 forward to the dotted position shown in Fig. 4 without actuating lever J, but is then in position to engage finger 92 and actuate the lever on further move- 50 ment of the plate g , and such further movement occurs during the return of the links and breech-block to normal position. The moving of the lever J during this return of the breech-block will through the end 95 swing the plate I in the direction of the arrow in Fig. 13 to the position shown in Fig. 14, and the plate I will through the pawl 97, which engages the toothed ring 98, fast to the 55 holder N, move the holder a space of one tooth—that is, the distance between the center of two cartridges. This movement of the holder will bring a cartridge over the openings 99 16, and the guide 103 will force the cartridge partially through these openings onto 60 the top of the breech-block, which is then in its normal position, closing the breech. The fingers 91 92 are formed on their lower sur-

face so as to allow the lug 93 to pass under them when the lever J has obtained sufficient movement and act as a lock to prevent swing- 70 ing of the lever J. I preferably provide a two-leaved spring-plate z , fastened to the bottom m' of the casing M, one leaf 108 of which engages a tooth of the ring 98 to prevent over-throw and also to press the pawl 97 into en- 75 gagement with the tooth 98 next to be engaged as it returns to engaging position, and the other leaf 108^a engages a tooth 98 to prevent a backward movement of the magazine, as shown in Figs. 15 and 16. 80

Figs. 17 to 26 show a modified construction of the magazine and means for rotating the holder N. In this case the lever J is dispensed with and the pawl 97 forms a part of a lever 110, having a vertical slot entered by 85 a bar 111, having on its lower surface two studs 112 and 113 and on its upper surface a stud 114. This lever 110 is mounted in an opening 115 in the under side of the sight-block 116 and normally pressed against the 90 upper surface of the opening 115 by a spring 117, carried by the lever and bearing on the gun-frame D. The bar 111 is journaled in the sight-block 116 and the upper face of the frame D by the studs 112 114, and the stud 95 113 runs through a slot 118 in the frame D and enters a cam-groove 119 in the upper face of the breech-block C. When the breech is closed, the pin 113 lies in the position shown in dotted lines in Fig. 20, and as the breech- 100 block is retracted the pin 113 will be actuated by the cam-groove 119 to the position shown in full lines in Fig. 20, and thus throw the bar 111, and consequently the pawl 97, which engages the teeth 98, from the position shown 105 in Fig. 21 to the position shown in Fig. 17 and bring a cartridge over the opening 99 under the table 105. In this construction the movable guide 103 is omitted and the table 105 is slightly inclined toward the opening 99 110 and curved about the opening, as shown clearly in Fig. 18, so as to form a guide and act to press the cartridge down into the gun as it arrives over the opening. As the breech- 115 block moves forward to close the breech the cam 119 will operate to move the pawl 97 in the opposite direction, the spring 117 allowing the end of the pawl to lower as it moves along the incline of the tooth 98 until it passes the point of the tooth and then raising 120 the pawl to engage the tooth. It will be seen from this that the lever 110 has a slight rocking movement on the bar 111, and as the lever is held against the upper surface of the sight-block the rear end of the lever 110 is 125 slightly rounded or curved, so as to allow the lever to tilt slightly as the pawl 97 is forced down by the incline of the teeth 98. A plate or cover w , as shown in Fig. 26, may be used for closing the opening 99 when desired for 130 any purpose, as for re-serving the magazine.

The construction shown in Figs. 17 to 26 is otherwise the same as that shown in the other figures and previously described. To refill

either of the magazines, the rear sight *i* is turned down and the magazine, including casing *M*, raised off the support 80. The cover *m*² of the casing *M* is then removed and holder *N* drawn off the sleeve 70 and placed top down and refilled. The casing *M* is then placed over the filled holder and the casing and holder then turned top up and the cover *m*² replaced, when the entire magazine may be replaced on the gun, as before.

The gun may be mounted in any suitable manner; but I preferably use a tripod *X*, (shown in Figs. 1 and 1^a), the legs of which are attached at the upper end to a head 71, in which the gun is hung by trunnions 72 on trunnion-ring 81, previously described. The trunnion-box on the head 71 is composed of an externally-screw-threaded hub 73, the upper part of which is removable to allow the trunnions to be placed in the trunnion-box. A ring 74 is then screwed on over the trunnion-box 73, and a two-part cap-plate 75 is fastened to the end of trunnion 72 by screws or otherwise, thus preventing any dust or dirt from entering the trunnion-box. With this construction the parts are such that they can be readily renewed when broken or worn.

A handle and shoulder rest *P* is shown which is screwed onto a projection on the stock of the gun for convenient removal. The rear leg *x* of the tripod is pivoted at the upper end to the head 71 and consists of a tube which receives the bar *x'*, adjustable in the tube so as to lengthen or shorten the leg. The lower end of the tube *x* is shown as split and encircled by a clamp 76, which clamps it tightly to the rod *x'*. An adjusting-clamp 77 on the tube *x* is connected by a chain 78 to the head 71. The other two tripod-legs *y y* carry at their upper ends intermeshing geared segments 79, so that they move outward or inward together. The tripod may be adjusted so that the gun is fired from a high position or close to the ground. As shown in Fig. 1, the gun is raised. When the gun is to be lowered, the clamp 77 is moved upward on the leg *x* toward the head 71, and the chain 78 is thus slackened, allowing leg *x* to be swung away from legs *y* as far as desired. A seat *V* is mounted on the rear leg *x*, its front end being supported on the leg by clamp 126 and its rear end by link 127, connected to clamp 128 on the leg *x*. The seat may thus be adjusted to any desired position of use by moving the clamps 126 128, or the seat and link 127 may be closed against the leg *x* for packing.

The operation of the gun will be understood from a brief general description in connection with the description of the parts heretofore given and the drawings, referring also to Letters Patent No. 584,153.

Assuming that the parts are in the position shown in Fig. 2 and that the gun has just been discharged, the recoil carries the barrel *A* and barrel extension *B* rearward together to the limit of the recoil movement, as shown

in Fig. 3, the breech-block *C* moving with the barrel and barrel extension *B*. This movement of the barrel and barrel extension forces the lever *f* backward bodily by the connection of the upper end of the lever to the barrel extension *B* and the connecting-link 31 between the lower part of the barrel extension and the lever *f*. The lever *f* is thus moved back until the sear *h* engages the tooth 10 in the catch-block 44, and the spring 38 is thus compressed against the head 40 by the plates *g g'* moving back with the lever *f*. During this movement the links *K L* are held in normal position and the breech-block *C* locked to the barrel by the pin 27 moving in slot 60 and the straight portion of slot 28, so that the barrel extension *B* receives the full force of the recoil. When the force of the recoil is expended and the barrel free to return, the spring 38 will recoil, and as the lever *f* is held by the sear *h* and tooth 10 of the catch-block 44 the lever *f* will be operated as a lever with its fulcrum at the pivot 43 and the lower end thrown forward and its upper end rearward as the plates *g g'* are returned by spring 38 toward their normal position, and by this action the lower end of the lever *f* actuates the barrel extension *B* through link 31 and returns the barrel to its normal position, at the same time throwing backward the upper end of the lever *f* to throw back the hammer *e*, which is connected thereto by pin 30. The pin 27 of the hammer *e* travels in the straight portion of the slot 28 for a short distance during this movement and then enters the inclined portion of the slot and breaks down the links *K L*, and the link *L* is then actuated as a lever with its fulcrum at 25 and the power applied by the pin 27 and through the link *K*, connecting the other end of this lever *L* to the breech-block *C*, draws the latter back to open the breech as the barrel reaches its normal position. When the breech-block is nearly withdrawn and the barrel is nearly returned to position, so that the breech is open for the discharge of the shell and the insertion of the cartridge, the forward end of the ejector *b* strikes the head of the cartridge-shell held by the extractors *a* and forces it out of the grasp of the extractors and down and out of the opening 15 of the frame *D*. The parts are now in the position shown in Fig. 4. During these operations of the different parts the magazine-actuating lever *J* has been moved by the plate *g*, lug 93, and finger 91 of the lever *J* from the position shown in full lines in Fig. 2 to the position shown in dotted lines in the same figure and in Fig. 3, and the pawl 97 of the plate 1 thus moved backward into position to engage a tooth on the ratchet 98, which occurs when the parts are as shown in Fig. 3, the position of the lever *J* at that time being shown in dotted lines in this figure, the lug 93 running under the finger 91 during the latter part of this movement, so as to lock the lever *J* in position. Fig. 13 shows this position of the pawl. As

the spring 38 in its recoil operates to return the barrel A to normal position and to break down the links K L, to withdraw the breech-bolt from the barrel and open the breech, as previously described, and to bring the parts into the position shown in Fig. 4, the forward movement of the plate *g* carries the lug 93 from under the finger 91 and into position to engage the finger 92, as shown in dotted lines in Fig. 4, but does not actuate the lever J. During this movement of the breech-block the cartridge that has entered the openings 99 16 and is then in the position shown in full lines in Fig. 12 lies upon the top of the breech-block, and the spring 101, which has been put under increased tension by the backward movement of the plate I, as above described, presses the curved-surface guide 103 so as to tend to force the cartridge downward. As the breech-block reaches its rear position and the breech is fully opened the support of the cartridge by the breech-block is withdrawn and the cartridge passes down through opening 16 into the position shown in Fig. 5, in which it is supported throughout the rear portion by the plates *s* and at the point by the support or rest 106. The cartridge is moved downward through opening 16 not only by gravity, but by the pressure of spring 101 upon guide 103, so that the latter acts to force the cartridge down with a quick spring movement. The guide 103 is thus moved over the opening 99 and into the position shown in Fig. 13, so as to close the opening, but yield, as before described, for the feed of the next cartridge. The barrel is now in normal position, the breech fully open, and a cartridge in position for loading, the next movement being for the return of the breech-block to close the breech. The sear *h* is now rocked upon the point of the pin 12, resting in the notch 13 on block 44, so as to raise the sear-hook out of engagement with tooth 10 on block 44 against the tension of spring 45, and as the sear is released from the tooth 10 the spring 38, acting through the plates *g g'* upon the lever *f*, rocks the lever *f* forward upon the pivot formed by its connection to the link 31, the connection of the link 31 to the barrel extension B being now stationary, as the barrel has returned to normal position, and the hammer *e* is thus moved forward by the upper end of the lever *f*, so as to swing the links K L upward by the pin 27 acting in the slot 28 in link L, and thus open the links and return the breech-block to position to close the breech, the breech-block during this movement engaging the head of the cartridge and moving it forward into the barrel, with the extractors grasping the rim of the cartridge-shell, as usual. The position of the parts with the breech-block C partially returned and just engaging the head of the cartridge supported by the plates *s* to move it forward into the barrel is shown in Fig. 5. During this return movement of the breech-block the

sear-hook moves over the top surface of the catch-block 44, between the catches 10 11, and is pressed downward by the spring 45 into position to engage the catch 11 and hold the hammer *e* back from the forward end of the slot 28, so as to permit a slight forward movement of the hammer sufficient to actuate the firing-pin for the discharge of the gun when the sear is released from the catch 11, as previously described. When the breech-block has been fully returned to position to close the breech, the breech-block is locked in position by the pin 27 in the straight portion of the slot 28 and all the parts are in the position shown in full lines in Fig. 2, except that the hook of the sear *h* is in engagement with the forward catch 11 of block 44, and the hammer *e* and upper end of the lever *f* are thus held back correspondingly, as indicated in dotted lines in Fig. 2. During this return movement of the breech-block the lug 93 engages and actuates the finger 92 of lever J, and thus rocks the lever J from the position shown in Figs. 3 and 4 to that shown in full lines in Fig. 2, which movement of the lever J, through the projection 95, actuates the pawl 97 to move from the position shown in Fig. 13 to that shown in Fig. 14, and thus rotate the holder N to carry a cartridge over the openings 99 16, and this cartridge then falls and is pressed downward partially through these openings by the guide 103 and into the position shown in full lines in Fig. 12, resting upon the breech-block. The parts are now in position for the discharge, and upon the pulling of the trigger *l* the tripper 48 will be swung upward and the sear *h* released from the tooth 11 by the tripper-arm 5; when the spring 38, which has been held from full return by the engagement of the sear *h* with the catch 11, will rock the lever *f* forward from the position shown in dotted lines in Fig. 2 to the position shown in full lines in the same figure, and thus through hammer *e*, bars *d' d*, and pin *c* explode the cartridge, when the operation above described will be repeated.

The above description applies to the operation of the gun in single firing, with the plate 53 moved down on the trigger *l* into the position shown in the drawings, so as to uncover the opening 9 and prevent the movement of the pin 7 by the trigger. The operation in continuous firing is the same except that the plate 53 is moved upward on the trigger to cover the opening 9, so that the pin 7 is raised by the engagement of the plate 53 therewith as long as the trigger is held back and the arm 5 of tripper 48 thus held in the position to prevent the engagement of the sear *h* with the catch 11 as the parts reach the position shown in dotted lines in Fig. 2, with the result that the sear passes the catch 11 and the lever *f* and hammer *e* are moved forward automatically into the position shown in full lines in Fig. 2 and the cartridge exploded for the next discharge. This operation will be repeated as long as the trigger is held back

until the cartridges in the magazine are exhausted.

To load the gun by hand, the handle end of the hand-lever H is thrown forward, thus moving the upper part or fork of the hand-lever H rearward to engage the pin 29 of the hammer *e* and move the hammer rearward, thus rocking the lever *f* rearward upon its pivot to the link 31 to break the links K L downward and withdraw the breech-block to open the breech, this movement also withdrawing the plates *g g'*, so as to actuate the lever J and cartridge-holder N to feed a cartridge in the same manner as previously described, and the hand-lever H is then thrown rearward to move the hammer *e* back and move the breech-block forward to close the breech, the sear *h* then engaging the catch 11 on block 44 to hold the hammer cocked in the same manner and the cartridge being carried into the barrel by the returning breech-block, all as previously described. The hand-lever is thus operated without compressing the spring 38, as the spring 38 bears against the head 40 of the handle-lever bars 41, and this head 40 moves with the handle-lever H, so that the tension of the spring 38 is thus equalized by the corresponding movement of the head 40 and the plates *g g'* in the rearward movement of these members, while the head 40, acting upon the spring 38, pulls the plates *g g'* forward to actuate the lever *f* and close the breech as the hand-lever is returned to normal position. It is obvious from the drawings that the hand-lever is locked in normal position when fully returned by the bars 41 and head 40 abutting against the spring 38. The hammer may be uncocked by hand by throwing the hand-lever H so that its upper end by engagement with the pin 29 holds the hammer *e* back against the tension of spring 38, then pulling the trigger to release the sear *h* and allowing the hammer to move forward against pressure on hand-lever H.

While the magazine construction shown and means for operating the magazine are especially adapted for use in recoil-operated guns, and the invention consists in part of combinations, including features of construction in such guns, my especial object being to provide an improved automatically-operated gun with a magazine of large capacity and efficient in operation, it will be understood that many features of this magazine construction and means for operating the magazine are applicable also in connection with hand-operated magazine-guns and are thus claimed. This magazine construction also may be used in other classes of recoil-operated guns than those employing the breech-movement shown, and my improvements in the gun mechanism also may be used with other means for holding and feeding the cartridges, although the parts of the invention relating to the breech mechanism and magazine construction are preferably

combined, as shown, and are especially adapted for use together.

It will be understood that the invention is applicable to other classes of guns, as well as machine or field guns, and that the form and arrangement of many of the parts shown may be varied widely. The invention, therefore, is not to be limited to the exact construction shown, as many modifications may be made therein by those skilled in the art without departing from the invention.

What is claimed is—

1. The combination with a longitudinally-movable barrel actuated by the recoil, of a breech-block, links connecting said breech-block and barrel, means for returning the barrel to position after recoil, a member engaging the rear link, a lever connected to said member, a swinging hook carried by said lever and adapted to engage a stationary catch to hold the lever during the return movement of the barrel and lifted from the catch for the return of the breech-block, and means for rocking said lever on its pivot to said hook to actuate said member to withdraw the breech-block and for returning the lever to normal position to actuate said member to close the breech when the hook is tripped, substantially as described.

2. The combination with a longitudinally-movable barrel actuated by the recoil, of a breech-block, links connecting said breech-block and barrel, a member connected to the rear link between its pivots, a lever connected at different points to the member and barrel, a recoil-pressure device connected to said lever and a swinging hook carried by said lever and adapted to engage a fixed catch to form a fulcrum for the lever during the return of the barrel and lifted from the catch for the return of the breech-block, substantially as described.

3. The combination with a longitudinally-movable barrel actuated by the recoil, of a breech-block, links connecting said breech-block and barrel, a member having a sliding connection with the rear link and forming a hammer, a lever connected at different points to the member and barrel, a recoil-pressure device connected to said lever, a swinging hook on said lever forming a fulcrum for the lever during a withdrawal of the breech-block and a sear to hold the hammer cocked, two fixed catches adapted to be engaged by the swinging hook, means for lifting the hook from the rear catch for the return of the breech-block, and a trigger and connections for lifting the hook from the other catch for firing the gun, substantially as described.

4. The combination with a longitudinally-movable barrel actuated by the recoil, of a breech-block, links connecting said breech-block and barrel, a member connected to the rear link between its pivots, a lever connected at different points to the member and barrel, a recoil-pressure device connected to said

lever, and a swinging hook carried by said lever and adapted to engage a fixed catch to form a fulcrum for the lever during the return of the barrel, and a fulcrum for the hook on which it is rocked by the lever to release it from the catch for the return of the breech-block, substantially as described.

5. The combination with a longitudinally-movable barrel actuated by the recoil, of a breech-block, links connecting said breech-block and barrel, a member having a sliding connection with the rear link and forming a hammer, a lever connected at different points to the member and barrel, a recoil-pressure device connected to said lever, a swinging hook on said lever forming a fulcrum for the lever during the withdrawal of the breech-block and a sear to hold the hammer cocked, two fixed catches adapted to be engaged by the swinging hook, a fulcrum for the hook on which it is rocked by the lever to release it from the catch for the return of the breech-block, and a trigger and connections for tripping the hook from the other catch for firing the gun, substantially as described.

6. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward and directly into position to be advanced longitudinally into the barrel and means for automatically rotating said magazine and delivering the cartridges, substantially as described.

7. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, means for automatically rotating said magazine and delivering the cartridges, and a stationary cartridge-support to which the cartridge is delivered from the holder in position to be advanced longitudinally from the support into the barrel, substantially as described.

8. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, means for automatically rotating said magazine and delivering the cartridges, and side plates within the breech arranged to receive a cartridge from the magazine and support it in position to be advanced from the plates longitudinally into the barrel, substantially as described.

9. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, means for automatically rotating said magazine and delivering the cartridges, side plates within the breech above the line of movement of the empty shell arranged to receive a cartridge from the magazine and support it in

position to be advanced from the plates longitudinally into the barrel, and a rest for the point of the cartridge below the barrel, substantially as described.

10. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, means for automatically rotating said magazine and delivering the cartridges, side plates within the breech above the line of movement of the empty shell arranged to receive the head portion of a cartridge delivered from the magazine and support it in position to be advanced from the plates longitudinally into the barrel, and a rest for the point of the cartridge below the barrel, substantially as described.

11. The combination with a recoil-operated gun, of a magazine above the breech having a horizontally-rotating cartridge-holder and a bottom discharge-opening, means for automatically rotating said cartridge-holder and delivering the cartridges through the discharge-opening, a vertical cartridge-opening through the breech in line with said discharge-opening and the barrel, a support above the line of movement of the empty shell to which the cartridge is delivered from the holder in position to be advanced longitudinally into the barrel, and means for ejecting the empty shell downward, substantially as described.

12. The combination with a recoil-operated gun having a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward and directly into position to be advanced into the barrel by the breech-block, and means for automatically rotating said magazine and delivering the cartridges from the magazine, substantially as described.

13. The combination with a recoil-operated gun having a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, and a cartridge-support to which the cartridge is delivered from the magazine in front of the breech-block, and means for automatically rotating the magazine and delivering the cartridges from the magazine, substantially as described.

14. The combination with a recoil-operated gun having a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, and side plates arranged to receive a cartridge from the magazine and support it in front of the breech-block, and means for automa-

ically rotating the magazine and delivering the cartridges from the magazine, substantially as described.

15 The combination with a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are delivered downward, side plates above the
10 line of movement of the empty shell arranged to receive a cartridge from the magazine and support it in front of the breech-block, and a rest for the point of the cartridge below the barrel, substantially as described.

15 16. The combination with a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating cartridge-holder from which the cartridges are
20 delivered downward, and spring-plates at opposite sides of the breech-chamber above the line of movement of the empty shell arranged to receive a cartridge from the magazine and support it in front of the breech-block, sub-
25 stantially as described.

17. The combination with a breech-block movable in line with the barrel to open and close the breech, of a magazine above the breech having a horizontally-rotating car-
30 tridge-holder from which the cartridges are delivered downward, spring-plates at opposite sides of the breech-chamber above the line of movement of the empty shell arranged to receive a cartridge from the magazine and
35 support it in front of the breech-block, and a rest for the point of the cartridge below the barrel, substantially as described.

18. In a recoil-operated gun, the combination with a longitudinally-movable barrel, of
40 a movable magazine actuated after the barrel is returned to normal position, substantially as described.

19. In a recoil-operated gun, the combination with a longitudinally-movable barrel, of
45 a horizontally-rotating magazine above the breech, and means for advancing the magazine intermittently after the return movement of the barrel, substantially as described.

50 20. In a recoil-operated gun, the combination with a longitudinally-movable barrel and a breech-block withdrawn to open the breech during the return movement of the barrel, of
55 a horizontally-rotating magazine above the breech, and means for advancing the magazine intermittently for the delivery of a cartridge when the breech is open, substantially as described.

21. In a magazine-gun, the combination
60 with a horizontally-rotating cartridge-holder having a circular series of teeth in its under side, of a pawl engaging said teeth, means for actuating said pawl to advance the cartridge-holder intermittently, a catch engag-
65 ing said teeth and forming a stop to prevent overthrow of the holder, and a catch engag-

ing said teeth and forming a stop to prevent rebound of the holder, substantially as described.

22. The combination with a horizontally-rotating cartridge-holder, of a lever actuated
70 by a reciprocating member and connected to advance said holder intermittently, and said reciprocating member and lever being ar-
75 ranged to lock the lever in position at the end of its movement, substantially as described.

23. In a magazine-gun, the combination with a magazine having a horizontally-rotating cylindrical cartridge-holder with the car-
80 tridges arranged therein in vertical rows, and a bottom discharge-opening, of a table projecting rearward of the holder from the forward side of the discharge-opening above one
85 or more cartridges of the bottom layer rearward of the opening and arranged to support the upper cartridges in one or more vertical rows rearward of the discharge-opening while
90 the bottom layer is fed beneath the table to the discharge-opening, substantially as described.

24. In a magazine-gun, the combination with a magazine having a horizontally-rotating cylindrical cartridge-holder with the car-
95 tridges arranged therein in vertical rows, and a bottom discharge-opening, of a table projecting rearward of the holder from the forward side of the discharge-opening and ar-
100 ranged to support the upper cartridges while the bottom layer is fed beneath the table to the discharge-opening, and a follower acting upon the top of the cartridges, substantially as described.

25. In a magazine-gun, the combination with a magazine having a horizontally-rotating cylindrical cartridge-holder with the car-
105 tridges arranged therein in vertical rows, and a bottom discharge-opening, of a table projecting rearward of the holder from the forward side of the discharge-opening above one
110 or more cartridges of the bottom layer rearward of the opening and arranged to support the upper cartridges in one or more vertical rows rearward of the discharge-opening while
115 the bottom layer is fed beneath the table to the discharge-opening, and a curved cartridge-guide beneath the table, substantially as described.

26. In a magazine-gun, the combination with a magazine having a horizontally-rotating cylindrical cartridge-holder with the car-
120 tridges arranged therein in vertical rows and a bottom discharge-opening, of a table projecting rearward of the holder from the forward side of the discharge-opening and ar-
125 ranged to support the upper cartridges while the bottom layer is fed beneath the table to the discharge-opening, and a spring-pressed curved cartridge-guide beneath the table
130 pressing against the cartridges to secure their delivery through the opening, substantially as described.

27. In a magazine-gun, the combination

with a magazine having a rotating cartridge-holder and radially-arranged cartridges therein, and a bottom discharge-opening, of a spring-pressed curved cartridge-guide arranged on the forward side of the discharge-opening in the path of movement of the cartridges and pressing against the cartridges to secure their delivery through the opening, substantially as described.

28. In a cartridge-magazine, a bottom plate having a discharge-opening detachably supported on the gun in a fixed position and a cartridge-carrier intermittently rotated to bring successive cartridges over said opening and having open vertical cartridge-chambers, substantially as described.

29. In a cartridge-magazine, a fixed cylindrical casing having a bottom discharge-opening and a cartridge-carrier inclosed within said casing and intermittently rotated to bring successive cartridges over said opening and having open vertical cartridge-chambers, substantially as described.

30. In a cartridge-magazine, a fixed cylindrical casing having a bottom discharge-opening, and a cartridge-carrier inclosed within said casing and intermittently rotated to bring successive cartridges over said opening and having open vertical cartridge-chambers each adapted to contain a plurality of cartridges, and a guide extending over the discharge-opening and beneath which the cartridges of the bottom layer are fed to the opening, substantially as described.

31. In a cartridge-magazine, a bottom plate having a discharge-opening detachably supported on the gun in a fixed position and a cartridge-carrier inclosed within said casing and intermittently rotated to bring successive cartridges over said opening and having open vertical cartridge-chambers each adapted to contain a plurality of cartridges, and a guide extending over the discharge-opening and beneath which the cartridges of the bottom layer are fed to the opening, substantially as described.

32. A cartridge-magazine including a cylindrical casing adapted to be secured in a fixed position and having a bottom discharge-opening, a cylindrical cartridge-holder within said casing having open vertical cartridge-chambers each adapted to contain a plurality of cartridges and adapted to be rotated within the casing to bring successive cartridges over the discharge-opening, substantially as described.

33. A cartridge-magazine including a cylindrical casing adapted to be secured in a fixed position and having a bottom discharge-opening, a cylindrical cartridge-holder within said casing having open vertical cartridge-chambers each holding a series of cartridges and adapted to be rotated within the casing to bring successive cartridges over the discharge-opening, and a cartridge-guide extending over

the discharge-opening, substantially as described.

34. A cartridge-magazine including a cylindrical casing adapted to be secured in a fixed position and having a bottom discharge-opening, a cylindrical cartridge-holder within said casing having open vertical cartridge-chambers each holding a series of cartridges and adapted to be rotated within the casing to bring successive cartridges over the discharge-opening, and a table extending rearward over the discharge-opening above the bottom layer of cartridges and providing space in advance of the opening beneath the table for the holder-actuating devices within the casing, substantially as described.

35. Magazine-casing M having bottom plate *m'* with discharge-opening 99 adapted to be removably secured in a fixed position on a gun, removable cartridge-holder N within said casing, and removable cover *m*², substantially as described.

36. Magazine-casing M having bottom plate *m'* with discharge-opening 99 adapted to be removably secured in a fixed position on a gun, vertical cylindrical hub 70, removable rotatable cartridge-holder N on said hub, and removable cover *m*², substantially as described.

37. The combination with vertical support 80, and a magazine mounted on said support, of pivoted sight *i* having connection 84, 85 with the side of the magazine, substantially as described.

38. The combination with vertical support 80, and a magazine mounted on said support, of pivoted sight *i* having connection 84, 85 with the side of the magazine, and arm 121 engaging the top of the magazine, substantially as described.

39. A magazine having an outer cylindrical casing with a removable cover and a bottom discharge-opening, and a rotatable cartridge-holder within said casing open at the bottom for the receipt and delivery of cartridges, substantially as described.

40. The combination with the rotating cartridge-holder N, and table 105, of the follower O, substantially as described.

41. The combination with the cartridge-holder N having teeth 98, and pawl 97 for rotating said holder, of spring 108 pressing said pawl into engagement with the teeth and acting as a stop-pawl to prevent overthrow, substantially as described.

42. The combination with the rotating cartridge-holder N, of curved spring-pressed guide 103 above the discharge-opening, substantially as described.

43. The combination with the rotating cartridge-holder N, of curved spring-pressed guide 103 above the discharge-opening, and table 105 extending over the discharge-opening and guide, substantially as described.

44. The combination with the rotating car-

tridge-holder N, of curved guide 103, arranged on the forward side of the discharge-opening in the path of movement of the cartridges and a spring acting to press said guide toward the cartridges and controlled by the holder-actuating mechanism, substantially as described.

45. The combination with a holder N, of guide 103, holder-actuating lever I, and spring 101 having one end connected to the lever and the other to the guide, substantially as described.

46. The combination with magazine-actuating lever J having fingers 91, 92, of reciprocating lug 93 engaging said fingers to move the lever in opposite directions and passing under the fingers at the end of the lever movement, substantially as described.

47. The combination with the longitudinally-movable barrel, links K, L, hammer *e*, lever *f* and link 31, of recoil-spring 38 and its connection to the lever *f*, stationary catches 10, 11, and sear *h* pivoted on the lever and engaging the catches and lifted from catch 10 for the return of the breech-block, substantially as described.

48. The combination with the longitudinally-movable barrel, links K, L, hammer *e*, lever *f* and link 31, of recoil-spring 38 and its connection to the lever *f*, stationary catches 10, 11, sear *h* pivoted on the lever and engaging the catches, and a fulcrum for the sear on which it is rocked by lever *f* to release it from catch 10, substantially as described.

49. The combination with the longitudinally-movable barrel, links K, L, hammer *e*, lever *f* and link 31, of recoil-spring 38 and its connection to the lever *f*, stationary catches 10, 11, sear *h* pivoted on the lever and engaging the catches and tripped from catch 10 for the return of the breech-block, and tripper 48 for lifting the sear from catch 11, substantially as described.

50. The combination with the longitudinally-movable barrel, links K, L, hammer *e*, lever *f* and link 31, of recoil-spring 38, forward of the lever *f* and plates *g*, *g'* connecting it to the lever, stationary catches 10, 11, sear *h* pivoted on the lever and engaging the catches for holding and forming a fulcrum for the lever *f*, a fulcrum for the sear on which it is rocked by the lever *f* to release it from catch 10, and means for raising the sear from catch 11 to release the lever, substantially as described.

51. The combination with the longitudinally-movable barrel, links K, L, hammer *e*, lever *f* and link 31, of recoil-spring 38 and its connection to the lever *f*, stationary catches 10, 11, sear *h* pivoted on the lever and engaging the catches, a fulcrum for the sear on which it is rocked by lever *f* to release it from catch 10, and a spring 45 pressing the sear into engagement with the catches, substantially as described.

52. The combination with a recoil-operated

breech movement having recoil-spring 38, of a hand-lever H for operating said breech mechanism, head 40 forming an abutment for the recoil-spring, and link 41 connecting said head to the hand-lever, substantially as described.

53. In a recoil-operated gun, the combination with a member connected to the breech-block, of recoil-spring 38, sliding plates *g*, *g'* connected to said member, and spring-rod 35 having head 34 connecting and operating said plates, substantially as described.

54. The combination with a breech-block and extractors carried thereby engaging the opposite sides of the cartridge-shell, of an ejector having an inclined surface and means for actuating said ejector to engage the edge of the rim of the cartridge-shell by said inclined surface as the shell is withdrawn by the breech-block, said inclined surface being arranged to force the rim through the extractors in a line parallel with the holding-surface of the extractors, substantially as described.

55. The combination with a breech-block and extractors *a* on opposite sides of the shell, of ejector *b* having an inclined surface and means for actuating said ejector to engage the top edge of the cartridge-shell rim as the shell is withdrawn by the breech-block, said inclined surface being arranged to force the cartridge downward and out of the extractors in a line parallel with the holding-surface of the extractors, substantially as described.

56. The combination with pivoted ejector *b*, of sliding breech-block C having extractors on opposite sides of the shell and a curved or inclined surface engaging said ejector as the breech-block is withdrawn, said ejector having an inclined surface engaging the edge of the rim of the cartridge-shell as the shell is withdrawn by the breech-block and arranged to force the shell out of the extractors in a line parallel with the holding-surface of the extractors, substantially as described.

57. The combination with a movable breech-block, and means for introducing a cartridge from above, of side plates *s* above the path of movement of the empty shell and arranged to receive the cartridge and hold it in position to be pushed into the barrel by the breech-block, substantially as described.

58. The combination with a movable breech-block, and means for introducing a cartridge from above, of side plates *s* above the path of movement of the empty shell and arranged to receive the cartridge and hold it in position to be pushed into the barrel by the breech-block, and rest 106 for the point of the cartridge, substantially as described.

59. The combination with a movable breech-block, and means for introducing a cartridge from above, of side plates *s* above the path of movement of the empty shell and arranged to receive the cartridge and hold it in position to be pushed into the barrel by the breech-

block, and ejector *b* for discharging the empty shell downward, substantially as described.

60. The combination with a tripper, of trigger *l* with pivoted catch 52 having a limited movement thereon, pin 7 for holding the tripper by the trigger, and plate 53 adjustable on the trigger into and out of position to engage said pin, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HOWARD CARR.

Witnesses:

WILLIAM C. PRICE,
HOLLAND SMITH.