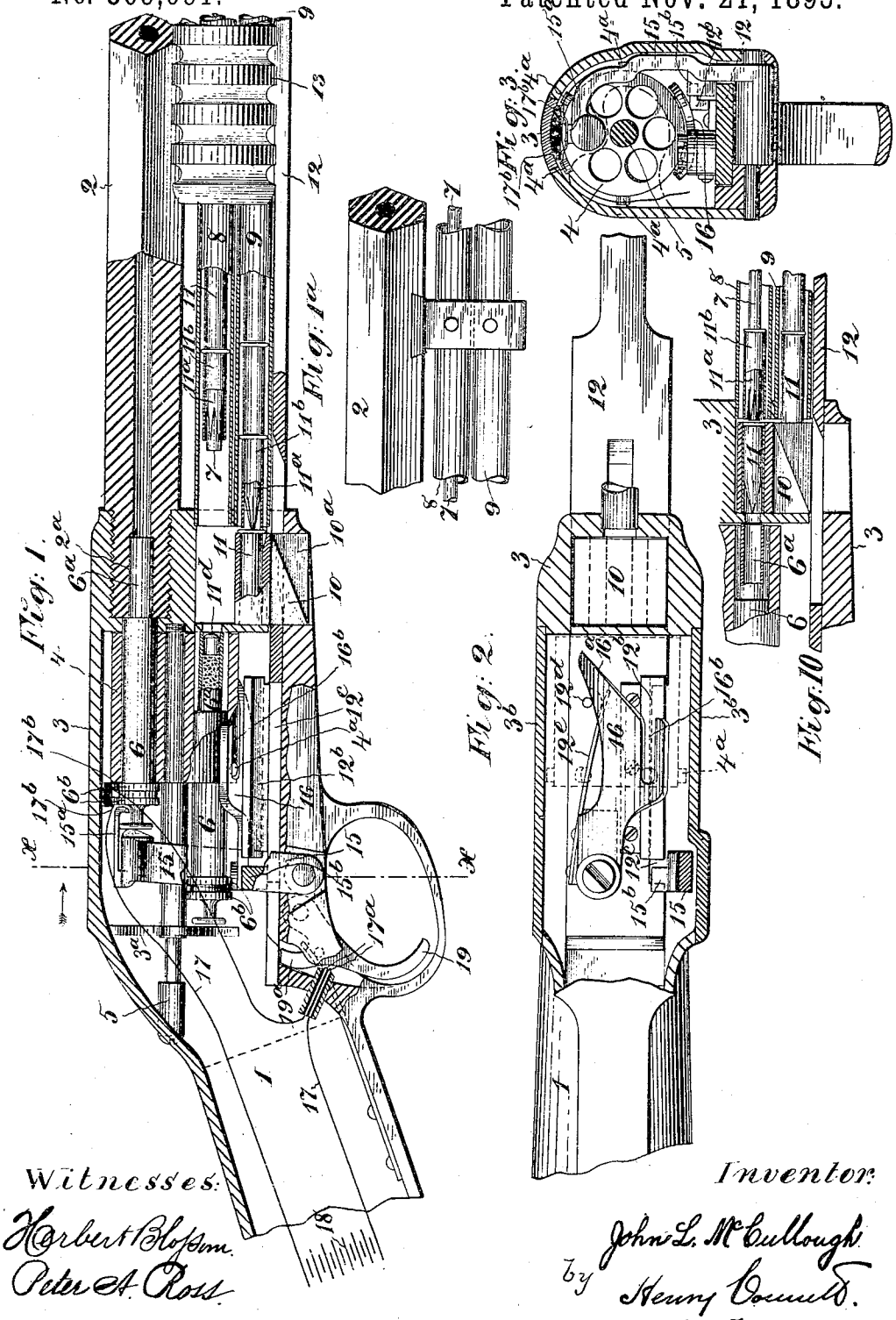
(No Model.) 2 Sheets—Sheet 1.

J. L. McCULLOUGH.

MAGAZINE GUN AND ELECTRICAL DEVICE THEREFOR.

No. 509,091. Patented Nov. 21, 1893.



Witnesses:
Herbert Hopson.
Peter A. Ross.

Inventor:
John L. McCullough.
by Henry Connett.
his Attorney

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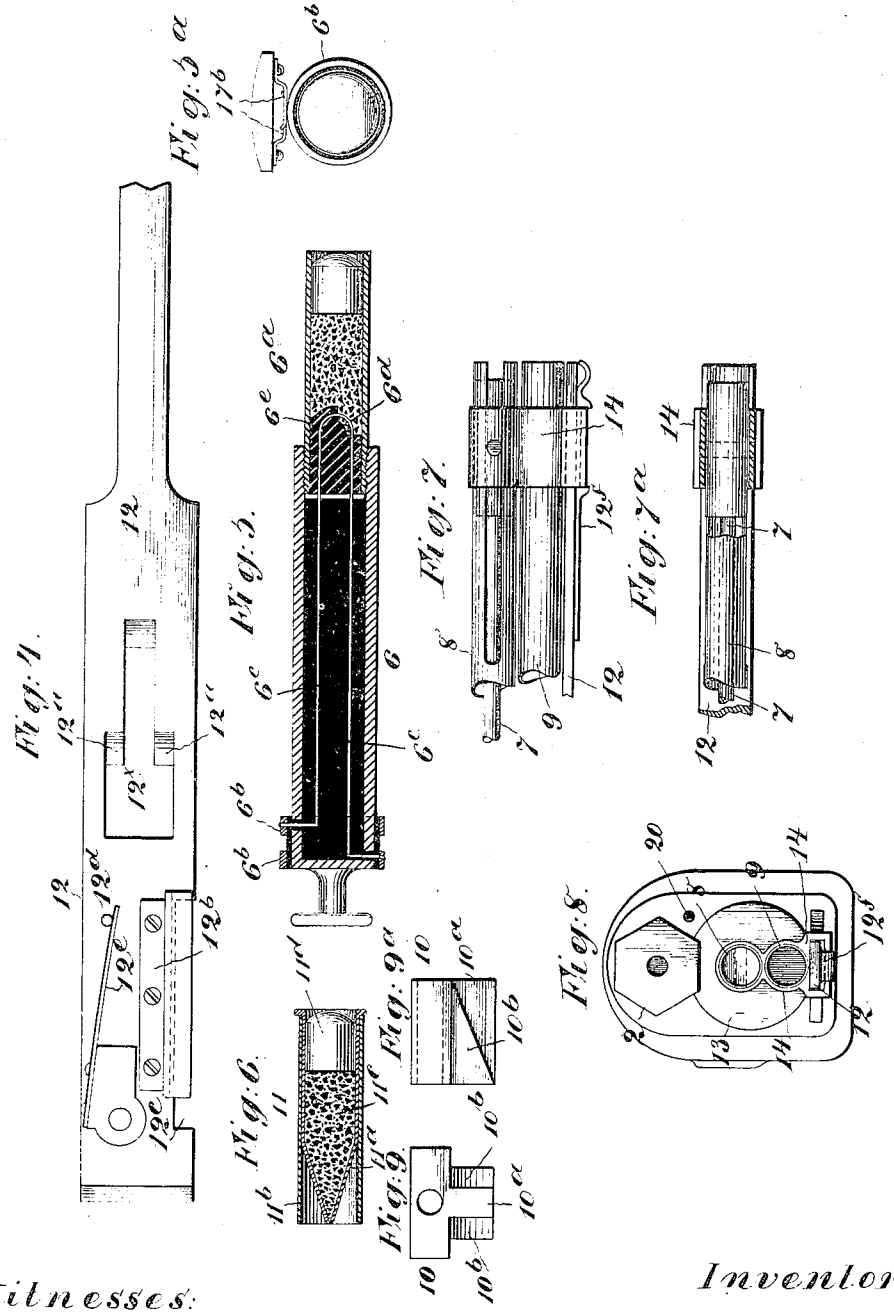

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UNITED STATES PATENT OFFICE.

JOHN L. McCULLOUGH, OF BROOKLYN, NEW YORK.

MAGAZINE-GUN AND ELECTRICAL DEVICES THEREFOR.

SPECIFICATION forming part of Letters Patent No. 509,091, dated November 21, 1893.

Application filed December 12, 1892. Serial No. 454,925. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. McCULLOUGH, a citizen of the United States, and a resident of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Magazine-Firearms, of which the following is a specification.

My invention relates to the class of magazine guns or small arms, and as herein shown it is embodied in a target gun adapted to be discharged by electricity.

The principal object of the invention is to produce a magazine gun capable of using shells adapted to be charged by the user with powder and ball as distinguished from the class of magazine guns in which cartridges containing fulminate must be used.

The invention will be fully described hereinafter and its novel features carefully defined in the claims.

In the accompanying drawings—Figure 1 is a sectional side elevation of the main portion of the gun, and Fig. 1ª is a side elevation of a part thereof showing the bracket for securing the magazine and rammer tube to the barrel. Fig. 2 is a sectional plan view, the plane of the section being taken below the cylinder. Fig. 3 is a transverse section taken substantially in the plane indicated by the line *x*, *x*, in Fig. 1. Fig. 4 is a plan view of the principal portion of the operating slide, detached. Fig. 5, is a longitudinal section of a permanent shell, enlarged, and Fig. 5ª is an elevation of the left hand end or butt of same, showing also the electrical contacts. Fig. 6, is a similar section of a loading shell. Figs. 7 and 7ª are, respectively, a side elevation and plan of the operating slide and rammer, showing how they are connected. Fig. 8, is a view of the muzzle end of the gun. Figs. 9 and 9ª are, respectively, an end and side view of the carrying block, detached. Fig. 10 is a sectional view similar to a part of Fig. 1, but showing the sliding block elevated and illustrating a slight variation in the construction which will be described.

The drawings represent, as stated, a target gun adapted to be discharged by electricity. 1 represents the stock, 2 the barrel, and 3 the metal frame and casing between and connecting the stock and barrel. Within this casing is rotatively mounted a cylinder, or chambered carrier, 4, similar to those found in many forms of revolvers. As herein shown this cylinder has six chambers (see Fig. 3), but the particular number of chambers is not essential to my invention. The cylinder is rotatively mounted on a pin, 5, which is screwed at its front end into the frame 3. In each chamber of the cylinder is fitted a permanent shell, 6, seen enlarged in Fig. 5. This shell is adapted to slide longitudinally in the cylinder chamber to a limited extent, for the purpose of inserting its load-chamber, 6ª, into the cartridge chamber, 2ª, of the barrel, when the shell is indexed, and withdrawing it therefrom so that the cylinder may be rotated. This permanent shell, 6, is in the form of a cylindrical tube, the portion 6ª, to contain the load or charge, being of less diameter than the main portion. This latter portion has about its outer end two insulated metallic contact rings, 6ᵇ, which connect, respectively, with insulated metal rods, 6ᶜ, within the shell. At their front ends the rods 6ᶜ contact with the extremities of a platinum loop, 6ᵈ, which is set in a plug 6ᵉ of some refractory insulating material. When the upper chamber of the cylinder 4 is indexed or aligned with the bore of the barrel of the gun, the lower chamber will register with a rammer or charging rod, 7, arranged in a tube, 8, situated below the barrel 2, as shown. Below the tube 8, is the magazine, 9, which is also a tube and which will be provided with a feeding spring in a manner similar to other magazines of this character. In a space or recess between the front end of the cylinder 4, and the ends of the tubes 8 and 9, is mounted a sliding, carrying block, 10, having in it a chamber or bore which stands, normally, aligned with the magazine tube, but which is moved up at each loading operation into line with the rammer 7, on the one side, and the lower chamber of cylinder 4, on the other side.

For brevity and convenience in describing the construction and operation of my gun, I have called the point where the chamber in the carrier 4 stands when aligned with the bore in the barrel, the "index point," this being the term employed technically in the trade.

The chamber in the block receives the foremost loaded shell from the magazine, and this chamber will be proportioned to neatly fit the said shell, 11, which is seen enlarged in Fig. 6. As this loading shell is well adapted to my gun I will describe it with especial reference to this figure, which shows it charged or loaded. It is composed of two tubes, preferably of thin metal; the inner tube, 11^a, is provided with a flange at its outer end, and at its inner end it is slitted and the spring tongues thus formed are bent together so as to close the tube at that end and give to it a conical form. Inclosing the tube 11^a, is another, straight tube, 11^b. In charging the shell 11, the user inserts the powder 11^c at the open end of the shell and then places the ball, 11^d, on it, as seen in the figure. These loaded shells are placed in the magazine in substantially the same manner that cartridges are placed therein. Mounted in guides below the magazine is an operating slide, 12, provided with a grip, 13, for moving it to and fro in loading. This slide is coupled at its outer end to the rammer 7, by means of a yoke, 14. Normally a rib, 10^a, on the block 10, rests in a slot $12^\times$, in the slide 12, (see Fig. 4) and when the latter is moved back in loading, shoulders, 12^a, on the slide engage inclines, 10^b, on the block and move the latter upward to its elevated position opposite to the rammer. Any device whereby the movement of the slide 12 will be converted into lateral movement of the block, may be employed. The first movement of the slide backward in charging moves up the block 10, bringing the loaded shell it carries into line with the rammer and with the chamber in the cylinder. The rammer partakes of this movement, but by reason of its being short, it does not reach the block during the first part of the movement; as the slide continues to move back, however, the rammer enters the front end of the shell 11 in the block and forces the charge therein through and out of the same and into the load-chamber, 6^a, of the permanent shell 6 in the lower chamber of the cylinder 4. The first part of the movement of the operating slide also serves to withdraw the permanent shell at the index point, which was last fired. This is effected through the medium of a lever, 15, pivoted in the frame 3 below the level of the slide 12, and having at its upper end a hook, 15^a, which engages a circumferential groove in the butt of the permanent shell 6 which happens to be at the index point. This lever has projecting from its side a stud, 15^b, arranged to stand, normally, just above the upper face of the slide with its flat lower face substantially in contact therewith so that, when the gun is fired, the head of the lever, which stands behind and in contact with the butt of the permanent shell at the index point, will act as an abutment to prevent the recoil of the shell as hereinafter explained. On the upper face of the slide, in front of the stud 15^b, is a flanged block, 12^b, which, when the slide has been moved back far enough to bring an aperture or recess, 12^c, therein under the stud 15^b, strikes the said stud and swings the lever back, the hook on its head drawing back with it the permanent shell at the index point. As the lever moves about a center, the stud 15^b describes a curve and descends into the recess 12^c in the slide, and eventually the flange on the block 12^b passes over the stud at the moment the lever reaches the end of its movement. At this moment also the rammer comes into action and drives the charge from the loading shell into the load-chamber of the permanent shell. The block 12^b is of sufficient length to remain over the stud 15^b during this latter part of the movement and thus prevent any disturbance of the lever. The operator now moves the slide forward again. The first part of the movement withdraws the rammer from the block 10, carrying with it the empty shell 11, which it withdraws from the block 10, by reason of the biting or clamping thereon of the spring fingers on the shell, which expand to allow the rammer and charge to pass through and then close on the rammer when the latter withdraws from the block. The flange on the outer end of the shell prevents it from being driven through the block 10 when the rammer is forcing out the charge. While the rammer is being withdrawn from the chamber in the block, the cylinder 4, is rotated to bring another chamber to the index point. This is effected by mechanism which I will now describe. Pivotally mounted on the upper face of the operating slide is a cam, 16, of concave form, which takes under the cylinder 4 and stands, normally, between two of the six indexing pins, 4^a, of the same. This cam is held up to a stop-pin, 12^d, on the slide, by a light spring, 12^e. When the slide 12 is drawn back, it carries with it the cam, an incline at the back of the latter causing the cam to be slightly displaced laterally by the indexing pin at that side so that, when the point of the cam passes said pin the spring will cause it to return to its first position. Now when the operating slide is moved forward, the point of the cam takes on the other side of the said indexing pin and an inclined face, 16^a, on the cam, acting on the pin, rotates the cylinder to the proper extent. The further forward movement of the slide causes the index pin to enter a slot, 16^b, in the cam, thus insuring the proper indexing of the cylinder and holding it steady while the lever 15 drives in the permanent shell. It will be noted that when the lever 15 draws out the permanent shell, its hook stands in such a position as not to interfere in any way with the lateral movement of the shell when the cylinder 4 rotates, and therefore, when the next succeeding shell is brought to the index point it occupies the same position with respect to the hook on the

lever that the shell preceding it occupied. When the slide 12 has moved forward far enough, the shoulder formed by the rear end of the aperture or recess 12^c in the slide strikes the stud 15^b on the lever 15, and swings the latter forward, its head, 15^c, taking behind the butt of the permanent shell and pushing the latter into the cylinder and barrel. Thus it will be seen that the overhanging flange on the block 12^b pushes the lever 15 back and withdraws the permanent shell, and the shoulder on the slide 12 pushes the lever forward and drives the shell in. When the shoulder on the slide 12 has pushed the lever 15 forward to the full extent, as seen in Fig. 1, the lever will stand upright and the stud 15^b, which is flat on its lower face, will be raised just above the level of the upper face of the slide. The further forward movement of the slide will carry the latter under said stud with its upper face in substantial contact therewith, and the explosion of the charge cannot then drive the lever back owing to the fact that the slide 12 will prevent it from swinging on its pivot. Thus the lever resists the recoil. When the rammer 7 becomes encumbered with empty shells 11 it may be uncoupled from the slide 12 and drawn out; the shells can then be slipped off and again charged. This uncoupling may be effected in any convenient manner; as herein shown (see Figs. 7 and 8) the yoke 14 is made to slip over the slide 12 and engage a recess between shoulders on a keeper spring, 12^f, on the slide. By pressing back this spring into an open slot or recess in the slide the yoke may be slipped off from the latter.

I will now describe the means I employ for effecting the ignition of the charge by electricity.

An electric circuit is formed by suitable conductors, as, 17, including a generator, 18, which may be, and will by preference be, a galvanic battery or cell within a chamber in the stock of the gun. The conductors 17 lead to a point within the casing where their two terminals 17^b will be in electrical contact with the respective metal bands, 6^b, on that permanent shell, 6, which is at the index point. These terminals should be spring contacts. This position of the parts puts the platinum loop 6^d into the electric circuit, which has a break at 17^a, adapted to be closed by the contact of the trigger, 19, with the circuit terminals at the break, when the trigger is pulled. When the circuit is thus closed the platinum loop, 6^d is heated to redness or incandescence in the presence of the powder and the charge instantly ignited. The plug 6^e is made removable so that it and the platinum loop may be renewed when the latter becomes impaired.

In order that the user may not be able to effect a contact of the trigger with the circuit terminals at 17^a except when the slide 12 has been moved forward to its fullest extent, the trigger has a projection 19^a which takes closely under the slide and prevents any backward movement of the trigger until the slide is moved forward from over it.

I have simply indicated the battery or generator, 18, diagrammatically in Fig. 1, as it is not new to place such generators in the stock of a gun and not new to explode the charge by such means. Moreover, I have not shown the spring in the magazine, as this form of magazine is old and well known to those skilled in the art.

In Fig. 1, I have shown one of the loading shells, 11, with the outer tube, 11^b, partly broken away so as to disclose the construction of the spring fingers on the inner tube the more clearly. In this figure, also, the lever 15 is partly broken away to show the mechanism behind it. The permanent shells 6 are omitted from Fig. 3 so that the chambers in the cylinder may be the more clearly seen. The pin 5, on which the cylinder 4 rotates, is extended back and has a bearing in a partition 3^a in the frame 3, and its nicked outer end appears at an aperture in the frame where it may be conveniently reached by a screw-driver for removal. As the space for the movement of the head of the lever 15 is limited, the pin 5 is cut away or reduced to provide room, as clearly seen in Fig. 1. The frame 3 will be inclosed at the sides by plates, 3^b, in the usual way.

I contemplate providing an aperture in the front of the casing 3, leading to the chamber in the cylinder 4 from which the load was last discharged in order to ventilate said chamber. This is seen at 20, in Fig. 8.

By indexing, as herein employed with respect to the chambers in the rotating cylinder, is meant the alignment of one of said chambers with the bore in the barrel of the gun.

As herein shown the binding of the cylinder on the pin 5 is relied on to prevent back rotation of the cylinder, but of course a stop-pawl such as is in common use may be employed for the purpose. Such a pawl or backstop is too common to require illustration.

By the term cylinder as applied to the carrier for the permanent shells, I do not mean, necessarily, a piece having a cylindrical form, but a chambered carrier which brings the shells in succession to the index point.

It will be seen that one of the characteristics of my gun is that it does not employ fixed ammunition, and another is that it employs a chambered cylinder, the chambers in which do not form parts of the barrel nor serve as cartridge chambers. In the fire arms hitherto constructed, so far as I am aware, wherein a chambered cylinder is employed, the shell containing the charge is in the chamber in the cylinder when the charge is exploded. The disadvantage of this construction is that the gases from the explosion escape to some extent at the joint between the rear end of the barrel and the front end of the cylinder. My construction enables me to employ a

chambered cylinder without this disadvantage from its employment.

In the construction of the loading shell 11, hereinbefore described, it has a flange at its outer end to prevent it from being driven through or wholly into the chamber in block 10, but this is not essential. In Fig. 10 I have shown how shells without such projecting flanges may be employed. This view shows the block 10 elevated. In the partition of the frame between the block 10 and the rotary carrier 4, is an aperture large enough to permit of the passage of the charge in the shell 11, but not large enough to permit of the passage of the outer tube of this shell. In Fig. 1 this aperture in the partition is represented as larger than in Fig. 10.

Having thus described my invention, I claim—

1. In a magazine gun, the combination with the barrel, a chambered carrier provided with sliding, permanent shells, means for pushing in and withdrawing the permanent shell at the index point, a magazine, means for carrying a shell containing a charge from the magazine into line with one of the chambers of the carrier which is not at the index point, and a rammer aligned with said chamber, for forcing the charge from the loaded shell into the permanent shell in said chamber.

2. In a magazine gun, the combination with the barrel, the frame, the chambered carrier, and sliding permanent shells in the respective chambers in said carrier, of a reciprocating operating slide, means actuated by said slide for intermittently shifting said carrier and for shifting the permanent shell in the cylinder at the index point, a magazine to contain loaded shells, means operated by said slide, for carrying a loaded shell from the plane of the magazine to a position aligned with one of the chambers of the carrier, and a rammer aligned with said chamber and actuated by said operating slide, whereby the charge is forced from the loaded shell into the permanent shell in the chamber.

3. In a magazine gun, the combination with the barrel, the frame, and the shifting, chambered carrier in the frame, of the permanent shells in the respective chambers of the carrier, each provided with a chamber to receive the charge, and a partial electric, charge-igniting circuit having exteriorly arranged terminals, a partial broken electric circuit including a generator, mounted on the gun, means for shifting the permanent shell at the index point, whereby the partial circuits are closed and form one, means for charging the permanent shells, and a trigger arranged to close the circuit at the break and thus ignite the charge, as set forth.

4. The combination with the barrel, the casing, and the chambered carrier mounted therein and having in each of its chambers a sliding, permanent shell 6, of the lever 15, provided with a hook 15^a, to engage said shells and a stud 15^b, and the operating slide, provided with means for actuating and holding said lever, substantially as set forth.

5. The combination with the barrel, the casing, and the chambered cylinder, rotatively mounted therein and provided with indexing pins, of the operating slide, the cam for rotating the cylinder pivotally mounted on the slide and having an inclined face 16^a, the cam-spring and the stop-pin, all arranged to operate, substantially as set forth.

6. The combination with the barrel, the frame, the chambered cylinder mounted rotatively therein, and permanent shells in the chambers of the cylinder, of the operating slide, the magazine, the rammer, coupled to the slide and aligned with a chamber in the cylinder, and the chambered sliding block, 10, normally aligned with the magazine, and provided with inclines which engage shoulders on the operating slide, whereby the said block is moved into alignment with the rammer by the movement of the slide.

7. In a magazine gun adapted to be discharged by electricity, the combination with a chambered carrier, of permanent shells, 6, mounted in the respective chambers of said carrier, each of said shells having a load-chamber 6^a, two metal rings or contact bands, 6^b, an insulated loop 6^c, open to the chamber 6^a, and metallic conductors connecting the respective rings 6^b with the terminals of said loop, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN L. McCULLOUGH.

Witnesses:
HERBERT BLOSSOM,
PETER A. ROSS.