

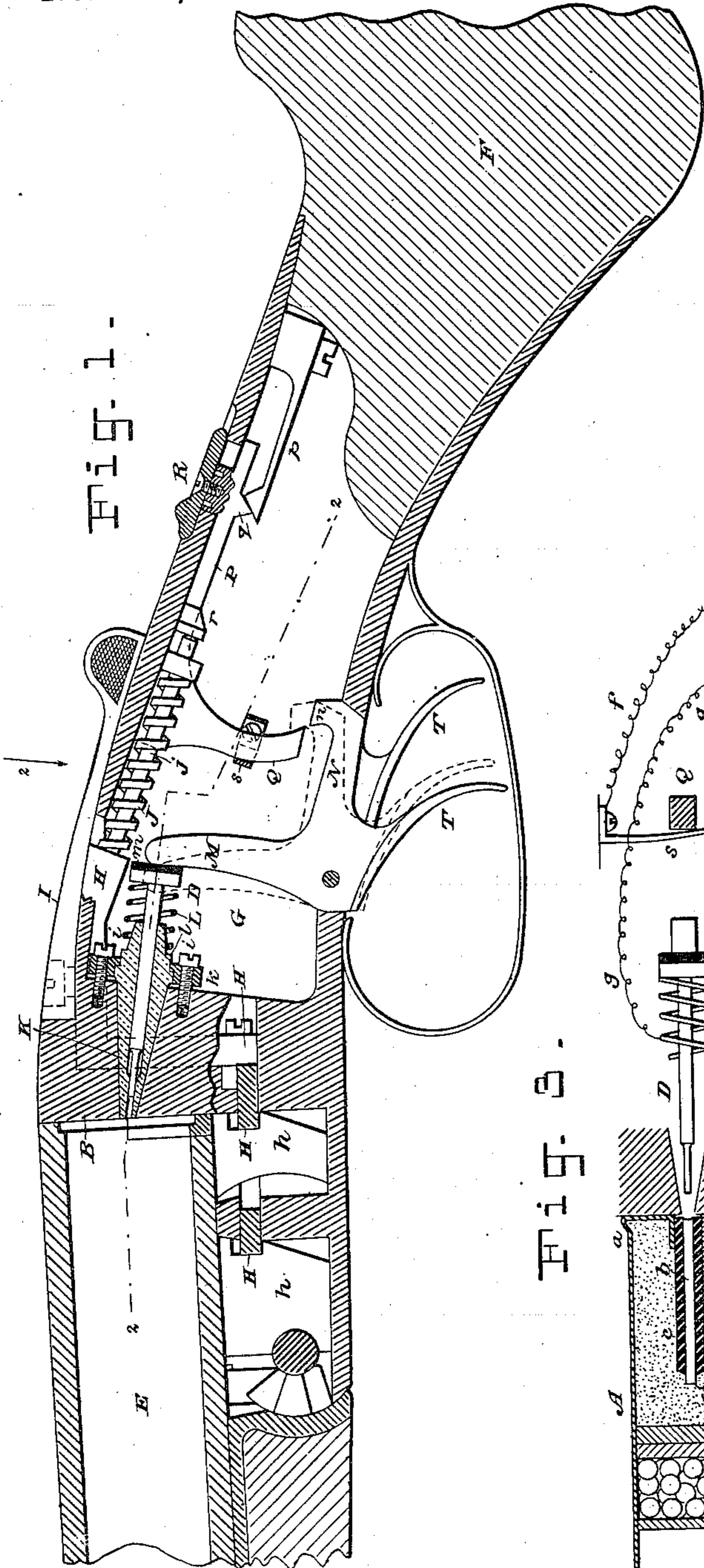
(No Model.)

S. RUSSELL.
ELECTRIC GUN.

No. 307,070.

Patented Oct. 21, 1884.

Fig. 1-



WITNESSES:

E. R. Bolton
Geo. H. Fraser

Fig. 2-

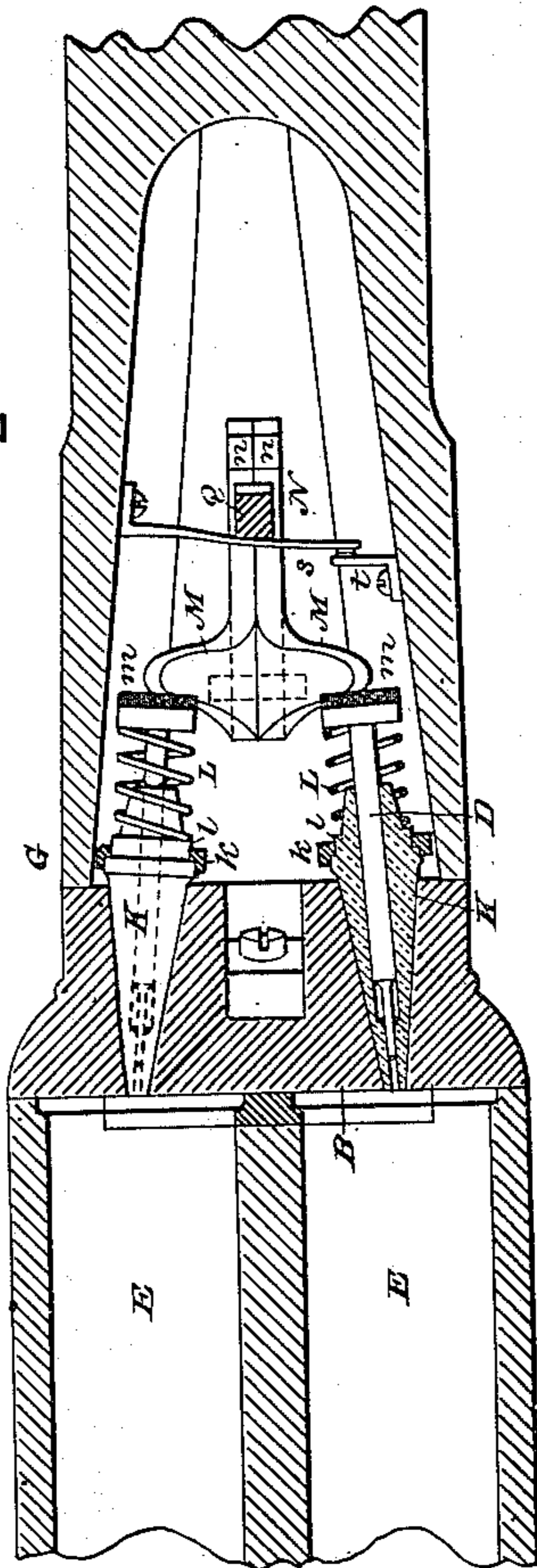
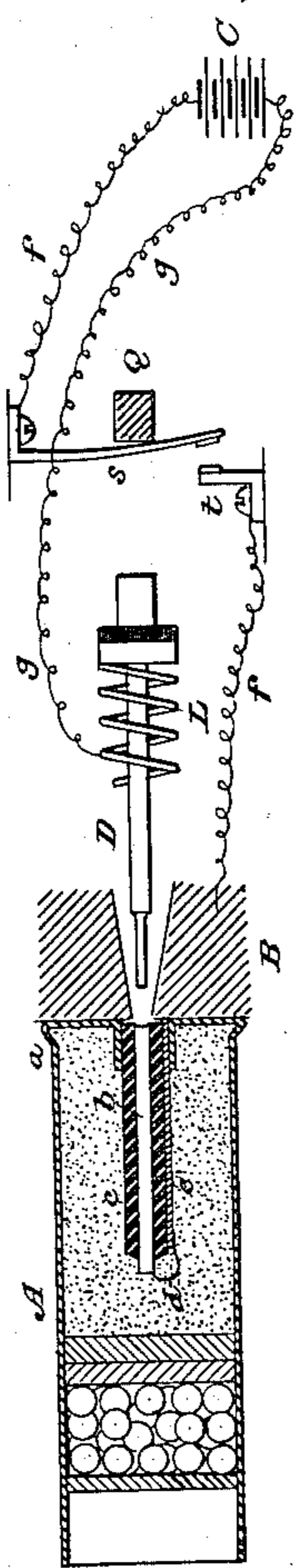


Fig. 3-



INVENTOR:

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UNITED STATES PATENT OFFICE.

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ELECTRIC GUN.

SPECIFICATION forming part of Letters Patent No. 307,070, dated October 21, 1884.

Application filed February 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL RUSSELL, a citizen of the United States, residing in the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Guns, of which the following is a specification.

My invention has reference to those guns or fire-arms wherein the charge is fired by electricity. An electric cartridge is employed, the charge of powder being in contact with an incandescing conductor or high-resistance wire in the cartridge, the terminals of which conductor are connected, respectively, with the metallic base of the cartridge, and with a central metallic contact insulated from said base.

The object of my invention is to provide a gun for firing such a cartridge which shall be safer, more convenient, and more positive and effective in its action than electric guns as heretofore made.

Figure 1 of the accompanying drawings is a vertical longitudinal section of the breech of a double-barreled shotgun constructed according to my invention, the plane of the section passing through the axis of one of the barrels and through the center of the stock. Fig. 2 is a longitudinal section cut along the line 2 2 in Fig. 1, and looking in the direction of the arrow 2 therein. Fig. 3 is a section of the preferred form of electric cartridge to be used with my gun appended to a diagram showing the electric circuit.

The cartridge A (shown in Fig. 3) is the same as that described and claimed in another application for patent executed by me this day, to be filed simultaneously herewith. Its distinguishing feature is that the metallic base of the shell forms one terminal of the incandescing conductor, and the other terminal thereof is centrally arranged and insulated from the base.

Let *a* designate the metallic shell, and *b* the central conductor, which is a metal pin or rod, and is inclosed in a tubular insulating sheath, *c*. At its front end is connected the incandescing conductor *d*, which consists of a short piece of fine platinum wire, and the other end of this conductor is joined to a conductor, *e*, which consists of a strip of copper, which

passes along the outside of the sheath *c* and joins the metallic base *a*. The base of the cartridge comes against the breech-block B, which is connected through a wire, *f*, with one pole of the battery C, and the other pole of this battery is connected by a wire, *g*, to a firing pin or bolt, D, of metal. The battery is usually placed in a mortise in the butt-end of the stock, the wires *f* *g* passing through a hole or holes therein to the breech. When it is desired to fire the cartridge, this firing-pin is pressed forward until it touches and makes electrical contact with the pin *b* in the cartridge, whereupon the circuit is closed, and the current, in passing through the platinum conductor, heats it to incandescence and ignites the powder.

Prior to my invention the only electric guns known or suggested for firing by means of an incandescing wire, so far as I am aware, have been of two classes. In one the cartridge contains a platina wire, one terminal of which connects through the barrel and breech with one pole of the battery, and the other pole of the battery is connected with a firing-pin or sharp needle, which, when pushed forward by pulling the trigger, penetrates the cartridge or charge of powder until it touches the other terminal of said platina wire, whereupon the current is established and the gun is fired. In guns of the other class the cartridge has had two exterior contact-terminals, both of which have made connection with corresponding contacts on the gun upon closing the breech, and the latter have formed the terminals of an open circuit, to be closed by a push-button or key in order to fire the gun.

My invention aims to provide an electric gun which, while simple in its parts, shall be certain in its action and entirely free from danger. To this end I employ the firing-pin to make electrical contact with the center of the cartridge, instead of penetrating the latter, and I provide automatic means for breaking the circuit leading to the battery, so that neither pole thereof shall be electrically connected with either terminal of the cartridge, and for locking the trigger, so that it is impossible to discharge the gun after it has been loaded until it has been prepared for firing by a distinct preparatory movement.

I will now more particularly describe my improved gun adapted as a shotgun, as shown in Figs. 1 and 2, first stating, however, that my gun is entirely hammerless, resembling externally the so-called "hammerless guns" or internal-hammer guns, and being constructed internally in some respects similarly thereto.

Let E E designate the barrels, F the stock, and G the breech. The gun is a breech-loader, and is provided with the usual fastening for holding the barrels to the breech when turned up, consisting of hooks *h h* on the barrels, engaging a sliding bolt or frame, H, which is operated to release the hooks by the usual unlocking-lever, I, on top of the breech. The bolt H is pressed forward by a spring, J, on a rod, *j*, as usual. The breech-block B is solid with the breech, and is formed with two conical holes, in which are fitted tubular conical plugs K K, of insulating material, which form bearings for the firing-pins D D. The point of the cone is turned toward the front, so that but a small orifice is made in the face of the breech-block. Each plug K is held in place by a ring-shaped frame, *k*, of metal, which takes against a shoulder on the plug, and is forced toward the front by two screws, *i i*, Fig. 1. Back of this ring *k* the plug K is reduced in diameter, and over it is placed a helical spring, L, which is re-enforced against a shoulder, *l*, on the plug, and presses backwardly against the head of the firing-pin D. The rear surface of this head is covered with an insulation, *m*.

T T are the triggers, or, more correctly, firing-levers. Externally these are the same as on any ordinary gun, but internally each is formed with two arms, M and N. The arms M M extend up to the respective firing-pins D D, where their ends rest against the insulating-caps *m m*. When either trigger is pulled, the arm M pushes its firing-pin forward against the resistance of the spring L until the point of the pin touches the center of the cartridge and fires it. The springs L L serve as trigger-springs in addition to their function in retracting the firing-pins, and should have sufficient stiffness to give the requisite "pull" to the trigger. The arms N N of the two triggers extend rearwardly, and their ends are turned up, as shown at *n* in Fig. 1. Underneath the top plate of the breech is arranged a slide, P, which has a limited movement forward and backward. On this slide is an arm, Q, which projects downwardly to the ends *n* of the arms N N. When the slide P is moved forward, as shown, the end of Q does not interfere with the ends *n n*, and the triggers may be pulled as denoted by dotted lines in Fig. 1; but when the slide P is moved to the rear, the end of the arm Q comes directly over the ends *n n* of both arms N N, and the triggers are locked and cannot be pulled. This is the "safety" lock of the gun. It is operated by means of a roughened button, R, on the top of the stock, and when moved either forward or back it is held there

by the spring *p* acting against a V-shaped projection, *q*, on the slide. When the unlocking-lever I is turned to permit the barrels to be broken down, the backward movement of the bolt H pushes back the slide P, and so sets the gun to "safety." This is done by the pin *j*, which moves with the bolt H, striking and pushing back a shoulder, *r*, on the slide P. After being loaded the gun cannot be fired until the button R has been pushed forward. The manipulation of the gun is thus the same as of the well-known hammerless gun before referred to.

In addition to the mechanical safety-lock to keep the trigger from being pulled, I provide as an additional safeguard that whenever the slide P is drawn back to "safety" the electric circuit shall be broken at some intermediate point, in addition to the break between the firing-pin and the cartridge. In this manner I entirely isolate the battery from both terminals of the cartridge, except when the gun is ready to be fired. On the inside of the stock is fixed a contact-stop, *t*, Figs. 2 and 3, and a spring, *s*, is attached to the opposite side, passes in front of the arm Q, and terminates with a contact-pin facing the stop *t*, as shown in Fig. 3. When the slide P is moved back, this spring does not touch the stop *t*, and the circuit is broken between them, as shown in Fig. 3; but when the slide is pushed forward the arm Q presses the spring against the stop, as shown in Fig. 2. The spring and stop form part of the wire *f*, as shown, (in preference to the wire *g*,) in order to break the connection between the base of the cartridge and battery.

When my gun is first loaded and the barrels are turned up, it is impossible to discharge it, because the triggers cannot be pulled and the cartridge is not in electrical connection with either pole of the battery. When the slide is pushed forward, the triggers are released, and one terminal of the cartridge is connected with one pole of the battery; and when the trigger is pulled connection is made between the other terminal of the cartridge and the other pole of the battery, the circuit is established, and the cartridge is exploded.

My invention is equally applicable to single-barreled guns, and may, with slight modification, be applied to rifles and magazine-guns.

I claim as my invention—

1. In a gun for firing electric cartridges, the combination of a battery, the breech-block in electrical connection with one pole thereof, a normal break in such connection, a movable part upon the exterior of the gun adapted to close said break, a firing-pin insulated from said breech and in electrical connection with the other pole of the battery, and the trigger adapted, when pulled, to protrude the firing-pin into electrical connection with the cartridge, whereby when the gun is set to "safety" both poles of the battery are disconnected from the cartridge, substantially as set forth.

2. In a breech-loading gun for firing electric

cartridges, the combination of a battery, a firing-pin in electrical connection with one pole thereof, the trigger, adapted, when pulled, to protrude the firing-pin until it makes electrical contact with the cartridge, the breech-block insulated from said pin and in electrical connection with the other pole of the battery, a circuit-break in said latter connection, a slide adapted to open or close said break, the unlocking-lever for opening the breech, and mechanical connection between said lever and said slide, substantially as described, whereby the said slide must be moved and the said break opened before the barrels can be broken down, so that when the gun is first loaded neither terminal of the cartridge is in electrical connection with the battery, as set forth.

3. In a gun for firing electric cartridges, the combination, substantially as set forth, with the breech-block adapted to make contact with one electric terminal on the cartridge, of a firing-pin insulated from said breech-block, a battery with its opposite poles connected, respectively, to said breech-block and firing-pin, a trigger adapted, when pulled, to protrude said firing-pin and make electrical contact between its end and the other electric terminal of the cartridge, in order to explode the latter, a retracting-spring adapted to press back said firing-pin and trigger, and a mechanical safety-lock, substantially as described, adapted to prevent the protrusion of said firing-pin until it is withdrawn.

4. In a gun for firing electric cartridges, the combination of breech-block B, firing-pin D, battery C, with its opposite poles connected, respectively, to said breech-block and firing-pin, trigger T, having arms M N, safety-slide P, having arm Q, adapted to lock the trigger, unlocking-lever I, bolt H, adapted, when retracted, to shift slide P to the locked position, and circuit-breaking spring s, arranged to be operated by said slide, substantially as set forth.

5. In an electric gun, the combination of the breech-block, adapted to make electrical contact with the base of the cartridge, a conical plug, K, of insulating material, fitted in a conical hole through said breech, with its smaller end toward the barrel of the gun, a fastening device taking against a shoulder on the larger end of said plug and secured to the breech, a firing-pin, D, working in a hole through said plug, and a spring for retracting said pin, interposed between a head or shoulder thereon and the rear of said plug, substantially as set forth.

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

SAMUEL RUSSELL.

Witnesses:

ARTHUR C. FRASER,
ARTHUR S. BROWN.