

No. 638,045.

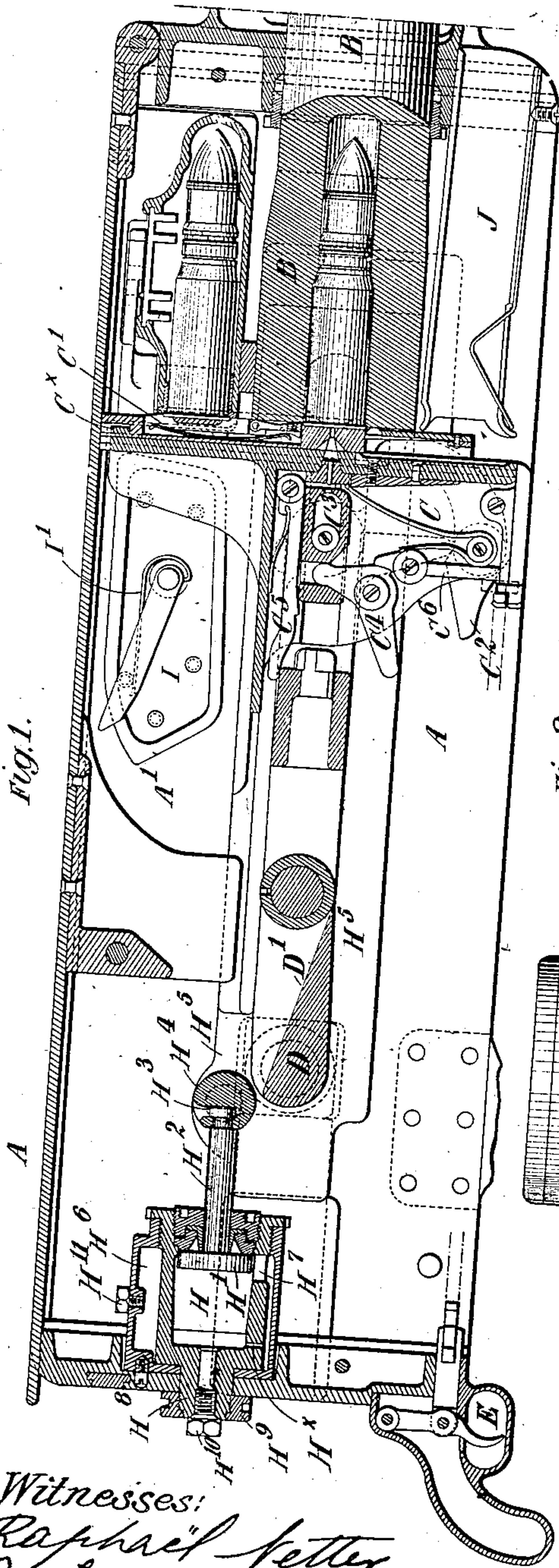
Patented Nov. 28, 1899.

A. T. DAWSON & L. SILVERMAN.  
RECOIL MECHANISM FOR AUTOMATIC MACHINE GUNS.

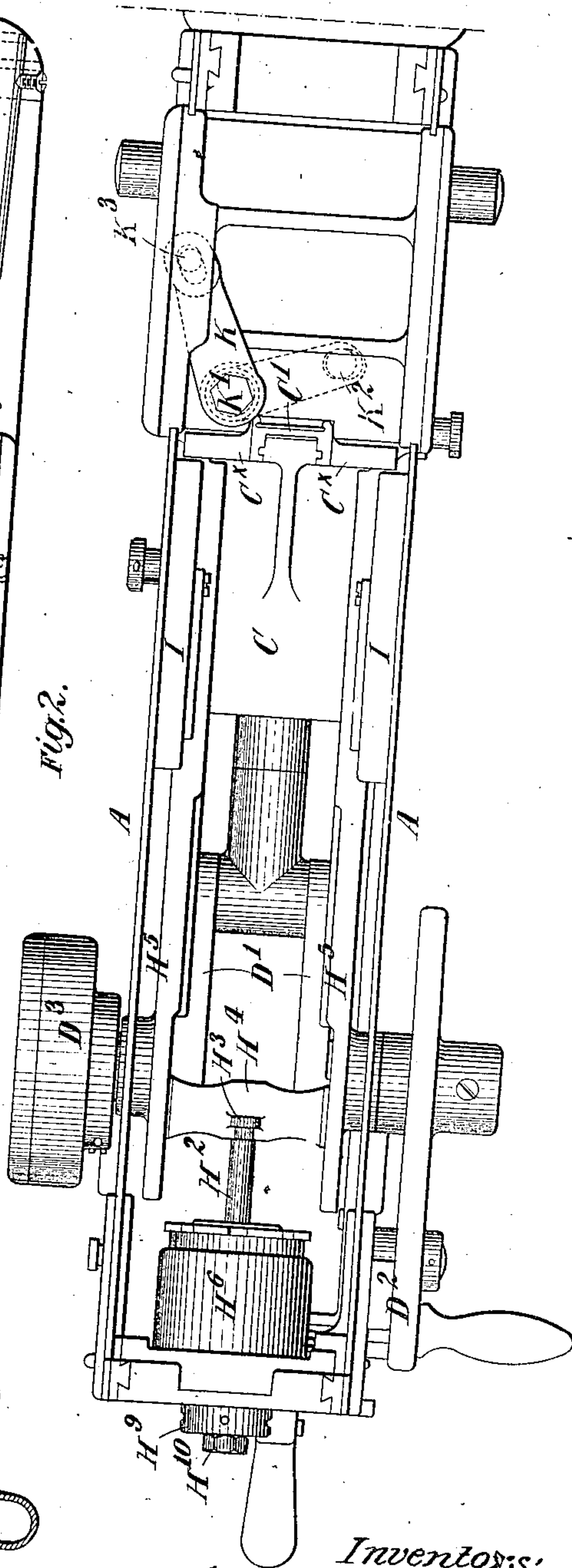
(No Model.)

(Application filed Apr. 20, 1899.)

2 Sheets—Sheet 1.



Witnesses:  
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M. Larson Dyer.



Inventors:  
Arthur T. Dawson &  
Louis Silverman  
by Ken. Page & Cooper Attys.

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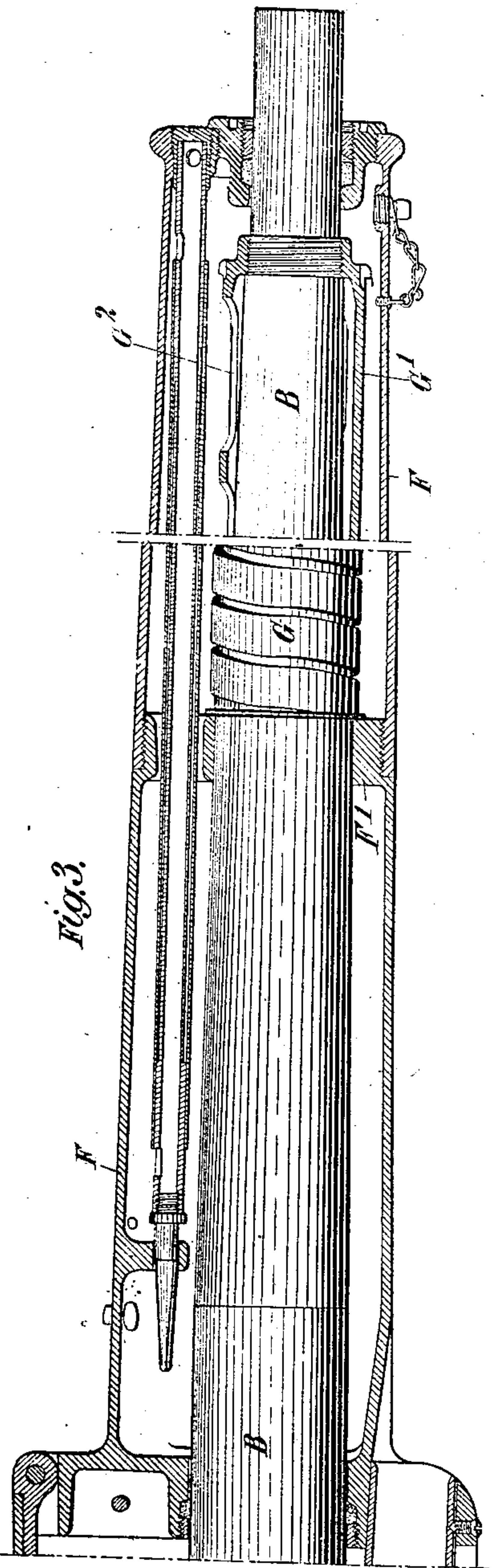
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# UNITED STATES PATENT OFFICE.

ARTHUR TREVOR DAWSON AND LOUIS SILVERMAN, OF LONDON, ENGLAND, ASSIGNORS TO THE VICKERS, SONS & MAXIM, LIMITED, OF SAME PLACE.

## RECOIL MECHANISM FOR AUTOMATIC MACHINE-GUNS.

SPECIFICATION forming part of Letters Patent No. 638,045, dated November 28, 1899.

Application filed April 20, 1899. Serial No. 713,695. (No model.)

*To all whom it may concern:*

Be it known that we, ARTHUR TREVOR DAWSON, late lieutenant of the Royal Navy, and LOUIS SILVERMAN, engineer, subjects of the Queen of Great Britain, residing at 32 Victoria street, London, England, have invented an Improvement in Recoil Mechanism for Automatic Machine-Guns, of which the following is a specification.

10 This invention is an improvement in the recoil mechanism for automatic machine-guns, its object being to provide a means whereby guns of large caliber and adapted to fire heavier charges than heretofore may be  
15 operated on the same plan as the ordinary rapid-fire machine-guns. These guns have usually been constructed for firing ammunition not much, if any, heavier than that used for small-arms; but according to our present  
20 invention we have sought to adapt the automatic mechanism especially for guns, say, of a caliber of about one and one-half inches or more. In order to accomplish this, we combine with the barrel, which slides endwise  
25 on recoiling in a frame or cradle, a spiral spring placed around the barrel within the water-jacket and with the breech mechanism a hydraulic buffer, which is so placed within the gun-casing at the rear of the crank and  
30 is so arranged that it can be readily replenished with liquid without removing it from the gun. It is capable, however, of being quickly removed for inspection or repair and of being as quickly replaced.

35 In order that our said invention may be clearly understood and readily carried into effect, we will proceed to describe the same more fully with reference to the accompanying drawings, in which—

40 Figure 1 is a vertical longitudinal section of the rear portion of the gun. Fig. 2 is a plan of the same with the top cover removed. Fig. 3 is a vertical longitudinal section of the fore portion of the gun.

45 Like letters of reference indicate similar parts in all the figures.

A is the casing inclosing the breech mechanism. B is the barrel. C is the breech block or lock; C', the cartridge-carrier; C<sup>2</sup>,

the lifting-levers therefor; C<sup>3</sup>, the firing-pin; 50 C<sup>4</sup>, the cocking-lever; C<sup>5</sup>, the safety-sear, and C<sup>6</sup> the firing-sear. D is the crank-shaft; D', the crank; D<sup>2</sup>, the crank-handle, and D<sup>3</sup> the casing inclosing the spring which acts to return the crank to its firing position. E is 55 the trigger, and F is the water-jacket. All of these parts are of ordinary construction, except that they are made heavier and stronger to bear the increased stresses to which they are subjected. 60

G is the recoil-spring, which is placed around the barrel in the water-jacket, one end thereof resting against a partition F' in the water-jacket and the other end resting against a sleeve G', fixed to the barrel. By employing 65 this sleeve we are able to avoid the use of a spring of undue length. G<sup>2</sup> are perforations in the said sleeve for permitting the cooling liquid in the water-jacket to come into direct contact with the barrel. 70

H is the hydraulic buffer, comprising a cylinder of suitable metal arranged at the rear end of the casing of the gun. Within the said cylinder is a piston H', from which extends, through the cover of the cylinder, a rod H<sup>2</sup>, 75 having at its outer end a head or shoulder H<sup>3</sup> to engage with a recess formed in a cross-bar H<sup>4</sup>, connecting together the opposite sides of the inner sliding frame H<sup>5</sup>. As the said sliding frame moves backward in the recoil the 80 piston moves toward the rear end of the cylinder, which is preferably made tapering toward its rear end. The piston is made smaller than the bore at the forward end of the cylinder, so that as it commences to move back- 85 ward the liquid can pass freely from the rear to the front thereof; but as the piston continues its backward movement the passage between the cylinder and the periphery of the piston gradually diminishes and at the end of 90 the stroke will be completely or nearly closed. The recoil movement of the breech mechanism will thereby be gradually checked. The aforesaid cylinder is surrounded by a casing H<sup>6</sup>, which communicates with the cylinder 95 through a port H<sup>7</sup> at the forward end of the bore of the said cylinder, such casing affording space for containing the necessary quantity



of liquid for the hydraulic buffer. There is likewise a hole  $H^x$  in the wall of the cylinder, near the rear end thereof, for the escape of liquid from behind the piston when the latter is completing its rearward stroke. In order that the said cylinder may be readily removable, we form on its rear end a shank or cylindrical extension  $H^8$ , which extends through the rear plate of the said gun-framing and has on its outer extremity a screw-thread for receiving a nut  $H^9$ , whereby it is secured in place. The said shank or cylindrical extension is hollow and is closed by a suitable stopper or screw-plug  $H^{10}$ , which can be removed at any time without detaching the cylinder and permit access to be had to the interior of the cylinder from the exterior of the gun for any purpose—as, for instance, to replenish it with liquid. There is also provided another screw-plug  $H^{11}$  in the casing  $H^6$  for enabling the latter to be charged with liquid from the interior of the gun-casing when the hinged top cover thereof is opened.

I are arms or fingers each of which is pivoted to the side frame of the gun-casing in a position to enable their free ends to normally project into the cam-groove  $A'$ , in which the horns  $C^x$  on the cartridge-carrier travel as the lock recedes to open the breech. The aforesaid arms are furnished with springs  $I'$ , which retain them in their aforesaid normal position and permit them to give way to the carrier as the latter recedes, but cause them to resume their original position immediately the carrier has passed, so that in the event of the carrier prematurely returning to its original position the arms will act as stops to prevent the nose of the cartridge in the carrier from being brought against the detonator of the cartridge in the feed-box.

K is the feed-lever, which is of similar construction to the feed-lever ordinarily employed in Maxim guns; but in order to decrease the total length of the gun, and thereby to save space, the pivot  $K'$  of the said lever is arranged on the opposite side of the feed-box to which it is usually located.  $K^2$  is a stud on one of the arms of the said lever, which stud engages with a hole or slot in the upper surface of the barrel, and thereby receives its motion from the said barrel.  $K^3$  is a projection or stud on the feed-plate, with which the other arm of said lever engages to actuate said plate and cause the belt to be fed through the gun.

What we claim is—

1. In an automatic gun having a recoiling barrel, a crank-shaft, a reciprocating lock connected therewith, and a sliding inner frame carrying said crank-shaft; the combination of a piston detachably connected to a cross-bar on the said sliding inner frame, of a hydraulic cylinder within which such piston works, of means for detachably connecting said cylinder to the rear plate of the gun-casing and of means for enabling the cylinder to be replenished with liquid without re-

moving the said cylinder substantially as described.

2. In an automatic gun having a recoiling barrel, a crank-shaft, a reciprocating lock connected therewith and a sliding inner frame carrying said crank-shaft; the combination of a piston detachably connected to a cross-bar on the said sliding inner frame by a shoulder on the end of the piston-rod entering a recess in the cross-bar, of a hydraulic cylinder having a tapered bore within which said piston works, of a tubular shank on said cylinder fitting a hole in the end plate of the gun-casing and held in place by a nut screwing onto the external portion of said shank, and of a detachable plug fitting the outer end of the tubular shank, all substantially as described and for the purposes specified.

3. In an automatic gun having a recoiling barrel, a crank-shaft, a reciprocating lock connected therewith and a sliding inner frame carrying said crank-shaft; the combination of a piston detachably connected to a cross-bar on the said sliding inner frame, of a hydraulic cylinder within which such piston works, of means for detachably connecting said cylinder to the rear plate of the gun-casing, of means for enabling the cylinder to be replenished with liquid from the exterior of the gun without removing it, of a casing surrounding said cylinder and communicating therewith, and of a detachable plug on said casing for enabling it to be charged with liquid substantially as described.

4. In an automatic gun having a recoiling barrel, a crank-shaft, a reciprocating lock connected therewith, and a sliding inner frame carrying said crank-shaft; the combination with the barrel and within the water-jacket of a sleeve larger than the barrel but secured to the same near its forward end, and a short recoil-spring surrounding the barrel and interposed between the rear end of said sleeve and an abutment or partition in said water-jacket as set forth.

5. In an automatic gun having a recoiling barrel, a crank-shaft, a reciprocating lock connected therewith and a sliding inner frame carrying said crank-shaft; the combination with the barrel and within the water-jacket of a sleeve larger than the barrel but secured to the same near its forward end, and provided with perforations or openings which permit free access of the water to the barrel, and a short recoil-spring surrounding the barrel and interposed between the rear end of said sleeve and an abutment or partition in said water-jacket, as set forth.

In testimony whereof we have hereunto set our hands, in presence of two subscribing witnesses, this 18th day of March, 1899.

ARTHUR TREVOR DAWSON.  
LOUIS SILVERMAN.

Witnesses:

WALTER W. SHARPE,  
HENRY KING.