

Sept. 3, 1935.

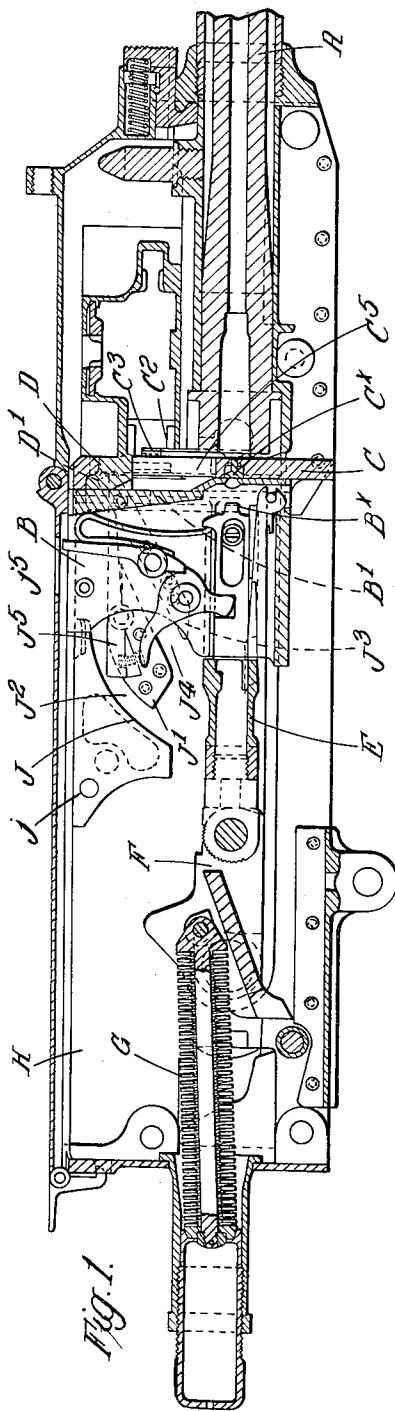
C. A. LARSSON ET AL

2,013,312

MACHINE GUN

Filed Jan. 2, 1934

2 Sheets-Sheet 1



Inventors
Carl Alfred Larsson
Percy Reuben Stigson
By Lemuel Harris Martin & Edmonds
Attorneys

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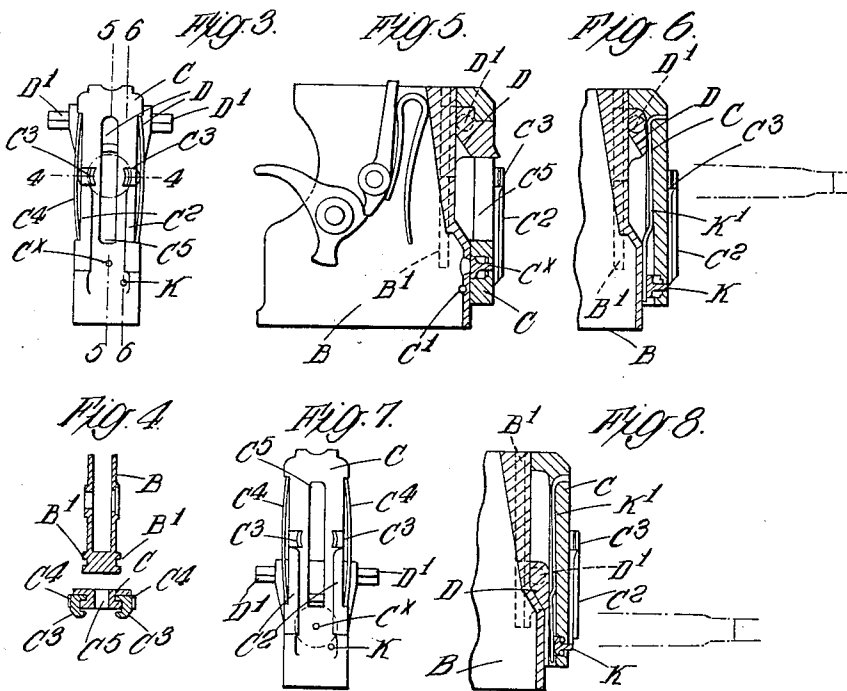
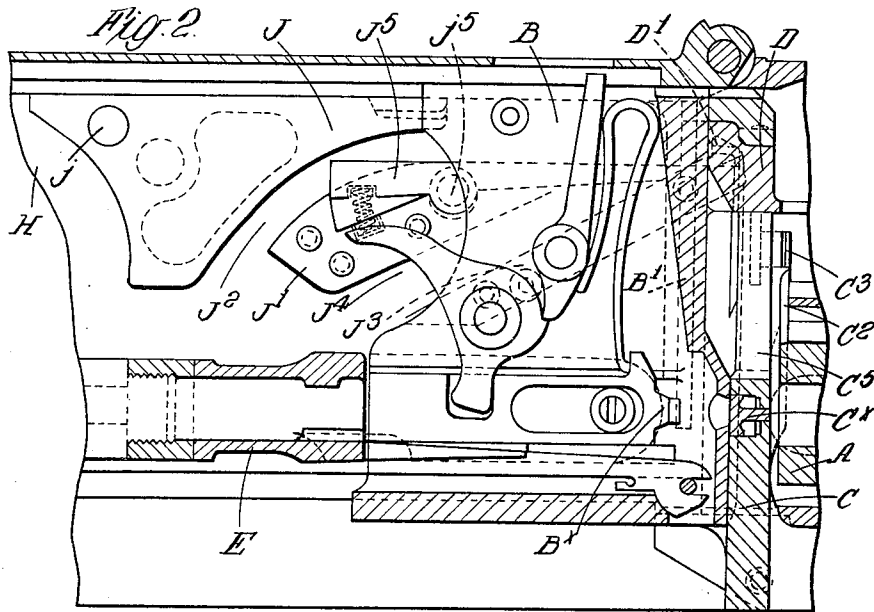
C. A. LARSSON ET AL

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MACHINE GUN

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2 Sheets-Sheet 2



Inventors
Carl Alfred Larsson
Beryl Reuben Stigson
By Bernice Davis Martin & Edmonds
Attorneys

UNITED STATES PATENT OFFICE

2,013,312

MACHINE GUN

Carl Alfred Larsson and Percy Reuben Higson,
Westminster, England, assignors to Vickers-
Armstrongs Limited, Westminster, England, a
British Company

Application January 2, 1934, Serial No. 704,834
In Great Britain February 6, 1933

4 Claims. (Cl. 89—3)

This invention relates to machine guns of the barrel recoiling type and has for its chief object to provide an improved construction of lock which enables greater speeds of firing to be obtained than has heretofore been possible. The well known Vickers type of lock as at present constructed has an extractor which moves up and down during the operations of withdrawing a cartridge from the belt or drum, placing the cartridge in position for insertion into the barrel, and engaging with a fresh cartridge and this extractor has to be moved to its uppermost position by means of lifting levers. The extractor and the levers are of substantial weight and this fact militates against any substantial increase in the speed of firing.

The chief object of the invention is to reduce the weight of the vertically moving parts. Another object is to support and actuate the various parts in a balanced manner to minimize friction.

In order that the invention may be clearly understood and readily carried into effect the same will now be described more fully with reference to the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section of a machine gun showing a constructional form of our improvements,

Figure 2 is an enlarged view of the lock frame, the cartridge transporter, and associated parts,

Figure 3 is a front elevation of the extractor, the cartridge transporter and associated parts, the cartridge transporter being in its highest position,

Figure 4 is a section on the line 4—4 of Figure 3,

Figure 5 is a section on the line 5—5 of Figure 3 showing the cartridge transporter in its highest position,

Figure 6 is a local section on the line 6—6 of Figure 3 also with the cartridge transporter in its highest position, this figure also showing the aforesaid small spring plunger in its inoperative position,

Figure 7 is a view similar to Figure 3 but with the cartridge transporter in its lowest position, and

Figure 8 is a view similar to Figure 6 with the cartridge transporter in its lowest position and also with the small spring plunger in its operative position.

Referring to Figures 1 and 2, A is the recoiling barrel, B is the lock frame, C is the extractor, D is the cartridge transporter, E is the connect-

ing rod, F is the crank, G is the recoil spring (constructed and arranged in the manner described in the specification of our concurrent patent application No. 704,835, filed Jan. 2, 1934, and H is one of the side plates of the gun casing carrying the cams which will be hereinafter described.

The front part of the lock frame B is provided on each side with vertical slots B¹ the upper and lower portions of which receive flanges on the rear part of the extractor C whilst the middle portions of the slots receive and comprise guideways for flanges on the rear part of the cartridge transporter D. The extractor is rigidly connected to the lock by a pin C¹ (Figure 5) but the cartridge transporter is free to move upwards and downwards as will be hereinafter described. The extractor is provided with the usual solid flanges C², C² for engaging with the cartridge case rims and arranged at the upper ends of these flanges there are claws C³, C³ which are controlled by springs C⁴, C⁴ (Figures 3, 4, and 7), so that when the lock moves to its forward position these claws clip over and engage with the rim of the cartridge that is in the extracting position in the feed box or drum. The solid flanges serve as guides for the cartridge case rim during the downward movement of the cartridge under the influence of the transporter D and also serve to extract the fired cartridge case from the barrel. The firing pin is preferably made in two parts, viz., a spring controlled needle C^x in the extractor C and a spring operated rod or hammer B^x in the lock frame.

The transporter D projects through a vertical guide slot C⁵ in the front wall of the extractor and terminates in a claw for engaging with the rim of a cartridge case. This transporter also has lateral horns D¹, D¹ for engaging with the operating cams, which will now be described. There are three such cams on each side plate of the gun casing, viz., an upper cam J (see Figures 1 and 2) with a curved lower surface, an intermediate cam J¹ with a correspondingly curved upper surface so as to provide a curved guideway J² for the horns D¹ of the transporter D during the rearward movement of the lock, and a lower cam J³ with an inclined upper surface to provide in conjunction with a correspondingly inclined lower surface on the intermediate cam J¹, an inclined guideway J⁴ for the aforesaid horns during the forward movement of the lock. One of the side plates of the gun casing is provided with a spring controlled lever J⁵ which is pivoted near its middle (at j⁵) to the side plate and

which serves the double purpose of closing by means of its front limb the upper end of the inclined guideway J⁴ so that the horn cannot enter this guideway during the rearward movement of the lock, and of closing by means of its rear limb the lower end of the curved guideway J² so that the horn cannot pass through this guideway during the forward movement of the lock and also so that in the event of a short recoil occurring the lock is prevented from returning to its forward position. The action of the cams is such that when the lock has recoiled sufficiently to bring the end of a cartridge clear of the feed box or drum, the transporter D is moved downwards by the curved cam J to bring the cartridge into line with the bore of the barrel (the cartridge rim being engaged by the flanges C², C² on the extractor during this time) while during the forward movement of the lock after the cartridge has just been inserted in the cartridge chamber of the barrel, the transporter is lifted to its original position by the cam guideway J⁴. All the aforesaid cams J, J¹ and J³ may be fixed to the side plates, but in order to facilitate removal of the lock when required, the cams J may be pivoted at j to the side plate as shown or alternatively may be carried by the rear hinged cover.

The aforesaid small spring plunger (indicated at K in Figures 3, 6, 7, and 8) for limiting the downward movement of the cartridge is operated by a spring rod K¹ (Figures 6 and 8) arranged vertically behind the extractor in such a position that as the transporter D reaches its lowermost position it engages with a bent part of the said rod, thereby forcing the plunger into its protruding position as shown in Figure 8, for engaging with the rim of the cartridge case. During the upward movement of the transporter the latter moves clear of the spring rod which then moves the plunger to its housed position as shown in Figure 6.

Apart from the features above described the lock is similar to that of the well known Vickers gun.

What we claim and desire to secure by Letters Patent of the United States is:—

1. A machine gun comprising a recoiling barrel, a recoiling lock, a crank connected to the lock and operated by the recoil, a sear carried by the lock and set by the crank on recoil, cartridge guides fixed to the lock frame against vertical movement, a cartridge transporter reciprocating bodily vertically in the lock for pushing the cartridge along the said cartridge guides, vertical guideways in the lock for guiding the transporter, two horns fixed to the transporter one on each side thereof so as to be capable of only vertical movement and which horns are located adjacent to the front of the lock, cam

means forming two cam guideways one on each side of the gun casing for engagement by said horns to effect downward movement of the transporter, said cam means also forming two other cam guideways for engagement by said horns for effecting upward movement of the transporter, and means co-operating with one of the first mentioned cam guideways to prevent forward movement of the horns and other parts should a short recoil inadvertently occur.

2. A machine gun as in claim 1 wherein said means comprise a spring pressed lever, one end of which closes one of the first-mentioned cam guideways against upward movement of the horn therein whilst permitting downward movement of the horn therein, and the other end of which lever closes one of the second mentioned cam guideways against downward movement of the horn therein but permits upward movement of the horn therein.

3. A machine gun as in claim 1, having a plunger carried by the lock and movable only horizontally and adapted in its forward position to limit downward movement of the cartridge in the cartridge guides, a rod fixed against vertical movement and arranged in the path of movement of the transporter and adapted to co-operate with the plunger, said rod being engaged by the transporter at the lower part of the movement of the transporter so as to move the rod and hold the plunger positively in its forward position.

4. A machine gun comprising a recoiling barrel, a recoiling lock, a crank connected to the lock and operated by the recoil, a sear carried by the lock and set by the crank on recoil, cartridge guides fixed to the lock frame against vertical movement, spring cartridge extractor means carried by the lock frame so as to be incapable of vertical movement, a cartridge transporter reciprocating bodily vertically in the lock for pushing the cartridge out of the spring extractor means into and along the said cartridge guides, vertical guideways in the lock for guiding the transporter, two horns fixed to the transporter one on each side thereof so as to be capable of only vertical movement and which horns are located adjacent to the front of the lock, and means forming two cam guides one on each side of the gun casing for engagement by said horns to effect downward movement of the transporter, said cam means also forming two other cam guideways for engagement by said horns for effecting upward movement of the transporter, and means co-operating with one of the first-mentioned cam guideways to prevent forward movement of the horns and other parts should a short recoil inadvertently occur.

CARL ALFRED LARSSON.

PERCY REUBEN HIGSON.