

Feb. 14, 1933.

C. PELO

1,897,710

LIGHT MACHINE GUN

Filed Nov. 4, 1930

2 Sheets-Sheet 1

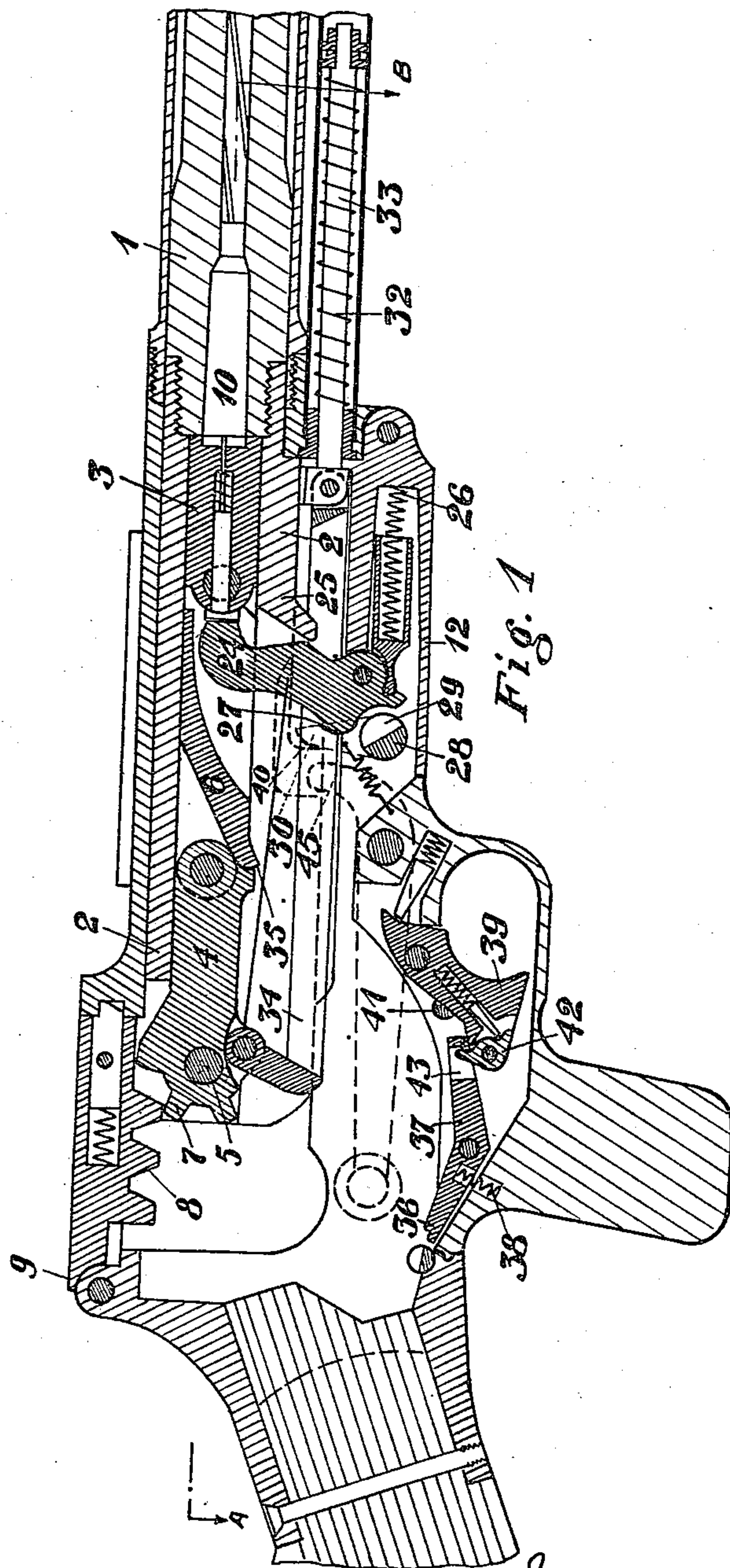


Fig. 1

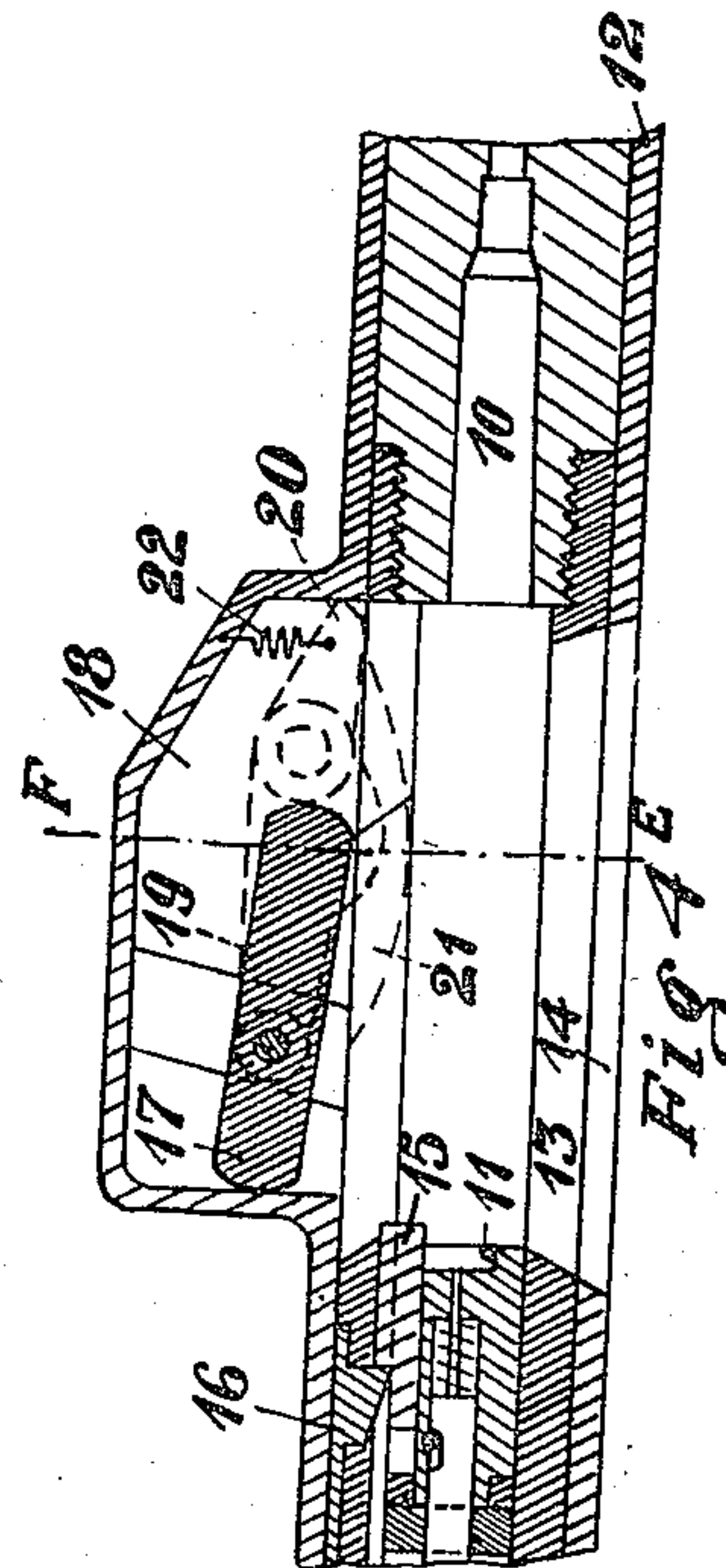


Fig. 4

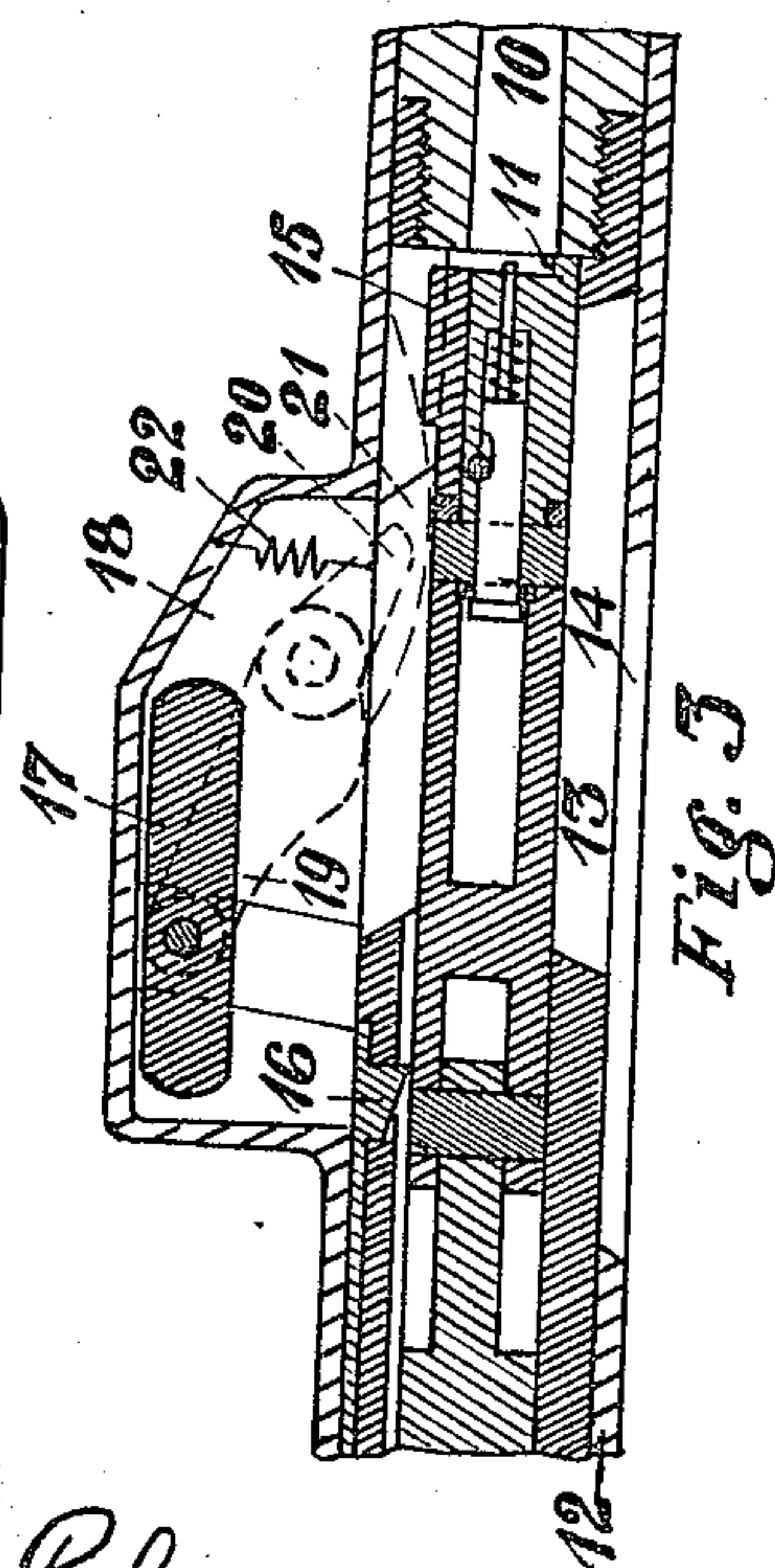


Fig. 3

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2 Sheets-Sheet 2

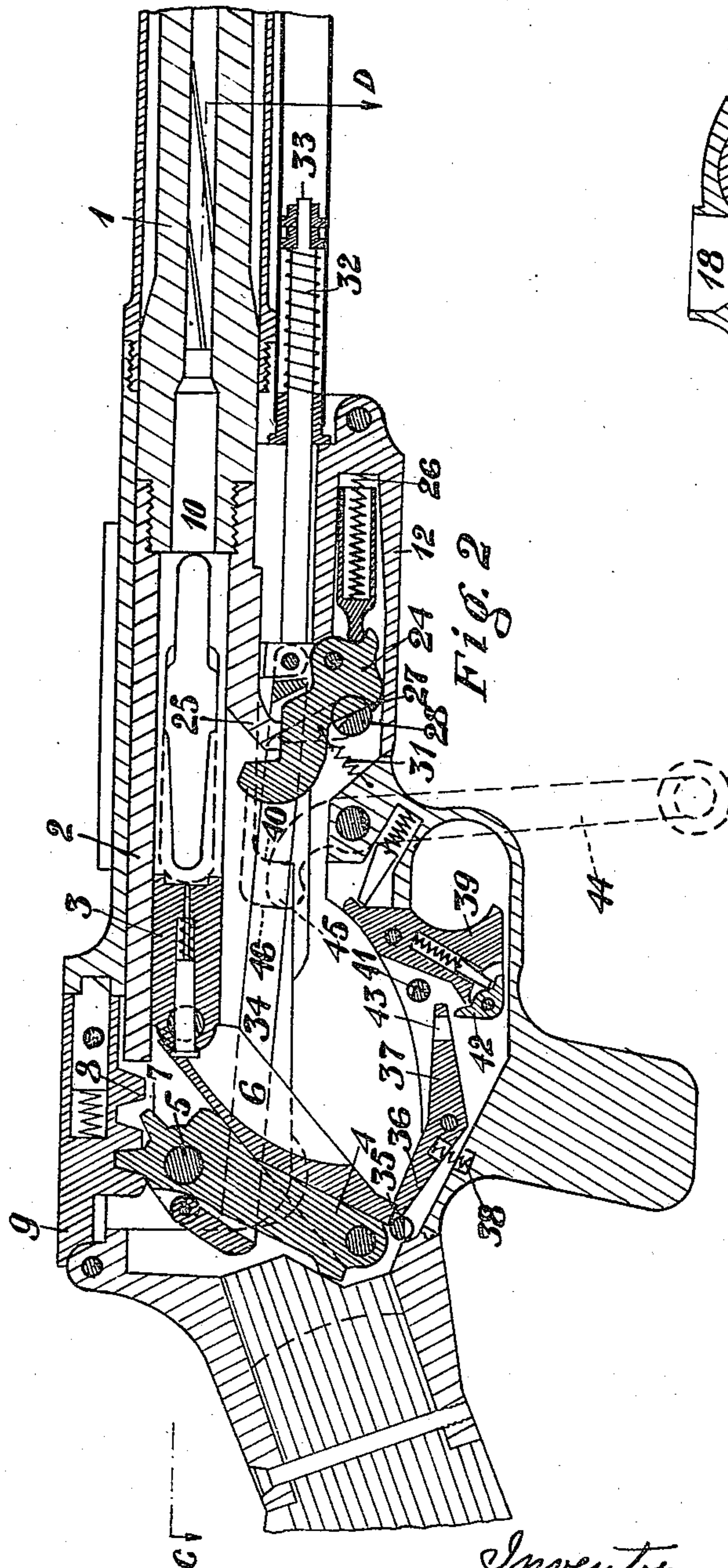


Fig. 2

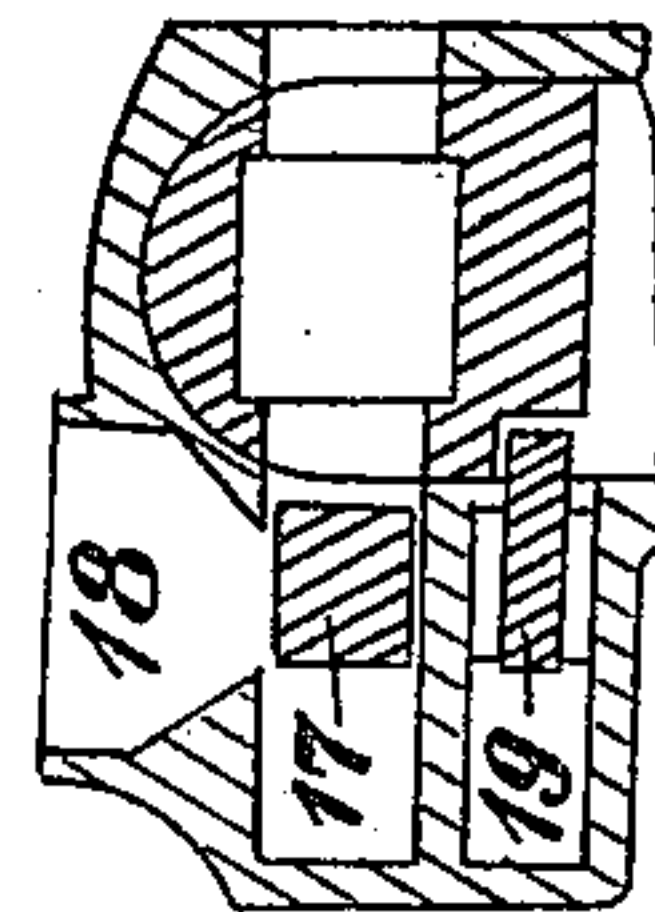


Fig. 3

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UNITED STATES PATENT OFFICE

CARL PELO, OF TAVASTEHUS, FINLAND

LIGHT MACHINE GUN

Application filed November 4, 1930, Serial No. 493,389, and in Finland December 2, 1929.

The present invention relates to light machine guns.

A rate of fire of at least 600-700 shots per minute is required of a light machine gun, for which it is necessary that the movable parts of the gun co-operate with extreme accuracy. Experience has shown that different disturbances very often arise in light machine guns of the various types at present known. The causes therefor are to be attributed to various circumstances. These guns are often constructed of a great many parts, thus obviously increasing possibilities for derangement; the internal parts are often difficultly accessible, thus interfering with rapid repair of the trouble; sometimes the movable parts operate more or less independently of each other, although endeavor has been made to provide positive operation of these parts. It has also been endeavored to make the movement of the breech block positive with respect to the movement of the breech sleeve together with the barrel, but the means used therefor have been shown to be unreliable in operation. This defect is eliminated if, in accordance with the invention, the positive operation is effected by a two-part angle link constructed as a rack drive, which forms the connection between the breech and the slide. A very simple and strong gun construction is produced thereby.

An exemplary embodiment of the invention is illustrated on the accompanying drawings.

Fig. 1 shows a longitudinal section through the gun with its working parts in their foremost position.

Fig. 2 shows a similar section with the working parts in their hindmost position.

Fig. 3 shows the cartridge insertion mechanism seen in section along the line A—B in Fig. 1.

Fig. 4 shows the cartridge insertion mechanism seen in section along the line C—D in Fig. 2.

Fig. 5 is a section along the line E—F in Fig. 4.

By the influence of the reaction pressure of the powder gases the barrel 1 and the barrel extension 2, which is in rigid connection

with the barrel, slide backwards. The breech 3 is connected with the barrel extension 2 by connecting linkrods, in the shown example a kneejoint, consisting of a link 4 revolving round a pin 5 in the barrel extension 2 and a second link 6, the ends of which are in turnable connection partly with the breech 3 and partly with the above-mentioned link 4. The end of the link 4 embracing the pin 5 is formed into a toothed segment 7 corresponding with a toothed bar 8 in the lid of the breech box. During the first phase of the backward movement of the barrel extension 2—i. e. as long as the bullet still is within the barrel—the toothed segment 7 does not engage the toothed bar 8 because the kneejoint 4-6 remains stretched so that the breech 3 closes the barrel 1. Any bending of the said kneejoint during the first phase of movement is prevented thereby, as shown in Fig. 1, that one of the teeth in the toothed segment 7 bears on one of the teeth of the toothed bar 8 so that the kneejoint cannot bend before the said tooth of the toothed segment 7 has slid into a space between the teeth of the toothed bar 8.

When the bullet has left the barrel, the toothed segment 7 engages the toothed bar 8 and the kneejoint bends, i. e., the breech 3 opens. The cartridge shell in the cartridge chamber 10 is extracted by the action of the extractor claw 11 and ejected through the outlet openings 13 and 14 in the side walls of the barrel extension 2 and the breech box 12. The ejector device consists of a guide 15 which can be displaced along the side of the breech 3 and during the backward movement of the breech 3 strikes against a stop 16 in the side of the breech box 12 whereby it is pushed forward in relation to the breech 3, the latter continuously sliding backwards whereby the cartridge shell is ejected.

The new cartridge is conveyed on this occasion from the opposite side of the breech box 12 by means of a feed block 17 on the bottom of a feed chamber 18 on which the cartridge magazine is fixed. The feed block 17 swings to and fro by means of a two-armed lever 19, 20, which is fixed to the feed block 17, the movement of the said parts being

thereby positively controlled. During its forward movement the barrel extension 2 pushes the arm 19 of the lever outwards, the arm 20 of the same lever swinging into a recess 21 in the side wall of the barrel extension 2. During the backward movement of the barrel extension the arm 19 again swings into the recess 21, the arm 20 being under the action of a spring 22 which continuously pulls it outwards. Thus the feed block 17 is swung to and fro and inserts every time a new cartridge.

During the backward movement of the barrel extension and the breech the striking hammer 24, which is revolvingly journaled in the lower part of the breech box 12, is cocked by means of a stop 25 on the sliding contrivance 2 which stop strikes against the striking hammer. The spring 26 of the striking hammer 24 is hereby set to act and its catch 27 clicks in behind a catcher consisting of a revolving pin 28, provided with a notch 29 on that side of the pin which is turned against the striking hammer 24. The pin 28 is provided with an arm 30 actuated by a spring 31 which turns the pin 28 in such a direction that the catch 27 is hooked as soon as it has slid through the notch 29.

During the backstroke of the breech 3 and the barrel extension 2 the recoil spring 32 is set to act by a draw rod 33, which is linked to another draw rod 34 revolvingly fixed to the rear link 4 in the kneejoint 3 of the breech. The fore link 6 is provided with a catch 35 which when the barrel extension 2 and the breech 3 are in their hindmost positions conditionally clicks in a recess in the other end 36 of a two-armed lever 36, 37 belonging to the trigger mechanism and being under the action of a spring 38. Condition of the clicking of the catch in the recess is that the lever 36, 37 is not swung out of the path of the link 6 by means of the trigger 39 as shown in Fig. 1. If the end 36 of the lever 36, 37 on the other hand is in the position shown in Fig. 2, the moving parts will remain in their hindmost positions.

We will suppose the case shown in Fig. 1 to be in question. Under the action of the recoil spring 32 the barrel extension 2 and the breech 3 are immediately drawn forward. The new cartridge just conveyed from the magazine will be inserted in the cartridge chamber. When a rigid connection has taken place between the breech 3 and the barrel 1 a stop 40 on the sidewall of the barrel extension 2 strikes against the aforesaid arm 30 on the catcher pin 28 of the striking hammer 24 and turns this pin 28 so that the striking hammer 24 will be released and strike against the firing pin of the breech 3 so that the charge is fired off whereupon the gun reloads itself or in other words a series firing takes place.

The gun may be adjusted alternatively for

series firing or for firing of one single charge by means of an adjusting mechanism in the form of a revolving pin 41 the side of which is provided with a notch. By series firing the pin 41 is adjusted so that the notch is turned towards the trigger 39, which in this case can be brought to its hindmost position. When the notch is turned away from the trigger 39 the latter in consequence of the pin 41 cannot be brought as long rearwards. The gun is in this case adjusted for firing of a single charge.

The trigger 39 is provided with a pawl 42 which when the trigger is pressed backwards raises the arm 37 of the lever 36, 37 so that the working parts are released from the position shown in Fig. 2. The pawl 42 is, however, swung immediately so that the lever 36, 37 can return to its former position under the action of the spring 38 this movement being possible by the means of a notch 43 in the lever in which the end of the pawl 42 enters. If the trigger 39 now can move to its hindmost position the same, after the pawl 42 has entered in the notch 43, will itself bear against the arm 37 of the lever 36, 37 so that said lever is kept out of the path of the catch 36 on the link 6 in the kneejoint of the breech as long as the trigger is pressed down. If the trigger only in a certain degree can move backwards the arm 36 of the lever 36, 37 rises again, the arm 37 in this case not being able to strike against the trigger 39.

Thus either series firing or single firing is possible and in both cases the working parts remain in their hindmost positions and the breech thus remains open after the termination of the firing.

The working parts can be moved backwards by means of a hand lever 44 which is journaled on the side wall of the breech box and with a thumb 45 engages a recess 46 in the side wall of the barrel extension 2. If after the termination of the firing the working parts have been allowed to pass forward by pressure on the trigger, the gun can be reloaded by means of the hand lever 44.

In the drawings only the breech- and feeding mechanisms of the gun are illustrated, but it is understood that the gun is to be provided with the usual elements, such as adjustable sight, stand, etc.

Various modifications of the invention can self-evidently be made within the scope of the following claims.

What I claim is:

1. Light machine gun with positive movement of the breech block relative to the breech sleeve together with the barrel, wherein the breech and slide are connected by a toggle mechanism wherein the link connected with the slide, at its pivot point on the latter, is formed as a gear segment, and a stationary rack is provided in the breech housing, whereby the gear crown rolls along the rack dur-

ing the movement of the rack relative to the slide.

2. Light machine gun with positive movement of the breech block relative to the breech sleeve together with the barrel, wherein the breech and slide are connected by a toggle mechanism, wherein the link connected with the slide, at its pivot point on the latter, is formed as a gear segment, and a stationary rack is provided in the breech housing, and wherein the gear crown and rack are so arranged that, during the first phase of the recoil of the barrel and the last phase of the advance movement, a tooth of the segment is applied against a tooth of the rack and slides along the latter, so that the tooth segment is prevented from rotation.

3. Light machine gun with positive movement of the breech block relative to the breech sleeve together with the barrel, wherein the breech and slide are connected by a toggle mechanism wherein the link connected with the slide, at its pivot point on the latter, is formed as a gear segment and a stationary rack is provided in the breech housing and wherein, for actuating the feed member of the gun, a double armed lever is journalled in the magazine and which, in turn, is actuated by a depression provided in the lateral wall of the slide.

4. Light machine gun with positive movement of the breech block relative to the breech sleeve together with the barrel, wherein the breech and slide are connected by a toggle mechanism wherein the link connected with the slide, at its pivot point on the latter, is formed as a gear segment, and a stationary rack is provided in a part connected to the breech housing, wherein the gear crown rolls along the rack during the movement of the rack relative to the slide.

5. Light machine gun with positive movement of the breech block relative to the breech sleeve together with the barrel, wherein the breech and slide are connected by a toggle mechanism wherein the link connected with the slide, at its pivot point on the latter, is formed as a gear segment, and a stationary rack is provided in a part connected to the breech housing, and wherein the gear crown and rack are so arranged that, during the first phase of the recoil of the barrel and the last phase of the advance movement, a tooth of the rack slides along the latter, so that the tooth segment is prevented from rotation.

In testimony whereof I have signed my name to this specification.

CARL PELO.