

Jan. 12, 1937.

F. HERLACH ET AL

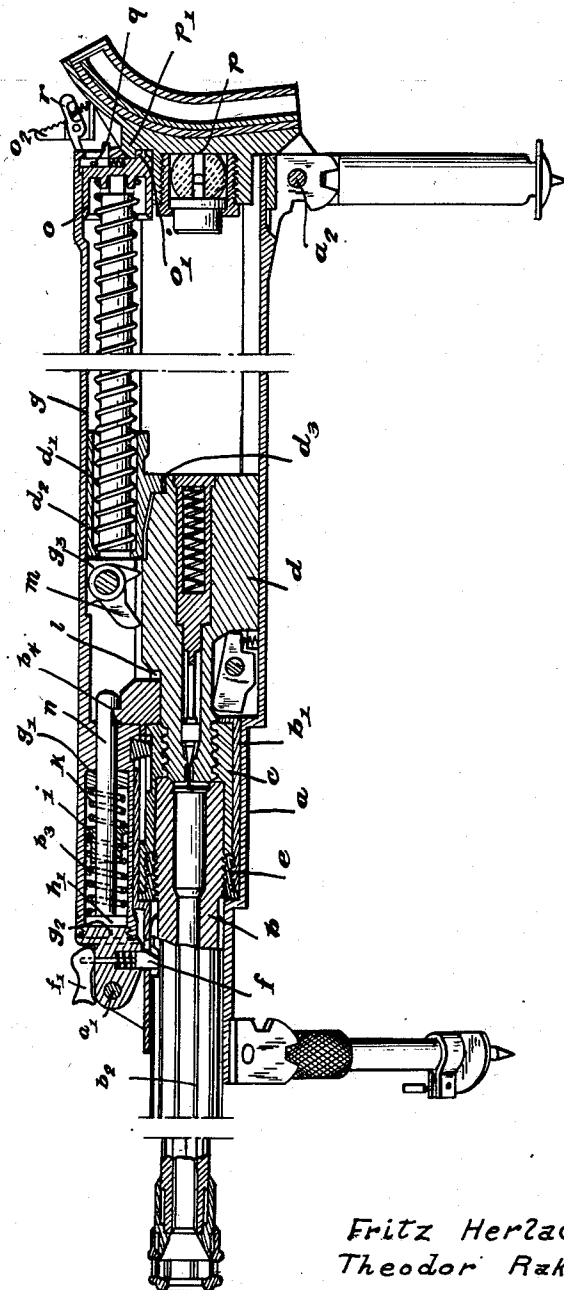
2,067,322

AUTOMATIC GUN

Filed Oct. 16, 1934

2 Sheets-Sheet 1

Fig. 1.



Inventor
Fritz Herlach and
Theodor Rakulz

By *Bonnelycke, Young & Thompson*

Attorneys

Jan. 12, 1937.

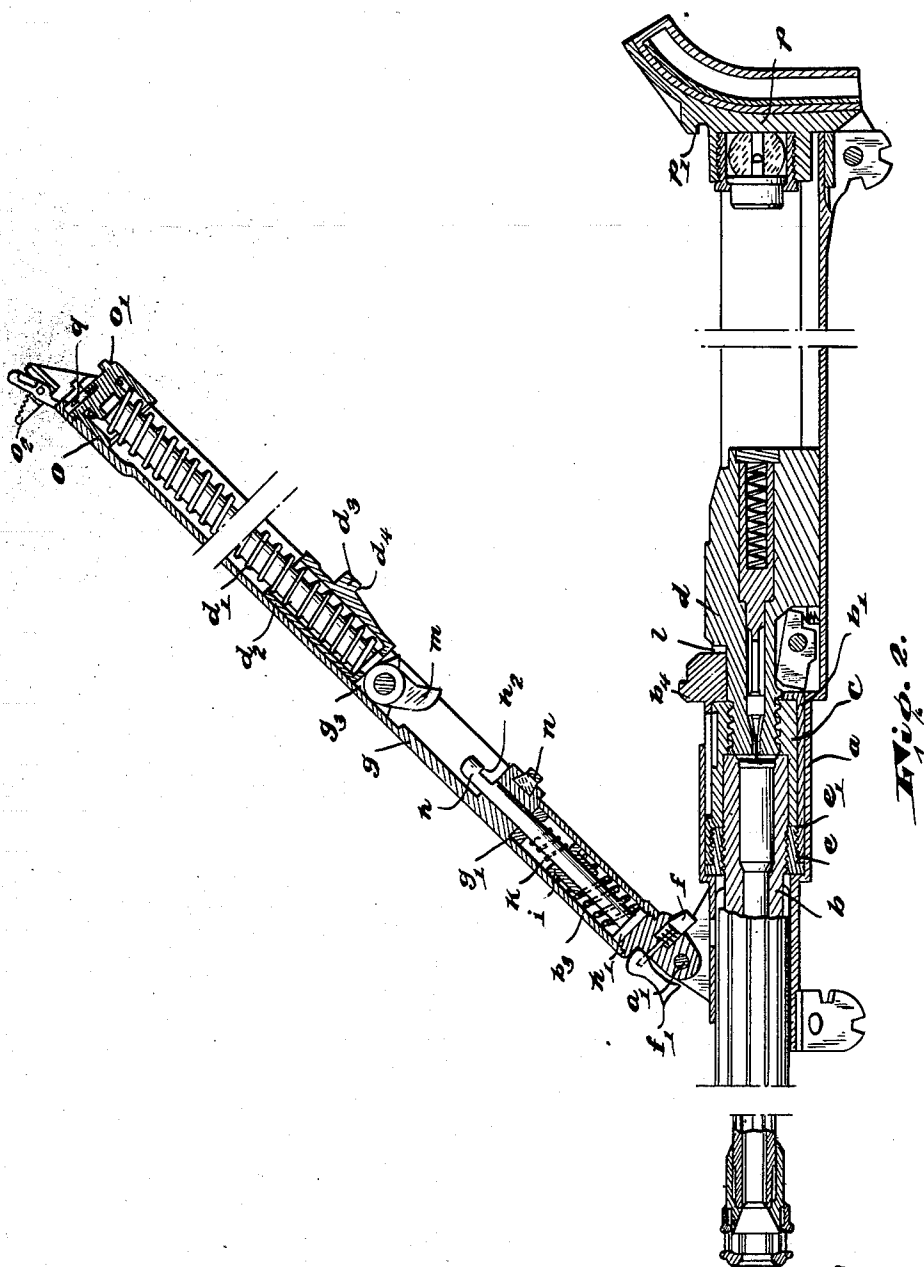
F. HERLACH ET AL

2,067,322

AUTOMATIC GUN

Filed Oct. 16, 1934

2 Sheets-Sheet 2



Inventor
Fritz Herlach and
Theodor Rakulz

By *Bornelycke, Young, Emery & Hoppen*
Attorneys

UNITED STATES PATENT OFFICE

2,067,322

AUTOMATIC GUN

Fritz Herlach and Theodor Rakula, Berlin-Frohnau, Germany, assignors to Waffenfabrik-Solothurn A.-G., Solothurn, Switzerland, a corporation of Switzerland

Application October 16, 1934, Serial No. 748,555
In Germany February 23, 1934

5 Claims. (Cl. 89—3)

In order to render accessible the inner parts of automatic guns, particularly the barrel and breech system, for the purpose of inspection or for changing parts, such guns are generally provided with housing wall members which are hinged or are otherwise removable. In guns having a single spring serving simultaneously as running-out mechanism for the barrel and breech, this spring was heretofore so mounted in a hinged housing cover that on swinging open the cover the spring was disengaged from the sliding members and did not prevent them from being dismounted.

In large calibre machine guns however the running-out mechanism is arranged almost entirely separately and it is not possible to use directly the known expedient of opening a portion of the wall together with the running-out mechanism, since there are means disengaging and engaging the latter with the recoiling parts of the gun.

According to the present invention, in automatic guns having a sliding barrel, a longitudinally movable breech, and a separate running-out device for each of these two parts the entire running-out mechanism is supported in the single movable cover-like part of the housing.

Thus also in the case of guns with separate running-out devices, for the breech and barrel, it is possible, as in guns with a single spring common to the barrel and the breech, by the mere opening of a single part of the housing wall, to bring the barrel and breech system out of cooperation with all the running-out mechanism.

Further, if the gun includes further parts in the housing co-operating and engaging with the barrel-breech system, particularly for example a propelling member for accelerating the backward movement of the breech block relatively to the barrel, a control device for bolting the barrel and breech together, and a barrel securing member, according to the invention these members can also be accommodated together with the barrel and (or) breech-running out mechanism in a part of the housing wall adapted to be opened, and by the opening of which they are rendered capable of being disengaged from the barrel-breech system. Conversely, the closing of the housing brings all its members automatically back into the necessary operative connection with the barrel and breech.

In the accompanying drawings which show an automatic gun of large calibre, which embodies the invention in a typical manner—

Fig. 1 represents a longitudinal section through the closed gun;

Fig. 2 represents a longitudinal section with the gun housing open.

The gun housing *a* accommodates in known manner the slidably mounted barrel *b* and the longitudinally displaceable breech block *d* adapted to be bolted to the barrel by a rotatable ring *c* in the barrel casing *b*₁. The barrel *b* is connected by a bayonet connection with a nut *e* having an outer thread *e*₁ engaging the barrel casing *b*₁. In order to lock the bayonet connection, the barrel *b* is prevented from turning by a locking member *f*, which engages in one of the groove-like recesses between the cooling fins *b*₂.

In a housing cover *g* hinged about a pin *a*₁, there are mounted the running out members, viz., barrel running out spring *b*₃ and the breech closing spring *d*₁. The front end of the barrel running out spring *b*₃ acts on the collar *h*₁ of a spring bolt *h* displaceably mounted in the cover *g*, which bolt is provided with a rear, forked head, which engages—when the cover is closed—over a projection *b*₄ on the barrel casing *b*₁. At the rear, the barrel running out spring *b*₃ bears against a buffer device consisting of a sleeve *i*, displaceably mounted on the spring bolt *h*, and a buffer spring *k* which bears against the sleeve *i* and against the bolt guide bearing *g*₁. The closing spring *d*₁ for the breech block is mounted in the rear part of the cover *g*; a displaceable front sleeve *d*₂ acted on by the front end of the spring *d*₁ engages by means of a stud-like projection *d*₃ in a corresponding recess in the breech block *d*. Abutments *g*₂ and *g*₃ on the cover respectively limit the motion of the spring-urged members *h*₁ and *d*₂ in such a position that when they are in engagement with the corresponding members in the barrel and breech block and these latter members are located in their front end position in the gun housing, they are pressed backward to a slight extent. For this purpose inclined surfaces *h*₂, *d*₄ (Fig. 2) are provided on the spring-urged members *h* and *d*₂. This pretensioning of the barrel running out spring *b*₃ and the closing spring *d*₁ prevents play in the movable parts of the gun.

Besides the barrel running out spring *b*₃ and the closing spring *d*₁ there are mounted in the housing cover *g*, a propelling pawl *m* which, on the recoil of the barrel-breech system after the unbolting of the breech, is inserted between these parts—in the example illustrated in the gap *l* for transmitting energy from the barrel to the breech with velocity ratio modified by the leverage of the pawl—a control pin *n*, which is located near the guide bearing *g*₁ in the cover, for

the turning of the bolting sleeve *c* and the spring-urged locking member *f* for preserving the bayonet connection of the barrel and barrel casing. The propelling pawl acts as means to accelerate the recoil of the breech block relatively to the barrel, because when the pawl *m* drops into the gap *l*, the point of contact between the projection *b*₁ on the barrel casing and the curved front of the pawl shifts more and more during the recoil towards the axis of the pawl whereby the barrel movement is transmitted with gradually increasing leverage to the breech block and the movement of the latter accelerated. Thus all parts co-operating with the barrel-breech system are raised from their position of engagement by the mere opening of the cover *g*.

Also the barrel locking member *f* thus is disengaged when the cover *g* is opened about its hinge. Means are also provided for enabling the member *f* to be independently operated by hand. The member *f* has a springloaded locking pin, with an external handle *f*₁ and the inner end of the member is adapted to be raised out of the locking position by turning the handle *f*₁.

The cover *g* is held fast in the firing position by a sliding sleeve *o* having a nose *o*₁ which engages under a projection *p*₁ of the shoulder support which forms the rear gun closing member and is adapted to be swung backwards. The sliding sleeve *o* is secured against turning by a spring catch *q*, and against axial displacement by a spring-loaded blocking lever *r*.

In order to open the cover *g*, the lever *r* must be swung out of its blocking position and then the slide *o* by means of the handle portion *o*₂ is thrust axially forward until its nose *o*₁ has passed away from the projection *p*₁ of the housing closing member *p* against the influence of the closing spring *d*₁. The cover now being openable, the rear gun closing member *p* can be swung about pin *a*₂ so that the barrel breech system, freed from spring tension by the opened cover and also otherwise unhindered by any part of the gun engaging therein, can be drawn out backwards. After the barrel-breech system has been reinserted in the front of the housing, the gun is made ready for firing again by swinging up the shoulder support *p* and closing the cover *g*.

We claim:—

1. An automatic gun of the character described comprising in combination a housing; a barrel and a breech block both longitudinally movable in said housing; separate running-out devices for the barrel and breech block; a single member on the housing for supporting both the running-out devices, said member being movable away and onto the housing to carry both running-out devices out of and into cooperation with the barrel and breech; and means in said member for accelerating the recoil of the breech block relatively to the barrel the accelerating means also being carried out of and restored to cooperation with the recoiling parts when said member is moved away from and returned onto said housing.

2. An automatic gun of the character described comprising in combination a housing; a barrel and a breech block both longitudinally movable in said housing; separate running-out devices for the barrel and breech block; a single member on the housing for supporting both the running-out devices, said member being movable away from and onto the housing to carry both running-out devices out of and into cooperation with the barrel and breech; abutments in said single

member for retaining the running out devices, when the member is moved away from the housing, in tensioned condition ready to again co-operate with the barrel and breech block upon returning said member onto the housing; and automatic coupling means between the barrel and the breech block said means including a control device mounted in said movable member and movable therewith into and out of operative position.

3. An automatic gun of the character described comprising in combination a housing; a barrel and a breech block both longitudinally movable in said housing; separate running-out devices for the barrel and breech block; a single member on the housing for supporting both the running-out devices, said member being movable away from and onto the housing to carry both running-out devices out of and into cooperation with the barrel and breech; automatic coupling means between the barrel and the breech said means including a control device mounted in said movable member and movable therewith into and out of operative position; and means in said member for accelerating the recoil of the breech block relatively to the barrel the accelerating means also being carried out of and restored to cooperation with the recoiling parts when said member is moved away from and returned onto said housing.

4. An automatic gun of the character described comprising in combination a housing; a barrel and a breech block both longitudinally movable in said housing; separate running-out devices for the barrel and breech block; a single member on the housing for supporting both the running-out devices, said member being movable away from and onto the housing to carry both running-out devices out of and into cooperation with the barrel and breech; automatic coupling means between the barrel and the breech said means including a control device mounted in said movable member and movable therewith into and out of operative position; means in said member for accelerating the recoil of the breech block relatively to the barrel the accelerating means also being carried out of and restored to cooperation with the recoiling parts when said member is moved away from and returned; and abutments in said single member for retaining the running-out devices, when the member is moved away from the housing, in tensioned condition ready to again cooperate with the barrel and breech block upon returning said member onto the housing.

5. An automatic gun of the character described comprising in combination a housing; a barrel and a breech block both longitudinally movable in said housing; separate running-out springs for the barrel and breech block; a cover member hinged to the housing and supporting both the running-out springs, said cover member in open position carrying both running-out springs out of cooperation with the barrel and breech and when closed bringing said springs into cooperation with the barrel and breech; abutments in said cover member for retaining the running-out springs when the cover is open in tensioned condition ready to again cooperate with the barrel and breech block upon closing the cover; means for relieving the abutments of the reaction of the running-out springs when the cover is closed; means on the cover for accelerating the recoil of the breech block relatively to the barrel, said accelerating means also being car-

ried out of and restored to cooperation with the recoiling parts when the cover is opened and closed; automatic coupling means between the barrel and the breech block, said means including
5 a control device mounted in the cover and movable therewith into and out of operative position; a barrel casing in which the barrel is movably

mounted, said casing recoiling with the barrel; and a lock for securing the barrel in the casing, said lock being so mounted on the cover that it is carried into and out of operative position when the cover is opened and closed. 5

FRITZ HERLACH.
THEODOR RAKULA.