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GUNS HAVING SLIDING AND EXCHANGEABLE BARRELS

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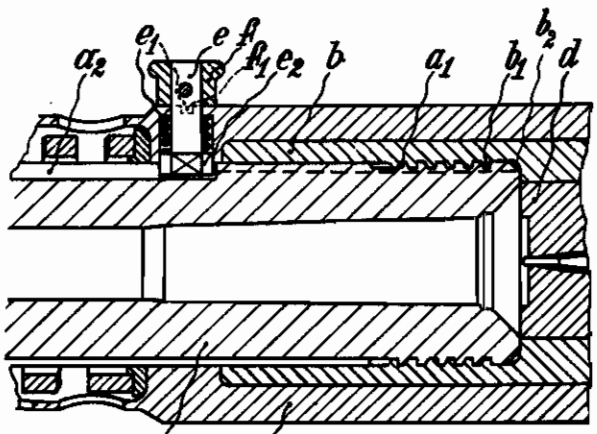

Fig. 1

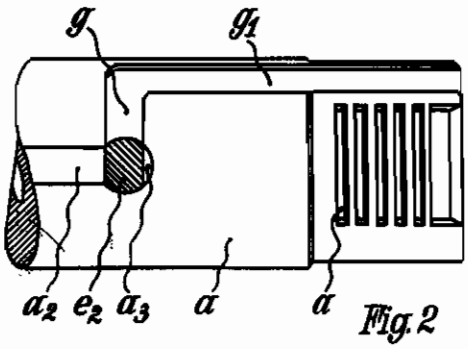

Fig. 2

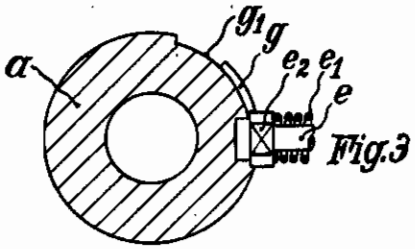

Fig. 3

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GUNS HAVING SLIDING AND EXCHANGEABLE BARRELS

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In guns having exchangeable barrels, barrel-securing devices are known which automatically prevent a shot being fired when the barrel is not properly positioned in the gun or when the barrel is not properly locked. In the known arrangements a safety member, influenced by the coupling of the breech casing to the barrel, immediately locks the breech mechanism when the barrel is imperfectly coupled with the gun, so that it is impossible for the gun to be loaded unless the barrel has been coupled satisfactorily.

Furthermore, it is known in connection with guns having a sliding and exchangeable barrel to couple the barrel and a locking sleeve in such a manner that a guide member mounted in the gun casing engages, in the coupling position, in longitudinal grooves in the barrel and thus axially locates the barrel.

The invention is concerned with the problem of providing an improved safety-device of the last named type in such a manner that the manipulation of the safety-device itself and also of the barrel is simplified by means which control the assembling and dismounting movement. According to the invention, with this object in view at the rear end of the known longitudinal groove there is connected a guide groove which affords positive guidance to the barrel over the entire course of its assembling and dismounting movement, and in which the guide member can enter after having been removed from the longitudinal groove. When the guide groove is given a suitable shape, by means of the invention an improvement in such barrel safety-devices is obtained, which is intended to prevent the gun from being cocked when the barrel has not been completely coupled, in that the barrel is prevented from being clamped while it is imperfectly coupled—which is possible with the known safety devices. This result is obtained by the guide groove first running transversely to the longitudinal groove on the barrel in accordance with the length of the locking teeth, and then parallel to the said longitudinal groove as far as the rear end.

The engagement of the axial guide for the barrel forming the conclusion of the mounting of the barrel, calls attention from the outset to the proper or improper performance of the locking of the barrel. If the axial guide for the barrel does not engage—owing to a faulty barrel coupling or accidental omission owing to lack of attention, the guide in conjunction with the transverse groove of the barrel prevents the barrel from being moved back for the loading process, and thus compels the gunners first of all to bring the barrel fixing into a satisfactory coupled state.

The drawings illustrate a typical embodiment of the invention, namely a large-calibre machine gun having a sliding barrel, a locked breech, and a barrel fixing of the bayonet catch type.

Fig. 1 shows a longitudinal section through the middle part of the gun.

Fig. 2 shows a cross-section at the level of the axial guide for the barrel, and

Fig. 3 is a plan of the barrel showing the arrangement of the assembly and dismounting grooves on the gun casing.

The barrel *a* of the gun is adapted to be removed from the gun casing *c* either alone from the front in known manner, or from the rear together with the breech casing *b*, and the breech block *d* which is adapted to be locked thereto. The breech block is locked in a manner which is usual in guns of the kind in which the breech block *d* does not open in order to eject a fired cartridge or for loading, and also just after a change of barrel has been made, until it has covered a certain distance in the backward direction, in the condition in which it is closed and locked with the breech casing *b* and the barrel *a*.

In order that it may be fixed in position the barrel *a* has, at its rear end, two uniform rows of bayonet catches or teeth distributed over its periphery, which locking teeth when the barrel *a* has been inserted in the proper manner, engage over their entire width with counter teeth b_1 on the breech casing *b*, this casing being so arranged as closely to embrace the barrel at its front portion over a considerable length.

In the coupled position shown in Fig. 1 the barrel *a* is secured by a locking pin *e* which is mounted in the gun housing, and, under the influence of a spring e_1, is thrust inwards so as to locate a projection e_2 in a slide groove a_2 and thus axially position the barrel. The projection e_2 consists of a guide shoe the width of which corresponds to the width of the guide groove a_2, but having a greater length, the shoe being obtained in the example shown by flattening two sides of a cylindrical head.

On the knob *f* of the pin *e* which projects from the gun casing *c*, there are provided projections f_1 which engage in corresponding notches in the gun casing *c* and thus secure the shoe e_2 in the position necessary to enable it axially to guide the barrel. By raising the pin *e* against the pressure of the spring e_1 until the projections f_1, disengage from the notches in the casing, the knob *f* with the pin *e* can be turned, and after

turning through 90° can be fixed in a raised position which brings the foot of the shoe e_2 in alignment with an assembly or dismounting axially transverse groove g on the barrel casing.

For this purpose, as may be seen from Figs. 2 and 3, there is provided at the intersection of the longitudinal groove a_2 and the peripheral transverse groove g a cylindrical recess a_3 the diameter of which corresponds to the maximum superficial or longitudinal dimension of the shoe e_2, and the depth of which is such that the walls of the recess extend to the base surface of the groove which runs longitudinally on the barrel casing. The arrangement of the recess a_3 and the projections f_1 permits of the turning of the shoe e_2 into the position necessary to enable the barrel to be changed and in this position the base surface of the shoe e_2 is raised level with the bottom of the transverse groove g, but is not high enough to be flush with the peripheral surface of the barrel. The sliding shoe e_2, when in the raised and turned position, thereby forms, in the assembly and dismounting of the barrel, an abutment that prevents the barrel from being drawn back when the coupling of the barrel has not been properly carried out and secured and thus precludes the possibility of the gun being loaded in such case. To the transverse groove g, there opens a longitudinal groove g_1 which extends towards the rear end of the barrel, the length of the groove g depending on the peripheral length of the locking teeth a_1 on the barrel while the width of the groove g_1 corresponds to the greater or longitudinal dimension of the slide shoe e_2.

It is possible for the barrel to be removed from the front only when the various gun members are in the front end position as otherwise the axial locating member e_2 would not lie opposite transverse groove g. After the pin e has been raised and turned through 90°, the slide shoe stands in the position shown in Figs. 2 and 3, i. e. with its narrow side disposed to the groove g so that an unbolting, pivotal movement of the barrel a can take place. The disengagement of the barrel teeth a_1 from the counter teeth b_1 in the breech casing is completed as soon as the longitudinal groove g_1 of the barrel, which extends rearwards at right angles to the groove g, comes opposite the shoe g_2. Any further pivotal movement of the barrel in the unlocking direction is thus prevented. Now, the barrel can be drawn forward axially and withdrawn from the breech casing b and, therefore, from the gun.

A new barrel can be inserted only when it occupies an angular position which is determined by the guiding of the slide shoe e_2 in the longitudinal groove g_1, when, the breech casing being in its forward end position in the gun, the insertion of the barrel automatically brings the teeth a_1 opposite the gaps of the locking teeth b_1 of the breech casing b. The limitation of the inward movement of the barrel, to the position in which the teeth of the barrel a and of the breech casing b are correctly relatively disposed to enable the barrel and breech casing to be locked together, which is effected by the striking of the shoe e_2 against the front wall of the transverse groove g, prompts the turning movement necessary for the locking operation. When the barrel attains the completely coupled position, this position is indicated by the abutment of the shoe e_2 against the walls of the circular recess a_3. If now the shoe e_2 is turned back through 90° until the projections f_1 engage in the grooves in the casing, the barrel a is fully secured and the gun is again ready for loading.

In the present case the locking teeth on the barrel a and the breech casing b have no screw pitch, so that when the barrel is inserted its linear inward movement is limited by the rear end of the barrel striking against the shoulder b_2 of the breech casing b.

If the locking teeth of the barrel a and the breech casing b have a coarse screw pitch, for instance in order to loosen the cartridge case during the unbolting operation, then, naturally, the transverse groove g must also be given a corresponding inclination. In this case the barrel would be prevented from being inserted further than the proper locking position merely by the co-action of the shoe e_2 and the groove g.

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