

June 6, 1967

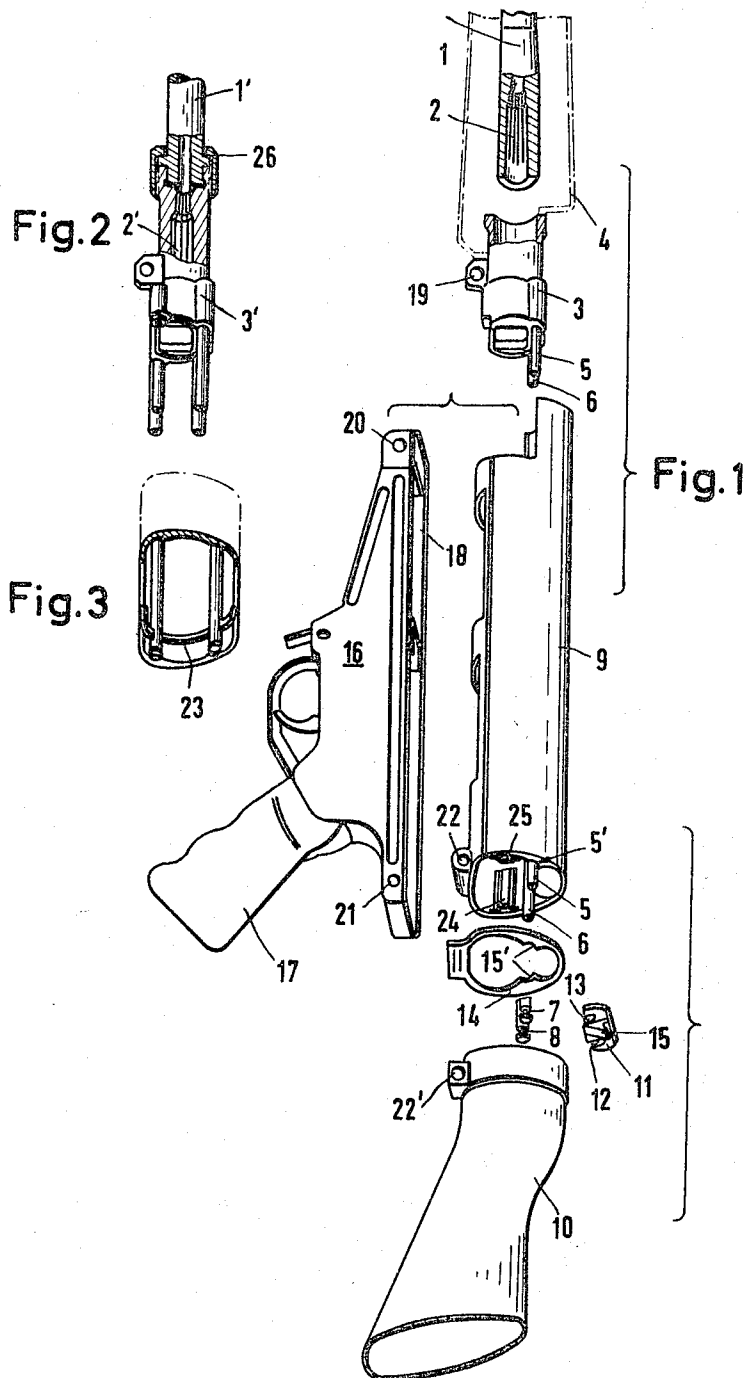
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AUTOMATIC FIREARM ASSEMBLY

Filed Oct. 26, 1965

2 Sheets-Sheet 1



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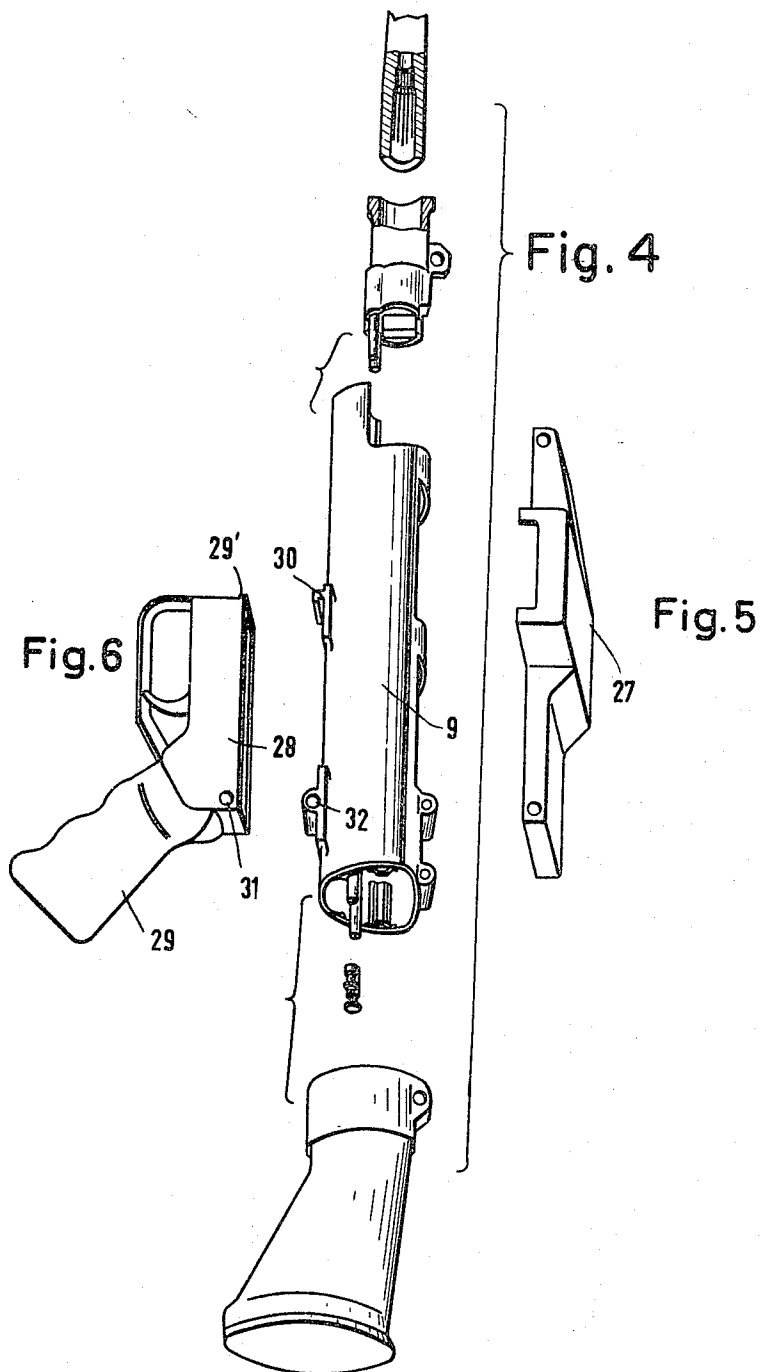
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AUTOMATIC FIREARM ASSEMBLY

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19 Claims. (Cl. 42—75)

ABSTRACT OF THE DISCLOSURE

A system of semiautomatic and automatic firearms are assembled from a plurality of basic structural units adaptable to more than one assembly configuration.

This invention relates to automatic firearms and, more particularly, to such firearms including a plurality of structural units including a casing, a stock adapted to be removed from the casing, and a connecting element such as a trigger box detachable from the casing and stock and equipped with a grip.

It is an object of this invention to provide automatic firearms which can be assembled from a plurality of structural units and which are of simple and economical manufacture, of comparatively low weight and which can be assembled without complicated production equipment. An additional object of this invention is to render possible simple and rapid assembly and repair, as for example, of damaged or worn-out structural units, especially under emergency conditions, if required.

According to the present invention, the basic body of an automatic firearm consists of a total of four structural units, namely a barrel with a locking piece, a casing proper, a stock, and a connecting element. The barrel and locking piece, casing and stock units are connected to one another by means of tie rods, with the connecting element being used as an additional connecting element for the other three structural units.

In order to reduce the cost of construction and save weight, the tie rods can also be used, with advantage, as guide elements, for example, for the breech mechanism of the firearm.

In accordance with a subsidiary feature of this invention, a considerable saving in weight is obtained when the casing consists of a shell part of light construction, such as of light metals, reinforced plastics or the like, with the structural elements which are actually load-bearing or stressed, such as, for example, guides for breech mechanism members, distance rings for the tie rods or the like, secured in the shell part as by casting or by being molded-in during injection molding of the shell part.

According to another subsidiary feature of the invention, and in order to obtain a connection of the above-mentioned structural units which is free from play, a resilient element, for example a bent or corrugated plate spring acting in the axial direction, is arranged between the stock and the casing. This plate spring preferably has its external contours adapted to the connection cross-section of the casing and/or of the stock. To simplify assembly as a whole, the resilient element may also be of annular form and be located in the region of the tie rods with guides open on one side. The resilient element also serves to compensate for shrinkage occurring on the injection molding or drawing of the plastics shell for the casing, etc.

In order to accommodate modification of the firearm to a somewhat different function, the connecting element may be either of two mechanisms. More particularly, that

element may be a magazine box and handgrip or may be a belt feed mechanism. The latter mechanism, which is suitably designed for this purpose, is installed after rotation of the barrel with locking piece and casing through 180° about the longitudinal axis of the firearm, i.e. into an inverted position, when it is desired to use the firearm as a machine gun for belted ammunition.

Some of the objects and advantages of the invention having been stated, others will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

FIGURE 1 is an exploded perspective view of a firearm comprising four structural units, in accordance with this invention;

FIGURE 2 is a perspective view of a modified form of the firearm of FIGURE 1;

FIGURE 3 is a perspective view partly in section of a portion of the firearm of FIGURE 1;

FIGURE 4 is a view similar to FIGURE 1, of a modified form of firearm in accordance with this invention;

FIGURE 5 shows a detail of a belt feed associated with a firearm of this invention; and

FIGURE 6 shows a modified form of a grip with a trigger box.

Referring now more particularly to the drawings, a firearm is shown in FIGURE 1 which has a barrel 1 with a chamber 2. Secured to the barrel is a locking piece 3 for the breech mechanism, and a hand guard 4. Two tie rods 5, 6 are screwed to the locking piece 3, are preferably tubular for reasons of light construction, and are provided with annular grooves 7 and 8, respectively, at their ends. The firearm also includes a casing proper 9 and a stock 10.

Assembly of the above-mentioned structural elements is effected by the casing 9 being positioned encircling and being pushed along the tie rods 5, 6 in the direction of the parts 1 to 4, i.e. on to the barrel and locking piece group, by means of corresponding guide grooves 5' in the casing. Tight clamping of these two structural units is effected at the end of this operation by means of a retaining bolt 11 which has locking recesses 12, 13 for engaging annular grooves 7 and 8, respectively, in the tie rods. Prior to such insertion, a corrugated or bent plate spring 14 which is provided with guides 15' open on one side and encircling the tie rods 5, 6 is also pushed on. Thereafter, a groove or notch (not shown) in the region of the upper front end of the stock 10, facing the casing, is placed over a hook-shaped extension 15 of the retaining bolt 11 to hold the stock in position.

The fourth structural unit or connecting element, preferably consisting of a trigger box 16 with a grip 17 and which forms a single unit with a magazine shaft indicated at 18 when the firearm is to be assembled as an assault rifle, can then be used as an additional connecting element for the other three structural units. To this end, the parts are connected to one another by means of pins inserted into holes 19 to 22'. The bent or corrugated plate spring 14, which can be stressed without difficulty by the lever effect connection of the stock, insures play-free connection of the individual structural groups with one another. Likewise, differences in the longitudinal direction are compensated by the spring 14.

Instead of the two tie rods shown in FIGURE 1, it is within the scope of this invention to employ several tie rods, for instance four, as illustrated in FIGURES 2 and 3. In order to secure exact fixing of the tie rods in the casing, distance rings 23 may be provided, these being fixed to the casing for example by being injection-molded integrally with the shell of the casing. It is also possible to provide special guides for the breech mechanism or

other parts in the casing 9 as indicated in FIGURE 1 at 24, 25.

For reasons of weight saving, the casing 9 is preferably formed by a light weight type of construction (for example with a honeycomb structure) or from profiled tubing, using light materials such as light metals, plastics reinforced with glass fiber or plastic reinforced in another way. The structural elements which are actually load-bearing or stressed, such as the guides for breech mechanism elements, distance rings for the tie rods and other supports, etc., are bedded in the casing as by being cast or injection molded integrally therewith.

FIGURE 2 shows a modified form of the locking piece and barrel structural unit wherein the chamber 2' is not a component part of the barrel 1', as is customary, but instead is a component part of the locking piece 3'. The barrel 1', locking piece chamber 3' and chamber 2' are connected in this construction by means of a coupling nut 26. This arrangement permits interchange of only that part of the barrel which is simpler to produce and subjected to the greatest wear, namely the inner or rifled tube. Furthermore, this arrangement is also advantageous because the chamber can now be hardened together with the locking piece.

The line of division between the barrel 1' and the chamber 2' is advantageously located in the zone of free flight of the bullet, i.e. about 1 to 2 mm. in front of the so-called cartridge mouth. This line of division may also be used with advantage for the tapping off of gas for operating the breech mechanism.

The grip 17 in the lower part of FIGURE 1 is preferably a stamped sheet-metal part. The trigger system is combined as known in a special trigger box and inserted as a single unit in the grip. The grip may also be formed as a light-metal casting with the trigger parts being mounted directly in the grip. Manufacture of the grip from plastic is also quite possible.

FIGURE 4 illustrates the above-described structural units assembled in a modified form of firearm after having been turned through 180° about the longitudinal axis of the barrel. Thus, the firearm may now be regarded as being in an inverted position. However, the connecting element assembling the barrel and locking piece and the casing is now no longer a magazine box and handgrip as in FIGURE 1, but is a belt feed mechanism 27; so that with the same basic components the firearm is now suitable for use as a machine gun instead of as an assault rifle as in FIGURE 1. FIGURE 6 illustrates another design of a trigger box 28 with grip 29, connection to the casing 9 being effected, first, by means of a tongue and

groove joint 29', 30 and, second, by means of an insertion joint 31, 32.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims:

What is claimed is:

1. An automatic firearm assembly including a barrel with a locking piece, a casing, a stock, and a connecting element and comprising means secured to said locking piece and extending through said casing for securing said barrel, said casing and said stock together, and means on said connecting element for securing the same to said locking piece and to said casing and stock.
2. An assembly as claimed in claim 1 wherein said means secured to said locking piece is a plurality of tie rods.
3. An assembly as claimed in claim 2 wherein said tie rods are tubular and define a means for guiding a breech mechanism for the firearm.
4. An assembly as claimed in claim 2 wherein the free ends of said tie rods have means for receiving a retaining bolt for maintaining said casing assembled with said barrel and locking piece.
5. An assembly as claimed in claim 1 further comprising resilient means interposed between said casing and said stock for providing a biasing force axially of the assembly.
6. An assembly as claimed in claim 5 wherein said resilient means is a substantially planar spring member having an outside contour approximating that of said casing and said stock at their point of juncture.
7. An assembly as claimed in claim 6 wherein said spring member is annular and encircles said means secured to said locking piece.
8. An assembly as claimed in claim 1 wherein said locking piece includes a projectile shell case receiving chamber and is separable from said barrel.
9. An assembly as claimed in claim 1 wherein said connecting element is a magazine box and handgrip and is adapted to contain a trigger assembly.
10. An assembly as claimed in claim 1 wherein said connecting element is a belt feed mechanism.

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