

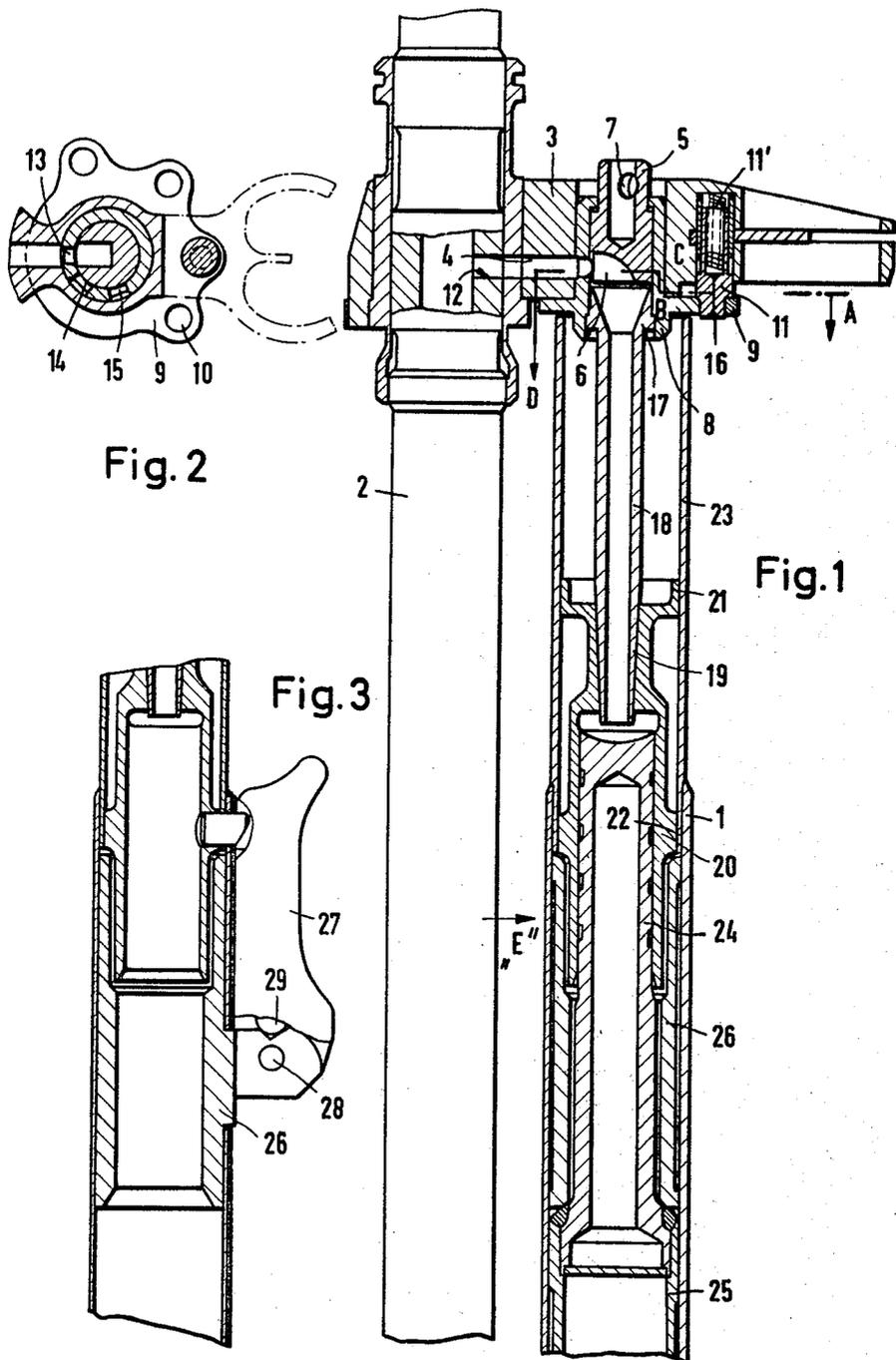
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GAS AND MANUAL OPERATION ASSEMBLY FOR SEMI-AUTOMATIC FIREARMS

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**GAS AND MANUAL OPERATION ASSEMBLY FOR SEMI-AUTOMATIC FIREARMS**

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3 Claims. (Cl. 89—191)

**ABSTRACT OF THE DISCLOSURE**

In a semi-automatic firearm, a gas and manual actuation assembly including a gas cylinder communicating with the barrel, means transmitting operating force to the breech mechanism and including a reduced diameter gas piston portion entering into the gas cylinder to be acted upon by propellant gases, and manual actuation means including a sleeve member encircling the gas cylinder and gas piston and manually operable to engage the force transmitting means.

This invention relates to automatic firearms, such as a gas-operated rifle, which have a rigidly or semi-rigidly locked breech mechanism and, more particularly, to such firearms having a pneumatically operated breech mechanism buffer, the cylinder of which is a component part of the breech mechanism or is connected or coupled to a part of that mechanism during movement, such as for example, the bolt carrier.

It is an object of this invention to provide an improved gas-operated weapon based on an assault rifle presently in use by the armies of Germany and other member nations of NATO, without abandoning the successful basic conception of that rifle, and with a minimum of changes in the construction thereof. This rifle is an automatic rifle having a semi-rigid bolt locked by rollers and is identified in Germany as Pattern G 3. In particular, the arrangement of the cocking slide of the breech mechanism is to remain unchanged as far as possible, so as not to render necessary undesirable additional apertures in the wall of the weapon casing which have a detrimental effect on the stability of the latter, as in the case in certain known machine pistols.

According to this invention, in weapons of the above-mentioned kind, the buffer cylinder has, at its forward end (toward the muzzle), a preferably tubular extension functioning as the gas piston. As a result, the gas piston is more fully integrated into the general construction of the weapon.

Advantageously, a gas cylinder of special construction is associated with the gas piston, namely one which itself comprises a head piece with a longitudinal bore in which the terminal portion of a gas feed tube is effectively secured in gas-tight fashion simply by pushing it in.

By provision of this means, a gas operation system which is of simple construction and assembly and, moreover, inexpensive to produce is obtained. In particular, simplicity and cheapness arise because the insertion end of the gas feed tube is in the form of a cone having a cone angle of less than 20°.

According to another subsidiary feature of the invention, in order to enable the cocking slide for the breech mechanism to be arranged in the customary manner in the gas-operated rifle, the gas cylinder is so designed that there is sufficient space available in its middle section for accommodating the sleeve of the cocking slide.

Some of the objects and advantages of the invention

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having been stated, others will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

FIGURE 1 is an elevation view, partly in section, of a forward end portion of an assault rifle constructed in accordance with this invention;

FIGURE 2 is a section along the line A, B, C, D in FIGURE 1; and

FIGURE 3 is a view from below, partly in section of the parts adjacent the cocking slide of the breech mechanism and its guide sleeve, as seen substantially in the direction of the arrow E in FIGURE 1.

Referring now more particularly to the drawing, a forward portion of an assault rifle is shown which has a casing 1, to which the barrel 2 of the weapon is fixed. On the barrel 2 is mounted a front sight assembly indicated generally at 3, which contains a gas duct 4, with deflection of a stream of gas tapped off from the barrel being effected by an intermediate piece 5. The deflection is produced by a substantially arcuate milled recess 16 in the intermediate piece 5. The latter is fixed to the front sight assembly 3 of a pin 7. Arranged concentrically with the intermediate piece 5 is a sleeve-shaped body 8, having a flange 9 which is provided with four locking bores 10 for cooperation with a spring-loaded pin 11 guided slidably in the body of the front sight assembly. In the place of a tapping hole 12 in the weapon barrel 2, the body 8 has a plurality of nozzle-like bores 13, 14, 15 which are of different transverse cross-sectional areas to enable the quantity of gas to be supplied to the gas cylinder, which is still to be described, to be adjusted. This adjustment is effected in known manner by turning the body 8 after the pin 11 has first been forced clear of the flanges 9 against the action of the spring 11'. This can be done, for instance, with the bullet tip of a cartridge, which is pressed against a center punch hole 16 in the pin 11.

Mounted in the sleeve-shaped body 8 is a cylindrical head piece 17 of a gas feed tube 18 which has an insertion end 19 in the form of a cone of small cone angle. The head piece 17 is so mounted in the sleeve part 8 that it is capable of axial movement. Consequently, by simply pushing, the insertion end can be connected in effective gas-tight fashion with the head piece of a gas cylinder 20, which is itself fixed, as for example by welding at 21 and 22, to the casing 1 of the weapon and to a tube 23 mounted on the casing of the weapon. A gas piston 24 is slidably mounted in the gas cylinder 20, the gas piston forming an extension of a buffer cylinder 25. The buffer cylinder is arranged to serve, in conjunction with a damping piston (not shown) arranged at the front end of the breech mechanism carrier, to resiliently absorb surplus impact energy transmitted to the breech mechanism carrier on firing. As will readily be seen, as a result of the step of fitting the gas piston at the front end of the buffer cylinder, a particularly neat solution is obtained from the point of view of design for conversion of the existing firearm of the type described into a gas-operated rifle. At the same time, it is also important that the gas cylinder 20 is so designed (see in particular FIGURE 1) that there is sufficient space available in its middle portion for accommodating the sleeve 26 of a cocking slide 27 having a pivot bearing 28 and a locking device 29 for the two locations of the cocking slide.

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.

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What is claimed is:

1. In a semi-automatic firearm having a barrel, a casing and a breech mechanism, a gas and manual actuation assembly for effecting movement longitudinally of the barrel comprising a gas cylinder within the casing, gas conduit means operatively connecting said gas cylinder and the barrel for admitting projectile propellant gas into said gas cylinder upon firing of the firearm, force transmitting means within the casing and guided thereby for movement longitudinally of the barrel and being operatively connected to the breech mechanism for transmitting force thereto, said force transmitting means including a reduced diameter gas piston portion at the forward extremity thereof and entering into said gas cylinder for reciprocation therewithin, and manual actuation means including a sleeve member within said casing and encircling said gas cylinder and said gas piston, said sleeve member operatively engaging said force transmitting means at a location spaced from said extremity thereof and being adapted for manual reciprocation within the casing to actuate said force transmitting means as required.

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2. A firearm as claimed in claim 1 wherein said gas conduit means connecting said gas cylinder and barrel comprising a gas tube received within a tubular bore at one end of said gas cylinder.

3. A firearm as claimed in claim 2 wherein said tube and tubular bore are conically tapered.

References Cited

UNITED STATES PATENTS

10	1,572,450	2/1926	Swebilius	89—198 X
	2,186,582	1/1940	Gebauer	89—193
	2,462,119	2/1949	Moore	89—193
	2,865,256	12/1958	Marsh	89—191
15	3,225,657	12/1965	Kruzell	89—191

FOREIGN PATENTS

115,901 2/1946 Sweden.

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