This invention relates to improvements in automatic firearms and more particularly to that type of automatic firearm which is operated by gas-pressure developed by the firing of a cartridge and acting upon a piston for effecting the ejection of a fired cartridge and for the insertion of a fresh cartridge.

One of the objects of the present invention is to provide an automatic firearm of the type referred to which is adapted for military use by having means for mounting a bayonet, but which does not require excessive length and its resultant objectionable weight.

Another object of the present invention is to provide a superior automatic firearm of the gas-operated type wherein the gas-cylinder may be conveniently located beneath the barrel without making it necessary to unduly extend the length of the firearm in order to accommodate a bayonet.

A further object of the present invention is to provide a superior firearm of the type above referred to with superior means for mounting a bayonet.

Still another object of the present invention is to provide a superior gas-operated automatic firearm having a superior construction and arrangement of parts whereby the gas-cylinder and associated parts may be readily cleaned.

A still further object of the present invention is to provide a firearm of the type referred to in which the gas-cylinder may be readily demounted and replaced.

Another object is to provide a superior automatic firearm in which a gas-cylinder is removably organized therewith by means of such character as may be released without requiring the use of any special tools and removed by the use of the casing of a cartridge.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art and which are not claimed in any separate application.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a broken view mainly in side elevation and partly in vertical central-longitudinal section of the portion of the firearm immediately adjacent to the combined cylinder- and bayonet-mounting fixture;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a similar view taken on the line 5—5 of Fig. 2;

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 2;

Fig. 7 is a similar view taken on the line 7—7 of Fig. 2;

Fig. 8 is a broken perspective view of the piston together with a portion of the actuating-rod;

Fig. 9 is a perspective view partly in vertical central-longitudinal section of the combined cylinder- and bayonet-mounting fixture;

Fig. 10 is a perspective view of the gas-cylinder;

Fig. 11 is a perspective view of the cylinder-
retainer;

Fig. 12 is a fragmentary perspective view of a portion of the barrel;

Fig. 13 is an enlarged fragmentary view mainly in side elevation and partly in vertical central-longitudinal section of the portion of the firearm immediately adjacent to the cylinder- and bayonet-mounting fixture and illustrating another form of coupling-means for securing the said fixture in place;

Fig. 14 is a transverse sectional view taken on the line 14—14 of Fig. 13;

Fig. 15 is a fragmentary view in side elevation of the portion of the firearm adjacent the cylinder- and bayonet-mounting fixture and illustrating still another form of coupling-means for securing the said fixture in place; and

Fig. 16 is a transverse sectional view taken on the line 16—16 of Fig. 15.

The particular gas-operated automatic firearm herein chosen for the illustration of the present invention in Figs. 1 to 12 inclusive includes a receiver 15 from which forwardly projects a barrel 16 rigidly secured to the said receiver and provided with the usual axial passage or bore 17 through which the projectile and accompanying burning or burnt gases may pass forwardly. Attached to the barrel 16 by a customary band 18 is a stock 19 which is also secured to the receiver 15 in any approved manner.

As shown in Fig. 1, an action-slide 20 is mounted with capacity for longitudinal reciprocating movement with respect to the receiver 15 and barrel 16 and which at its rear end has pivotally coupled thereto the lower end of a bolt-operating link 21. The bolt-operating link 21 is pivotally
connected at its upper end to the rear end of a breech-bolt 22 movable within the receiver 18. Extending rearwardly from the rear end of the action-slide 20 is a spring-plunger 23 encircled by a breech-bolt-closing spring 24 serving to restore the breech-bolt 22 to its forward or closed position, as shown in Fig. 1, after the said breech-bolt has been thrown rearwardly by the discharge of the firearm in a manner as will hereinafter appear.

As is usual in automatic firearms, the rearward travel of the breech-bolt 22 effects the extraction and ejection of a fired cartridge. Upon its return travel under the urge of the breech-bolt-closing spring 24, the breech-bolt 22 acts to insert a fresh cartridge into the firing-chamber of the firearm preparatory to another cycle of operation under the control of a trigger 25. The said trigger 25 is located within a trigger-guard 26 which forms a rigid feature of a trigger-plate 27 secured in any suitable manner to the underside of the receiver 18.

For the purpose of enabling the user of the firearm to manually retract the breech-bolt 22 an L-shaped link 28 is employed which has its substantially-vertical and relatively-short arm 29 operatively coupled to the forward portion of the action-slide 20 by means of a stud 30. The link 28 has its relatively-long substantially-horizontal arm 31 extending rearwardly substantially perpendicularly to the arm 29 and is guided for movement in a guide-groove 32 formed in the side wall of the receiver 15. The rear end of the horizontal arm 31 of the link 28 is provided with an operating-handle 33 as shown in Fig. 1.

Operatively connected to the forward end of the action-slide 20 by a stud 34 is the rear end 35 of an actuating-rod 36. The actuating-rod 36 forms an integral part of and extends rearwardly from a piston 37 which reciprocates in a manner as will hereinafter appear and which is particularly well shown in Figs. 2, 3 and 8.

Adjacent its forward end the barrel 16 is formed with a smooth cylindrically-contoured portion 38 upon which is mounted a combined cylinder- and bayonet-mounting fixture 39 formed in its upper portion with an axial bore 40 extending through from front to rear thereof and through which the portion 38 of the barrel 16 extends. At its rear end the fixture 39 abuts against the forward face of a radially-extending annular flange 41 forming an integral part of the barrel 16 at the junction of the main part of the said barrel and its portion 38 before referred to. The fixture 39 is securely retained against axial displacement on the portion 38 of the barrel 16 with its rear end abutting against the flange 41, by an annular nut 42. The nut 42 is threaded onto the externally-threaded forward end 43 of the portion 38 and is provided with radial passages 44 by means of which the nut 42 may be threaded in place by a spanner-wrench or the like.

Immediately beneath the axial passage 48 the cylinder- and bayonet-mounting fixture 39 is formed in its lower portion with a cylinder-receiving passage 45 extending in substantial parallelism with the passage 40. The cylinder-receiving passage 45 at its rear end opens into an internally-threaded socket 46 which receives the externally-threaded forward end 47 of a piston-guide tube 48 extending rearwardly from the fixture 39, axially in line with the cylinder-receiving passage 45.

By reference to Fig. 4 in particular it will be noted that the piston-guide tube 48 has a portion of its outer periphery seated in an arcuate coupling-notch 49 formed in the outer periphery of the adjacent portion of the flange 41 of the barrel 16 extending rearwardly of the outer periphery of the piston-guide tube 48 in the coupling-notch 49 it will be readily apparent that the fixture 39 is effectively coupled to the barrel 16 against relative rotation with respect thereto. It may here be noted that the piston-guide tube 48 has axially passing therethrough the operating-rod 38 before referred to, the said guide-tube being adapted upon occasion to receive and guide the piston 37 in a manner as will hereinafter appear.

At its forward end the figure-rectangular passage 45 in the fixture 39 opens into an enlarged socket 50 constituting an enlarged concentric portion of the passage 45 and formed in an extension 51 forwardly projecting from the forward end of the fixture 39. The extension 51 is of substantially U-shaped form in cross section and has the upper edges of its side arms 52—52 concaved to provide clearance for the adjacent portion of the outer periphery of the bayonet nut 42, as is particularly well shown in Fig. 7.

Intermediate its opposite ends, the cylinder-receiving passage 45 in the fixture 39 is intersected by radially-extending passages 53 and 53a located diametrically opposite to each other, the passage 53 being formed in the partition 54 existing between the axial passage 48 and the cylinder-receiving passage 45. The passage 53 is adapted to be in registration with a gas-port 58 leading radially outwardly from the bore 17 of the barrel 16, when the cylinder- and bayonet-mounting fixture is secured in place on the said barrel, as is particularly well shown in Figs. 2 and 5. By reference to the figures just referred to, it will be noted that the passage 53a is in line with and opens outwardly from the cylinder-receiving passage 45 through the outer face of the lower portion of the fixture 39, for the purpose as will hereinafter appear.

Mounted in the cylinder-passage 45 of the fixture 39 is a cylinder 56 which is formed in its inner or rear end with an axial gas-channel 57 receiving with a sliding fit the piston 37 before referred to. Adjacent the forward end of the said gas-channel 57 and forwardly of the piston 37 is a radial port 58 leading outwardly therefrom through the wall of the cylinder 56 in registration with the passage 53 and gas-port 58 when the said cylinder is installed in place in the cylinder-receiving passage 45.

The forward or outer end of the cylinder 56 is formed with a head 59 through which extends diametrically-opposite radial passages 50—50 intersecting an axially-lightening bore 61 formed in the outer portion of the said cylinder. Immediately to the rear of the head 59, the cylinder 56 is formed with an enlarged portion 62 located in the socket 50 in the extension 51 of the fixture 39. The said enlarged portion 62 has its upper portion cut away for substantially 90° on a radius corresponding to the external curvature of the cylinder 56, as shown particularly well in Figs. 7 and 10, to provide a clearance-groove 62a having sloping end walls 62b and 62c. As shown in the figures referred to, the enlarged portion 62 is cut away to provide the necessary clearance for the annular nut 42 which projects into the socket 50 and to permit the cylinder 56 to be rotated or turned substantially 90° with respect to the said
annular nut and the fixture 39, for the purpose later to be described. By having a portion of the enlarged portion 52 of the cylinder 56 cut away to provide the clearance-groove 62a for interfitting with the annular nut 42, the cylinder 56 is effectively prevented from being wrongly installed and fully hereinafter appears. To the rear of the enlarged portion 52, the cylinder 56 is provided on its outer periphery with two pairs of diametrically-opposite radially-offsetting arcuate coupling-lugs 63—63, 64—64. The arcuate coupling-lugs 63—63 are respectively spaced from each other longitudinally of the cylinder 56 so as to form a coupling-groove 65 therebetweent. Similarly, the arcuate coupling-lugs 64—64 are also spaced from each other to provide a coupling-groove 66 between the said coupling-lugs. The coupling-lugs 63—63 and 64—64 have their outer faces curved to fit within the cylindrical socket 59 of the cylinder- and bayonet-mounting fixture 39.

The two pairs of coupling-lugs 63—63 and 64—64 of the cylinder 56 are respectively adapted to be rotatably entered into one of two pairs of coupling-grooves 67—67 and 68—68 formed in the fixture 39 and respectively located diametrically opposite to each other and being a continuation of the curved face of the socket 59. The coupling-grooves 67—67 have interposed between them a rib-like arcuate coupling-lug 69, and similarly the coupling-grooves 68—68 have interposed between them a rib-like arcuate coupling-lug 70, which coupling-lugs are adapted to be respectively entered into the coupling-grooves 65 and 66 of the cylinder 56. The pairs of coupling-grooves 67—67 and 68—68 have their respective opposite ends merged into the cylindrical socket 56. Vertically between the adjacent ends of the respective pairs of coupling-grooves 67—67 and 68—68 are clearance-grooves 11 and 12, as shown in Figs. 6 and 9.

The clearance-grooves 11 and 12 are respectively adapted to provide for the free passage of the respective pairs of coupling-grooves 63—63 and 64—64 when the cylinder 56 is axially moved into or out of position in the cylinder-receiving passage 45. When the cylinder 56 is axially moved into the cylinder-receiving passage 45 to the limit of its inward movement, said end wall 52b of the clearance-groove 62a of the said cylinder in engagement with the annular nut 42, the pairs of coupling-lugs 63—63 and 64—64 will respectively have passed axially through the clearance-grooves 11 and 12, the positioning of the cylinder 56, as just described, will bring the coupling-lugs 63—63 and 64—64 into vertical alignment with the respective coupling-grooves 67—67 and 68—68 in the fixture 39. With the cylinder in this position, it will be understood that the coupling-grooves 65 and 66 thereof are also respectively in vertical alignment with the coupling-lugs 65 and 70 formed in the socket 56 of the cylinder- and bayonet-mounting fixture 39.

With the parts positioned as just above described, the cylinder 56 may be rotated or turned in a counterclockwise direction (as viewed from the rear end of the firearm) through an arc of substantially 90° to enter the respective pairs of coupling-grooves 63—63 and 64—64 into their complementary coupling-grooves 67—67 and 68—68. The arcuate coupling-grooves 65 and 66 of the cylinder 56 will respectively receive the coupling-lugs 65 and 70 projecting inwardly from the socket 56 of the fixture 39. When the coupling-lugs are entered into their complementary coupling-grooves, it will be apparent that the cylinder 56 is prevented from axial displacement with respect to the fixture 39, and hence with respect to the barrel 16, etc.

The turning of the cylinder 56 substantially 90°, as just above described, will bring the sloping end wall 52c of the clearance-groove 62a of the said cylinder into engagement with the annular nut 42, preventing the said cylinder 56 from any further turning movement in the counterclockwise direction referred to. When the turning movement of the cylinder 56 is limited, as just described, the port 58 thereof will be properly registered with the passage 53 of the cylinder- and bayonet-mounting fixture 39 and the gas-port 55 of the barrel 16. By providing the cylinder 56 with the clearance-groove 62a, the said cylinder may be installed in the cylinder-receiving passage 45 of the fixture 39 only in such manner as to permit the cylinder 56 to be correctly turned to bring its port 58 into registration with the passage 53 and gas-port 55 previously described. The provision of the clearance-groove 62a in the cylinder 56 thus effectively prevents the said cylinder from being incorrectly installed in the cylinder-receiving passage 45 of the fixture 39.

Immediately to the rear of the head 55, the enlarged portion 52 of the cylinder 56 is formed with diametrically-opposite radially-extending passages 72—73 adapted, when the said cylinder is installed in place in the cylinder-receiving passage 45, to register with two diametrically-opposite radial passages 74—74 formed in the side arms 52—52 of the extension 51 of the fixture 39. The passages 72—73 and 74—74, when in registration with each other, receive a cylinder-retaining pin 75 which extends transversely of the extension 51 of the cylinder- and bayonet-mounting fixture 39, as shown in Figs. 3 and 7, when the cylinder is properly positioned in the said fixture. As will be apparent, the pin 75 serves to prevent the turning of the cylinder 56 when the said pin is assembled in place.

The cylinder-retaining pin 75 has rigidly secured to one end thereof a lever 76 which is normally, under inherent spring tension, in engagement with the adjacent side face of the cylinder- and bayonet-mounting fixture 39, as shown in Fig. 3. The lever 76 is formed at its outer end with an inwardly-extending detent-finger 77 normally seated in a conical detent-recess 78 formed in the side face of the fixture 39 as is clearly shown in Fig. 3, and which serves to prevent the lever 76 from being unintentionally rotatably displaced from the position in which it is shown by full lines in Fig. 1 to that in which it is shown by broken lines in the same figure. The forward end 79 of the lever 78 is normally seated in an arcuate retaining-slot 80 formed in the rear face of a retaining-lug 81 projecting outwards from the right-hand face of the head 55 of the cylinder 56. The arcuate retaining-slot 80 is swung with the axis of the pin 75 as a center to enable the forward end 79 of the lever 78 to be turned into and out of the said retaining-slot 80.

As will be apparent, the retaining-slot 80 serves to prevent the axial displacement of the pin 75 but allows the said pin to be axially bodily removed when the lever 76 is swung down into the position in which it is shown by broken lines in Fig. 1. It will be understood that the detent-finger 77 is first removed from the detent-recess 78 by the point of a cartridge, or by other means, to allow the lever 76 together with the pin 75 to
be turned about the axis of the said pin to there- 
by remove its forward end 79 from the retaining-
slot 80 permitting the subsequent axial with-
drawal of the pin 78.

With the pin 78 removed, the cylinder 56 may 
be easily and readily turned by passing a car-
ridge-casing such as 82 (shown by broken lines 
in Fig. 3) through the radial passages 60—65 in 
the head 59 of the said cylinder. By means of 
the cartridge-casing 82, the said cylinder may be 
readily turned to remove its coupling-lugs from 
their respective coupling-grooves in the socket 
55 of the cylinder- and bayonet-mounting fixture 
38, to thus bring the said coupling-lugs into hori-
zontal alignment with the clearance-grooves 71 
and 72 thereof. With the coupling-lugs in hori-
zontal alignment with the clearance-grooves as 
just above described, the cylinder 56 may be 
axially withdrawn forwardly from the cylinder-
receiving passage 45 and the socket 59 for in-
pection, cleaning, replacement, etc.

Returning to the piston 37, it will be noted that 
the said piston is formed at its rear end with four 
(or more) radially-extending guide-ribs 83 and 
with a corresponding number of notches 84 
separating the respective ribs. The ribs 83 are 
adapted to freely slide the piston guide-
tube 48 and serve to hold the piston 37 axially in 
place in the said guide-tube 48 when the piston 
37 has been moved rearwardly out of the gas-
chamber 87 and into the said guide-tube in a manner as will hereinafter appear.

The combined cylinder- and bayonet-mounting 
fixture 38 is formed on its under face adjacent the 
forward end thereof, with a depending T-shaped 
bayonet-coupling lug 85 which serves to securely 
couple the outer end of the handle of a bayonet 
(not shown) to the firearm structure in any cus-
tomary manner requiring no description herein.

Adjacent its rear end, the cylinder- and 
bayonet-mounting fixture 38 is also formed on its 
under face with two depending ears 86—87 later-
lated spaced from each other to receive between 
them the upstanding coupling-ear 87 of a stack-
ing-swivel 88, which latter may be of any con-
ventional form. To pivotally connect the stack-
ing-swivel 88 to the ears 86—87, the said ears and 
the coupling-ear 87 of the stacking-swivel 88 have 
passing therethrough a pivot-screw 89, which 
latter is threaded into the juncture of the coupling-ear 
87 and the socket 38 as shown by the fixture 38. The stacking-
swivel 88 requires no detailed description herein, 
as it may be of any conventional form and serves, 
in the manner customary to such stackings-
swivels, to allow the stacking of firearms.

For brevity of description, it may be stated 
that the breech-bolt 22 and associated parts 
which are actuated by the action-slide 20 are to 
be considered as constituting a so-called "fire-
arm-action," in accordance with well understood 
terminology in the art.

For the purpose of making clear the operation 
of the firearm herein chosen for illustration, let 
it be assumed that the piston 37 is occupying 
the position in which it is shown by full lines 
in Figs. 2 and 3 of the accompanying drawings, 
under the urge of the breech-bolt-closing spring 
24.

Now when the trigger 25 is operated in the 
usual manner of firearms, a cartridge will be 
discharged, with the result that the projectile 
will be propelled forwardly through the bore 17 
of the barrel 16 under the force of the burning 
powder charge. As the projectile passes beyond 
the inner end of the gas-port 55, the gas-under-
pressure back of the said projectile will escape 
radially outwardly through the said gas-port 55, 
passage 53, and port 58 into the forward end of 
the gas-chamber 87. The entry of gas into 
the gas-chamber 87 as just described will prob-
elably expel the piston 37 rearwardly with the result 
that the actuating-rod 36, breech-bolt 22 and 
associated parts will all be moved rearwardly 
against the tension of the spring 24. In this 
manner, the casing of the just-fired cartridge 
will be ejected and the firing mechanism will be 
cocked, preparatory to the return movement of 
the breech-bolt 22, action-slide 20 and associated 
parts to their former position, as illustrated in 
Figs. 2 and 3.

As is usual in automatic firearms, the breech-
bolt 22 after having been retired in the manner 
above described, will move forwardly under 
the urge of the breech-bolt-closing spring 24 and 
will insert a fresh cartridge into the cartridge-
chamber in the rear end of the barrel 16, 
preparatory to again discharging the firearm by 
means of the actuation of the trigger 25.

As the piston 37 moves rearwardly when the 
firearm is discharged, the said piston will pass 
rearwardly out of the gas-chamber 87 and 
beyond the rear edge of the cylinder 56. When 
the piston 37 has been completely rearwardly 
moved out of the gas-chamber 87 into the guide-
tube 48, the said piston and the forward end 
of the rod 20 will be guided by the 
said guide-tube during the course of its rearward 
travel. When the forward face of the piston 
37 has cleared the rear edge of the cylinder 56 
the gases contained in the gas-chamber will be 
free to escape rearwardly into the guide-tube 
48 and through the notches 84 of the said piston 
37, relieving the rearward pressure forwardly 
thereof.

When the piston 37 is being guided by the 
guide-tube 48, it will be understood that the 
ribs 83 thereof serve to position the said piston 
in place in the said guide-tube to insure that 
the said piston is guided concentrically into the 
gas-chamber 87 upon the forward return move-
ment thereof, preparatory to another cycle of 
operation.

Instead of employing the coupling-means 
shown in the structure of Figs. 1 to 12 inclusive, 
to couple the said gun-barrel to the 
above-mentioned fixture and barrel together, a structure such as that 
illustrated in Figs. 13 and 14 may be employed.

In the figures referred to, many features of the 
structure are, in the main, the same as those 
illustrated in the preceding figures, and previous-
ly described and like parts will bear similar refer-
ence characters, with the addition of the refer-
ence character "a."

To couple the cylinder- and bayonet-mounting 
fixture 38, illustrated in Figs. 13 and 14, to the 
barrel 16a against relative rotation with respect 
thereto, the said fixture has its axial passage 
49a provided in its rear portion with a longi-
tudinal coupling-groove 91. The coupling-groove 
91 extends outwardly through the rear end of 
the fixture 90 and receives a key 92 fitting also in 
alongitudinal coupling-groove 92 formed in 
the outer periphery of the barrel 16a imme-
diately forwardly of the radial flange 41a of 
the said barrel 16a. As will be apparent, the 
key 92 that the projectile exits forwardly from 
the bayonet-mounting fixture 90 from turning or 
rotating on the barrel 16a when the said fixture 
is secured in place with its rear end seated 
against the forward face of the flange 41a of
the said barrel 16a by the annular nut 42a, as previously described.

In Figs. 15 and 16 still another form of coupling-means is illustrated for coupling the barrel-receiving and bayonet-mounting fixture against relative rotation with respect to the barrel of the firearm. In the figures referred to, many of the features correspond to those shown in Figs. 1 to 12 inclusive, and where such features appear in Figs. 15 and 16 and are not otherwise designated, they bear the same reference character plus the reference character "b."

In the construction shown in Figs. 15 and 16, a cylinder- and bayonet-mounting fixture 94 is employed and is provided on its rear end with two rearward-projecting coupling-lugs 95-95 located diametrically opposite each other on opposite sides of the axial passage 16b of the said fixture. The coupling-lugs 96-96 of the cylinder- and bayonet-mounting fixture 94 are adapted to be entered into coupling-notches 96-96 provided diametrically opposite each other in the periphery of the flange 16a of the barrel 16b of the firearm. The coupling-notches 96-96 respectively receive the coupling-lugs 95-95 of the fixture 94 when the latter is mounted in place on the barrel 16b, with its rear end abutting against the forward face of the flange 16a, in which position the said fixture 94 is securely retained by the annular nut 42b, all as has been more clearly set forth in the description of Figs. 1 to 12 inclusive. It will thus be seen that the cylinder- and bayonet-mounting fixture 94 is effectively held against rotation with respect to the barrel 16b by employing means such as the coupling-lugs 95-95 and their complementary coupling-notches 96-96.

By means of a construction such as is herein shown and described, it is possible to locate the gas-port leading radially from the bore of the barrel, closely adjacent the forward end of the barrel, without requiring the undue lengthening of the structure in order to provide for the mounting of a bayonet. Furthermore, a fixture such as the fixture 95 serves not only to provide a gas-cylinder of rugged construction and a sturdy bayonet-support if desired, but also provides a rigid fixture forwardly of the stock to shield the same and to which a stacking-swivel may be attached.

By means of the construction herein described and as shown in the accompanying drawings, it will be seen that the cylinder may be readily removed and that by the removal of the said cylinder, the gas-port 55 and passage 53 may be readily cleaned by the use of any suitable object being passed upwardly through the passage 53a formed axially in the therewith in the lower wall of the cylinder-receiving passage 45 and that the passage 53a is normally effectively closed off by the cylinder 55.

It will also be seen that the cylinder- and bayonet-mounting fixture is accurately positioned with respect to the port 55 and that the said fixture is effectively prevented against turning with respect to the barrel 16. The cylinder- and bayonet-mounting fixture thus serves to provide a sturdy-cylinder-receiving fixture of the cylinder and to provide for mounting the customary stacking-swivel and T-shaped bayonet coupling-lugs, resulting in a compact structure at the forward end of the firearm.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

We claim:

1. A gas-operated automatic firearm-construction including in combination: a barrel having an axial bore and a gas-port leading laterally therefrom; a cylinder-mounting fixture having a barrel-receiving passage extending therethrough from front to rear and receiving the muzzle portion of the said barrel, a cylinder-receiving passage extending from front to rear in substantial parallelism with the said barrel-receiving passage, and a gas-port extending through a wall of the said cylinder-mounting fixture into communication with the gas-port of the said barrel; means for holding the said cylinder-mounting fixture against both rotary and axial displacement with respect to the said barrel; a tubular gas-cylinder removably and replaceably installed in the cylinder-receiving passage of the said cylinder-mounting fixture and having a radial gas-port in communication with the gas-port in the wall of the cylinder-receiving passage of the said fixture, the said tubular gas-cylinder having a longitudinally clearance-groove flanked at either side by an end wall, the said clearance-groove receiving the cylinder-limiting means of the said barrel and the end walls of the said clearance-groove being positioned to engage with the cylinder-limiting means of the said barrel to limit the rotational movement of the said tubular gas-cylinder in the cylinder-receiving passage of the said cylinder-mounting fixture; and locking-means for releasably coupling the said tubular gas-cylinder to the said cylinder-mounting fixture against axial displacement with respect thereto and constructed and arranged to be rendered effective and ineffective respectively by reverse turning movements of the said gas-cylinder with respect to the said cylinder-mounting fixture.

2. A gas-operated automatic firearm-construction including in combination: a barrel having an axial bore and a gas-port leading laterally therefrom; a cylinder-mounting fixture having a barrel-receiving passage extending therethrough from front to rear and receiving the muzzle portion of the said barrel, a cylinder-receiving passage extending from front to rear in substantial parallelism with the said barrel-receiving passage, and a gas-port extending through a wall of the said cylinder-mounting fixture into communication with the gas-port of the said barrel; a positioning-nut threaded upon the said barrel and holding the said cylinder-mounting fixture against forward axial displacement with respect thereto; means for holding the said cylinder-mounting fixture against rotary displacement with respect to the said barrel; a tubular gas-cylinder removably and replaceably installed in the cylinder-receiving passage of the said cylinder-mounting fixture and having a radial gas-port in communication with the gas-port in the wall of the cylinder-receiving passage of the said fixture, the said tubular gas-cylinder having on its periphery a longitudinal clearance-groove flanked at either side by an end wall, the said clearance-groove receiving the locating-nut on the said barrel and the clearance-groove being positioned to engage with...
the said locating-nut of the said barrel to limit the rotational movement of the said gas-cylinder in the cylinder-receiving passage of the said fixture; and locking-means for releasably coupling the said tubular gas-cylinder to the said cylinder-mounting fixture against axial displacement with respect thereto and constructed and arranged to be rendered effective and ineffective respectively by reverse turning movements of the said gas-cylinder with respect to the said cylinder-mounting fixture.

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