Oct. 10, 1961 J. H. JOHNSON 3,003,400

TAKE-DOWN ASSEMBLY FOR A FIREARM WITH A GAS PISTON

Filed Jan. 21, 1960 2 Sheets-Sheet 1

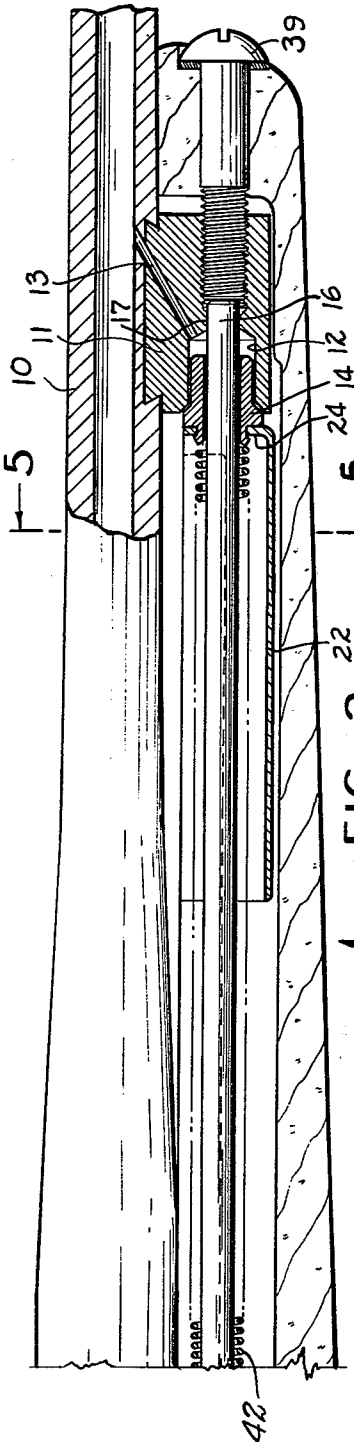

FIG - 2

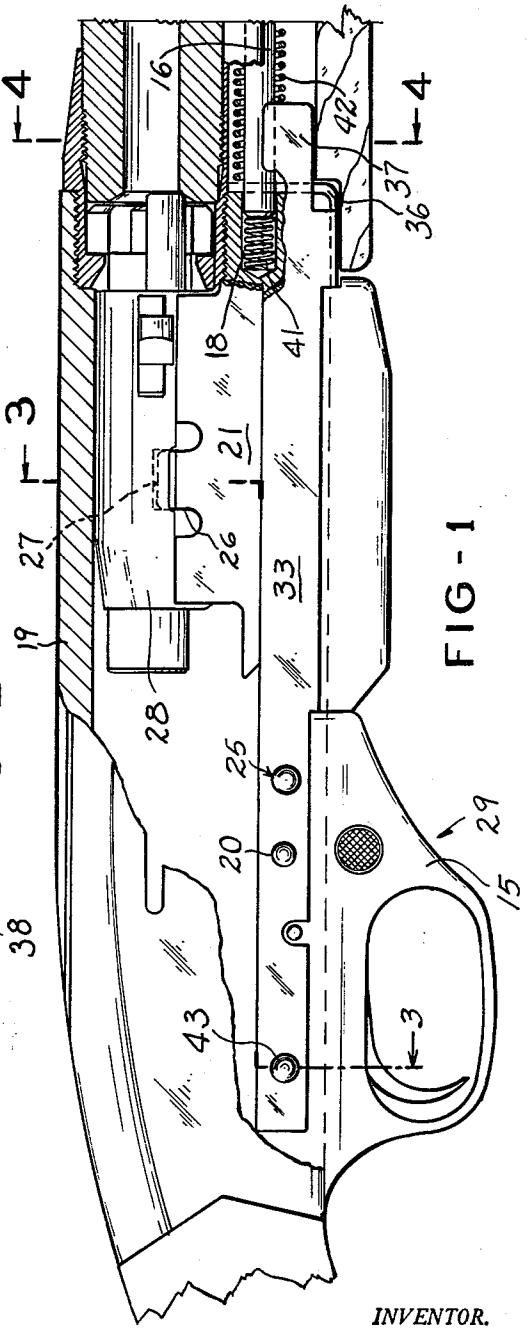

FIG - 1

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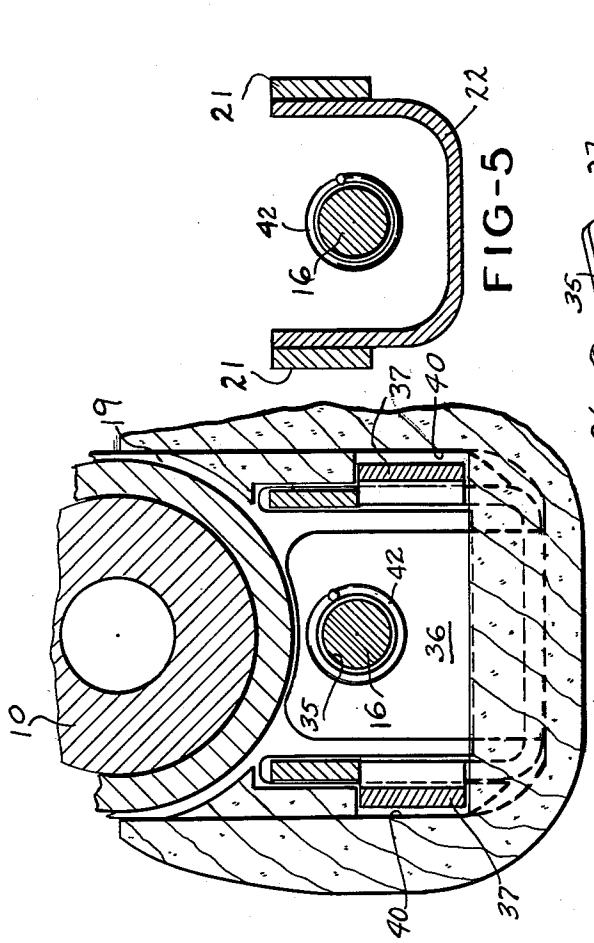

FIG-5

FIG-4

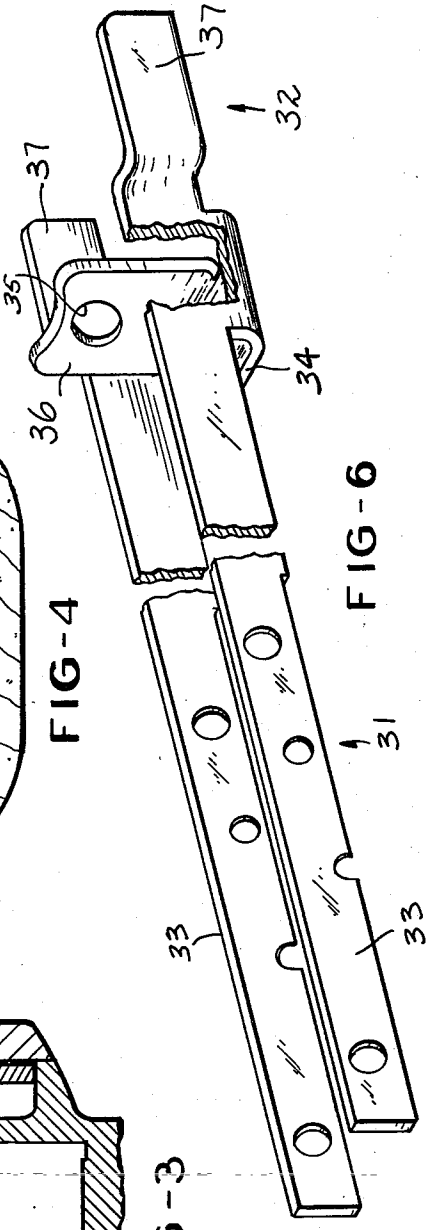

FIG-6

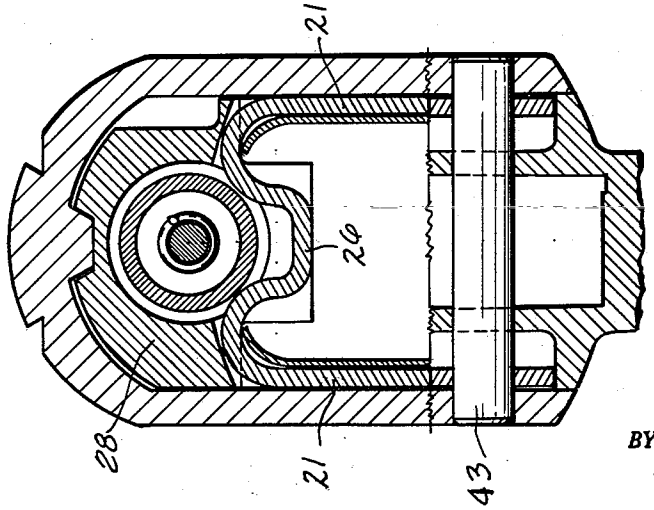

FIG-3

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3,003,400

TAKE-DOWN ASSEMBLY FOR A FIREARM WITH A GAS PISTON

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6 Claims. (Cl. 89—191)

The present invention relates to firearms and in particular to a novel assembly which facilitates take-down.

The invention is also related to a novel method for assembling and taking down a firearm.

As is traditional in the art, the terminology "take-down" is intended to refer to disassembly including the method of disassembly for purposes of cleaning, oiling and repair.

Among the features of the invention is the provision of a firearm having a forearm wherein the forearm is rigidly connected to the barrel only at the forward end thereby permitting the after or rear end of the forearm to "come and go" or seat itself axially as necessary and as conditions of atmosphere and climate affect expansion and contraction of metallic and wooden parts.

Another feature of the invention is the provision of a firearm having a simple take-down assembly in which there is a minimum of close tolerance piece parts.

A further feature of the invention is the provision of a take-down assembly in a gas operated firearm in which a centrally disposed guide rod is utilized to carry a working piston and track means for the bolt where the track means are formed with connector means for receiving and retaining the rear end of the forearm.

A further feature of the invention is the provision of a firearm take-down assembly wherein there is unusual cooperation between the trigger assembly, bolt, working piston, piston cylinder, and the forearm.

A firearm including certain principles of the present invention and embracing the special take-down assembly and take-down method may comprise a forearm, a barrel, a receiver having a bore, a trigger assembly secured to the receiver and having a track means for slidably supporting a bolt, a bracket carried by the barrel apertured to define a cylinder and to receive slidably a guide rod, a working piston within the cylinder and carried by the rod having operating means connected to the bolt for actuating the bolt along the track means when the piston is driven, connector means formed integral with the track means and supported by the guide rod for engaging and retaining one end of the forearm, and screw means engaging the bracket and the forearm for rigidly securing the opposite end of the forearm to the barrel.

Other features and advantages of the present invention will become more apparent from the succeeding specification when read in conjunction with the appended drawings, in which:

FIG. 1 is an elevational view of a gas operated firearm embracing the principles of the present invention with certain portions broken away for clarity;

FIG. 2 is a continuation of the right end of the representation of FIG. 1;

FIG. 3 is a vertical section of the drawing of FIG. 1 taken along the zig zag line 3—3;

FIG. 4 is a further section of FIG. 1 taken in the plane of the line 4—4;

FIG. 5 is a section of FIG. 2 in the plane of the line 5—5, and,

FIG. 6 is a perspective view of the track means and the connector means both of which are integral parts of the trigger assembly of FIG. 1.

Referring now in detail to the drawings, there is shown a barrel 10 having a depending bracket 11 formed with a first bore 12 defining a cylinder or a compression chamber. The bore 12 communicates with the interior of the barrel 10 by means of the passageway 13 in well known fashion whereby gas developed in the barrel may flow into the compression chamber to introduce kinetic energy to a piston 14 slidably carried upon a movably mounted guide rod 16. One end of the rod 16 is slidably received in a second bore 17 formed in the bracket; the other end is slidably received in a bore 18 formed in a receiver 19.

The working piston 14 operates a pair of bolt actuating arms 21—21 connected to the piston at their forward end by means of a U-shaped strap 22 having a central tongue 24. The opposite or rear ends of the operating arms 21—21 engage the bolt wherein a generally saddle-shaped bridge element 26 formed integral with the arms is received in a cut out portion 27 of a bolt means 28 as is most apparent in FIG. 1.

Note that the trigger assembly, indicated generally by the reference numeral 29, includes a track means 31 (FIG. 6) and a connector means 32 comprising a pair of spaced, parallel rails 33—33 joined by a U-shaped bridge 34 and having an upstanding ear 36 apertured at 35 and a pair of forwardly projecting fingers 37—37. The rails 33—33 are connected to a trigger guard 15 by means of a rivet 20.

As is apparent in FIGS. 1 and 2, a forearm, indicated generally at 38, cooperates with the barrel and the receiver to surround and enclose the guide rod 16, the piston and the bolt operating arms 21—21.

Note that the after end of the forearm slidably receives the projecting fingers 37—37 of the connector means 32 and a portion of the bridge 34 so that, in effect, the rear end of the forearm does not abut the receiver but is free to "float," axially, as normal expansion and contraction occurs.

It is further noted that the rear end of the forearm is provided with a pair of horizontally disposed, spaced undercut slots 40—40 to receive the fingers 37—37 thereby precluding the after portion of the forearm from dropping downwardly away from the receiver after assembly.

In contrast, the forward end of the forearm is rigidly connected to the firearm through the bracket 11 wherein a screw means characterized by a screw 39 threadedly engages the bracket and passes through an aperture formed in the forearm to fix this end of the forearm rigidly in abutment with the bracket.

To avoid close tolerance dimensions governing the length of the guide rod 16, the bore 18 is partially filled with a coil spring 41 which constantly urges the rod to the right into abutment with the screw 39. In this arrangement there is no danger that the rod 16 will bottom and therefore interfere before the screw 39 brings the forward end of the forearm into rigid abutment with the bracket 11.

In operation, introduction of gas pressure into the pressure cavity 12 introduces kinetic energy to the working piston 14 operative through the operating arms 21 to drive the bolt rearwardly along the track means or rails 33—33 of the trigger assembly. A return spring 42 operates to return the working piston to its normal position.

To take down the firearm, it is simply necessary to remove the screw 39 whereupon the forearm is free to move to the right as viewed in FIGS. 1 and 2 off the bracket 11 while the rear portion of the forearm slides off the fingers 37—37 and off the bridge 34 quickly exposing the interior of the action.

Since the rod 16 is slidably disposed, it is readily withdrawn, releasing the springs 41 and 42.

Thereafter pin 43 is removed releasing the trigger assembly including the track means 31 and the connector means 32 from the receiver 19. A pin 25 carried by the rails 33—33 provides a pivotal mounting for a hammer (not shown). The bolt means drops downwardly out of the receiver while the piston assembly including the operating arms 21—21 is moved slightly to the left as viewed in FIG. 2 to withdraw it from the cylinder and thereafter drops downward freely.

It is anticipated that a variety of modifications and design changes may be devised in the disclosed embodiment of the invention without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination in a firearm a barrel, a receiver, a guide rod movably supported by the barrel and the receiver, a bolt actuating piston carried by the rod, a trigger assembly carried by the receiver and the rod and a forearm cooperating with the barrel to enclose the piston and the rod, said forearm being carried by the barrel and the trigger assembly.

2. In a firearm the combination of a forearm, a guide rod, a bolt, a barrel, a receiver having a bore, a trigger assembly including track means for slidably supporting the bolt and a connector means for supporting the forearm, a bracket carried by the barrel apertured to receive slidably the guide rod, one end of said rod being received in said bore, a working piston within the bracket carried by said guide rod and having operating means connected to the bolt for actuating the bolt along the track means when the piston is driven, said connector means being formed integral with the track means and supported by the guide rod for engaging and retaining one end of the forearm, and screw means engaging the bracket and the forearm for rigidly securing the opposite end of the forearm to the barrel.

3. A take-down assembly for a gas operated firearm comprising a barrel, a guide rod, a trigger assembly, a receiver having a bore, a bracket carried by the barrel apertured to slidably receive the guide rod, a piston carried by one end of the guide rod, the opposite end of the guide rod being received in the bore, said piston cooperating with said bracket to define a compression chamber, resilient means in the bore and in series with the guide rod for urging the guide rod toward said bracket, screw means engageable with said bracket and said one end of the guide rod operative to fasten a forearm to the barrel rigidly, said screw means being further operative to drive said guide rod in a direction which tends to compress the spring to preclude jamming, the opposite end of said guide rod being operative to carry one end of the trigger assembly, said trigger assembly terminating in a pair of fingers operative to project, in telescoping fashion, into the rear of the forearm whereby the forearm fully encloses the guide rod.

4. In a firearm of the class having a guide rod, a barrel, a receiver and a trigger assembly, the combination therewith of means for movably suspending the guide rod from the receiver and from the barrel, a bolt actuating piston carried by the rod, means for securing the trigger assembly to the receiver and to the rod and a forearm fastened to the barrel and to the trigger assembly for enclosing the rod.

5. The firearm of claim 4 wherein the means for suspending the rod is a bracket having a cylindrical bore which communicates with the interior of the barrel.

6. The firearm of claim 4 wherein the trigger assembly includes track means for guiding a bolt and connector means for receiving one end of the forearm telescopically.

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