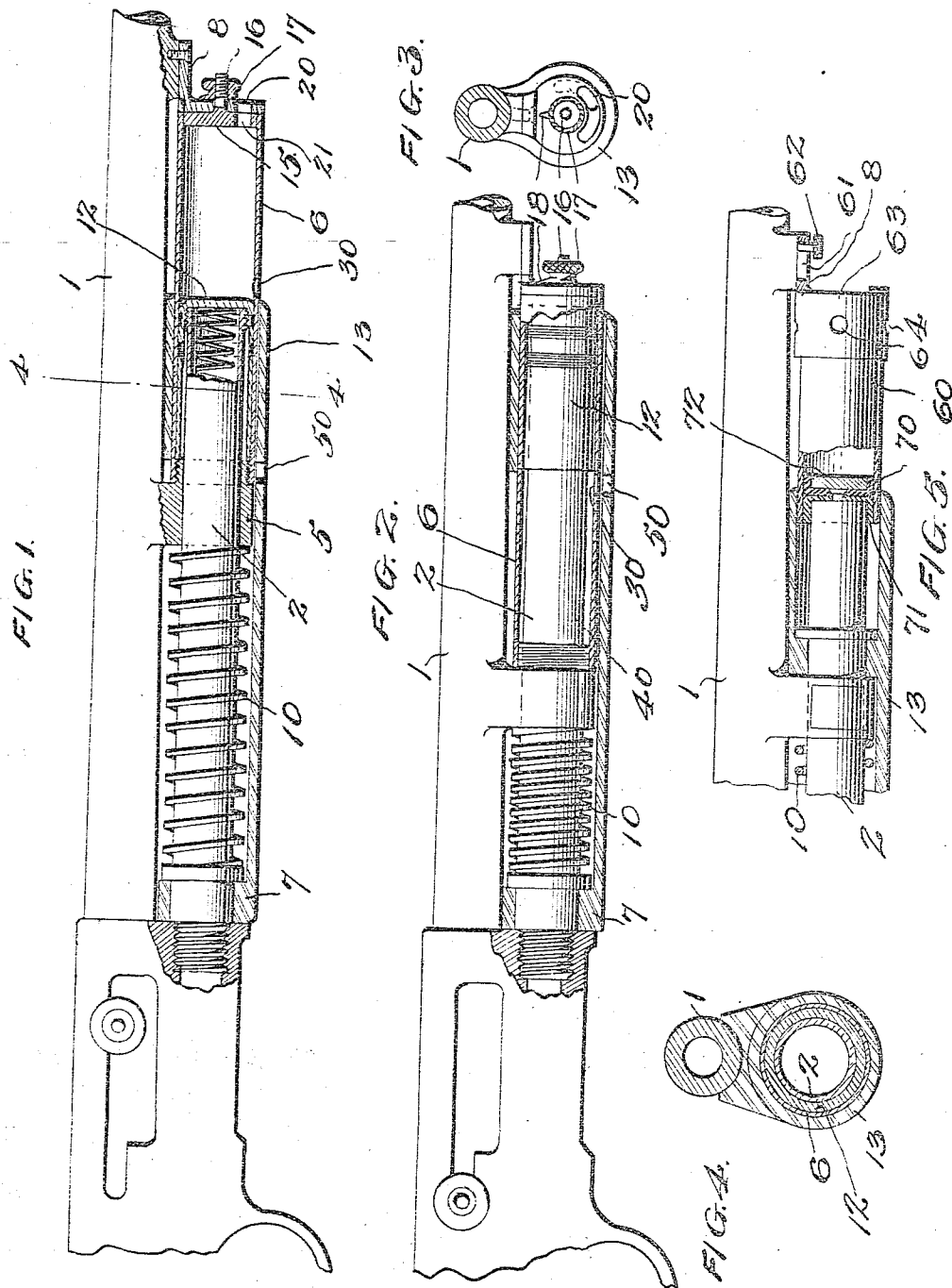


E. GRAY.
 RECOIL MECHANISM.
 APPLICATION FILED MAY 6, 1912.

1,042,551.

Patented Oct. 29, 1912.



WITNESSES

C. H. Davis
 Jos. H. Brown

INVENTOR
 Ernest Gray
 By *Rock & P. Smith*
 Attorneys

UNITED STATES PATENT OFFICE.

ERNEST GRAY, OF OGDEN, UTAH.

RECOIL MECHANISM.

1,042,551.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed May 6, 1912. Serial No. 695,426.

To all whom it may concern:

Be it known that I, ERNEST GRAY, a citizen of the United States, residing at Ogden, Utah, have invented new and useful Improvements in Recoil Mechanism, of which the following is a specification.

My invention relates to recoil checking mechanism particularly adapted for automatic small arms.

The invention is here exemplified as applying to an automatic rifle or gun.

One of the objects of the invention is to provide an efficient air check to cooperate with the recoil spring.

Another object is to make the pneumatic check action adjustable.

A further object is to provide means for checking the return movement of the barrel.

The characteristics and advantages of the invention are further pointed out so far as is necessary in connection with a detailed description of the accompanying drawing.

Figure 1 is a side view, partly in longitudinal section, of a gun embodying the invention. Fig. 2 is a similar view showing the barrel in rearward or recoil position. Fig. 3 is a front end view. Fig. 4 is a section on the line 4-4 of Fig. 1. Fig. 5 is a sectional view of a modification.

Reference character 1 designates the reciprocating barrel and 2 the tubular magazine, fixed at its rear end. The barrel carries a lug 5 embracing the magazine, and to this the recoil cylinder 6 is screwed. The cylinder slides about the magazine and within the tubular fore-end or forearm 7. At its forward end, desirably, the cylinder is braced by means of a lug 8 secured to the barrel. The recoil spring 10 is located about the magazine and acts against lug 5. To provide a bearing for the cylinder, the magazine cap 12 constitutes also a piston having rings 13 or other suitable packing engaging the cylinder. The magazine cap is screwed down upon the front end of the magazine as shown.

Within the front end of the cylinder and resting against lug 8 is a revoluble disk 15 having a stem 16 extending outward through a hole in the lug and provided with a knurled nut 17 and pointer 18 which may point to calibrations on the lug. The lug is provided with an arc-shaped port 20, and the disk is also provided with a similar port 21. By rotating the thumb-nut, the

disk is turned and the openings 20 and 21 are brought more or less into or out of registry to vary the effective size of the exhaust from the cylinder and this is done according to the calibrations on the lug in accordance with the power of ammunition to be used. The cylinder is usually provided with a relief opening or port 30 which may be located just forward of the magazine cap when the barrel is in forward position, as shown in Fig. 1.

When the barrel recoils upon firing, the cylinder slides back over its piston 12. As soon as port 30 passes the end of the piston the body of air is compressed in the forward end of the cylinder and this escaping more or less slowly through the ports 20, 21, brings the barrel properly to rest without shock or jar. This effect may be assisted by the suction or vacuum created in the space 40 between the lug 5 and the rear end of the magazine cap or piston, as the barrel approaches its rearward position. As soon as the port 30 passes the rearward end of the piston this vacuum may be more or less satisfied by passage of air through the port and when desired this may be facilitated by a hole or port 50 through the forearm. The recoil spring 10 now returns the barrel to forward position and the final movement of the barrel is cushioned and properly checked by suction in the front end of the cylinder and by air compressed in the chamber 40 as soon as port 30 passes forward of the rear end of the piston.

Fig. 5 shows a construction in which the check cylinder 60 is secured to the barrel only at its forward end—in this case adjustably, by means of a slotted lug 61 and screw 62. The port adjustment for the cylinder in this case is by means of a revoluble sleeve 63 with ports 64 registering with suitable ports in the cylinder. The packing in this case consists of cupped leather washers 70, 71, secured to the front end of the magazine cap by a flat headed screw 72.

I claim:

1. In a small arm, the recoil mechanism comprising a barrel, a cylinder fixed thereto, a recoil spring and a magazine rigidly fixed with respect to the stock and constituting a piston within the cylinder.

2. In a small arm, the combination of a barrel, a recoil spring, a cylinder secured to the barrel, a fixed magazine within the

cylinder and constituting a piston therein, and an adjustable escape port in the cylinder.

3. In fire-arms, the combination of a fixed
5 magazine, a cap therefor constituting a piston, a reciprocating barrel, a recoil spring, a cylinder secured to the barrel and cooperating with the piston, a recoil check
10 space being formed within the cylinder forward of the piston, and a return check space being formed within the cylinder to the rear of the piston.

4. In fire-arms, the combination of a fixed
15 magazine, a cap therefor constituting a piston, a reciprocating barrel, a recoil spring, a cylinder secured to the barrel and cooperating with the piston, a recoil check
20 space being formed within the cylinder forward of the piston, a return check space being formed within the cylinder to the rear of the piston, and adjustable means for

regulating the escape of air from said recoil space.

5. In fire-arms, the combination of a magazine, a barrel, a recoil spring, a cylinder 25 secured to the barrel, and a removable magazine cap constituting a piston for the cylinder.

6. In fire-arms, the combination of a fixed magazine, a barrel, a lug thereon embracing 30 the magazine, a recoil spring acting against the lug, a cylinder secured to the lug and a removable magazine cap constituting a piston, a recoil chamber being afforded in the cylinder forward of the piston, and 35 adjustable means for regulating the escape of air from said cylinder.

ERNEST GRAY.

Witnesses:

A. S. MESERVE,
H. J. MOLLERUP.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."