

Aug. 17, 1926.

J. L. MALLORY

1,596,057

GAS RIFLE

Filed August 4, 1925

3 Sheets-Sheet 1

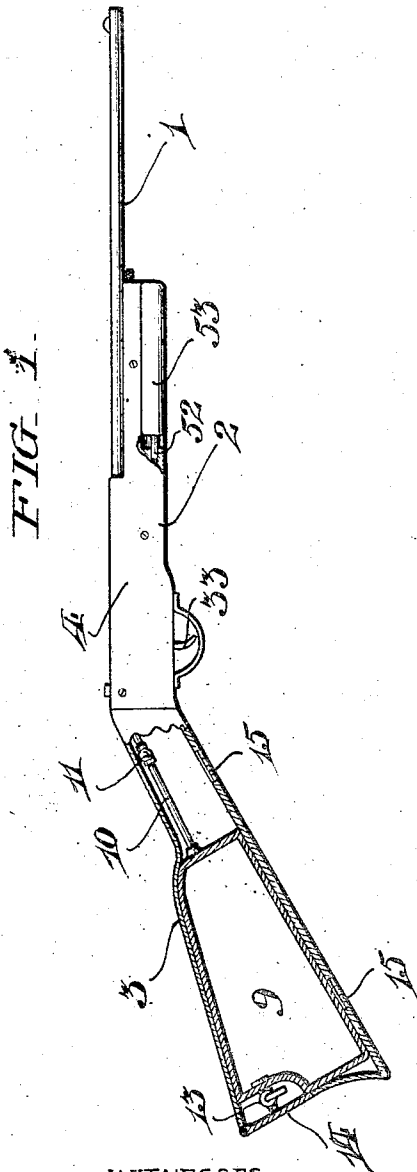


FIG. 3.

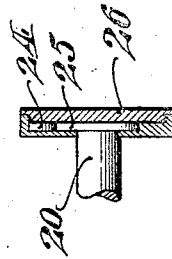


FIG. 2.

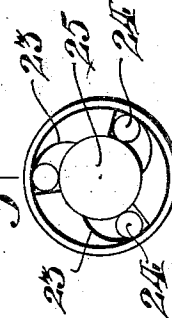
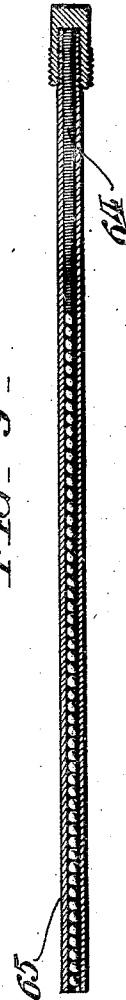


FIG. 9.



WITNESSES:

Alfred E. Ischinger,
George A. Gross.

INVENTOR

Junius L. Mallory,

BY

Joshua P. H. H. H.
ATTORNEY

Aug. 17, 1926.

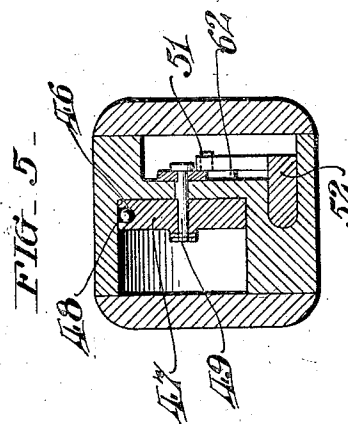
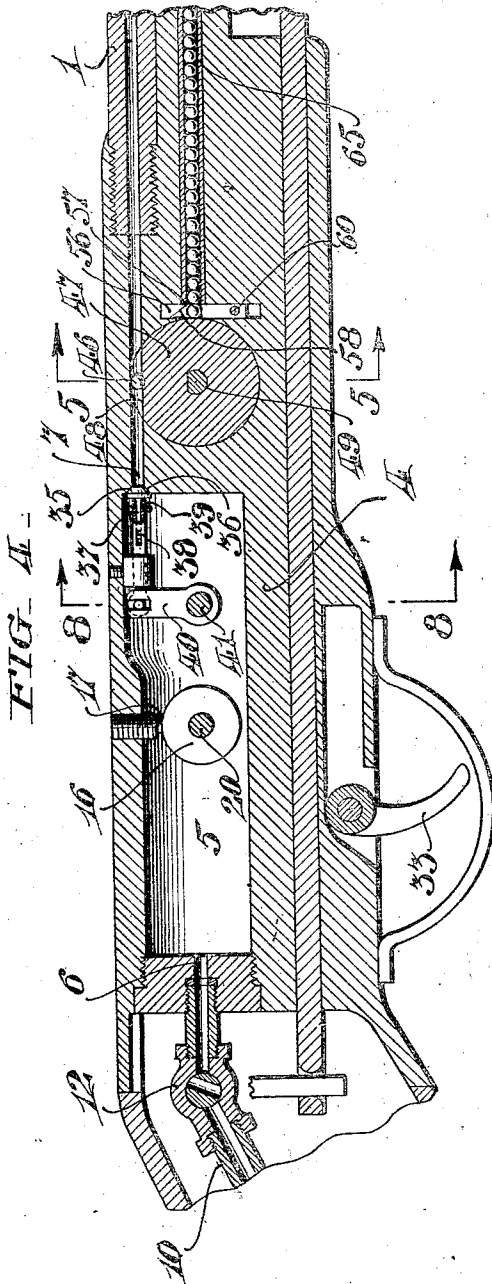
J. L. MALLORY

1,596,057

GAS RIFLE

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3 Sheets-Sheet 2



WITNESSES:

Alfred E. Tschinger
George A. Gross

INVENTOR

Junius L. Mallory

BY

Joshua R. H. Kottke
ATTORNEY

Aug. 17, 1926.

J. L. MALLORY

1,596,057

GAS RIFLE

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FIG. 6.

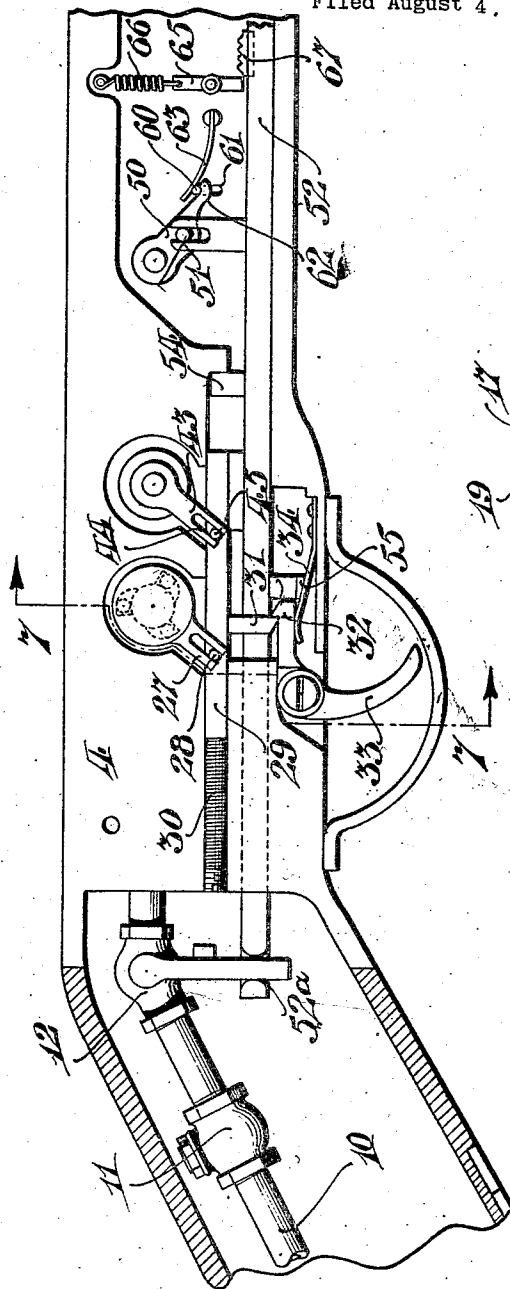


FIG. 7.

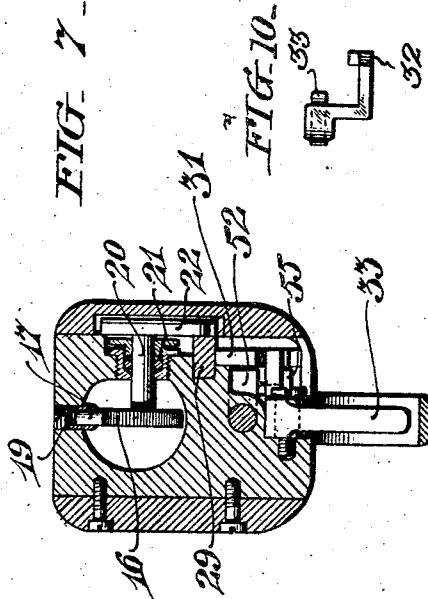
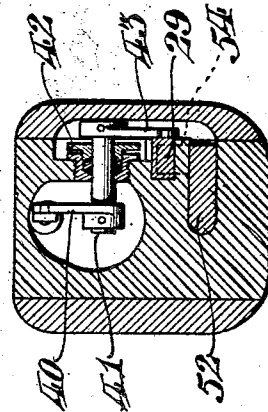


FIG. 8.



WITNESSES:

Alfred E. Drexler
George A. Gross

INVENTOR

Jarvis L. Mallory,
BY
Joshua R. H. H. H.
ATTORNEY

UNITED STATES PATENT OFFICE.

JUNIUS L. MALLORY, OF BOSTON, MASSACHUSETTS.

GAS RIFLE.

Application filed August 4, 1925. Serial No. 48,042.

My invention relates to gas rifles and its objects are to provide a rifle, primarily intended for use as a toy, in which sparks produced by friction explode the gas; in which the spark producing mechanism is locked during the gas feeding action, and which is provided with reloading mechanism.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which—

Figure 1 is a side elevation partly in section of a rifle made in accordance with my invention,

Figure 2 a face view of an element forming a part of my invention showing the interior ratchet construction,

Figure 3 a section on line 3—3 of Figure 2,

Figure 4 a fragmentary central section through the rifle shown in Figure 1,

Figure 5 is a section on line 5—5 of Figure 4,

Figure 6 a fragmentary side view partly in section of the rifle shown in Figure 1,

Figure 7 a section on line 7—7 of Figure 6,

Figure 8 a section on line 8—8 of Figure 4,

Figure 9 a central section through projectile feeding elements forming a part of my invention, and

Figure 10 a detail plan view of the trigger which forms a part of my invention.

Referring to the drawings, 1 indicates a barrel, 2 a breech, and 3 the butt of the rifle. The breech has a body 4 provided with a combustion chamber 5 which has a gas inlet 6 and a gas outlet 7. Barrel 1 is threaded to the body so that its bore is aligned with outlet 7. Gas is fed to the chamber from a tank 9 mounted in butt 3 through a pipe 10 connected with the tank and a chamber inlet 6. The pipe has a check valve 11 and a controlling valve 12. Gas may be fed by pressure to tank 9 through a suitable cock 13 to which access may be had by opening a door 14 in the end of the butt. The butt is preferably made in sections and hinged at 15 so the tank may be easily removed for inspection and repairs.

After the gas is fed to the chamber, it is ignited by sparks produced by a roughened wheel 16 frictionally engaging a spark pro-

ducing material 17, such as flint. The flint is preferably mounted against a spring 19 in a hollow screw in breech body 4. A shaft 20 connected with wheel 16 passes out of the chamber through a stuffing box 21 and has a ratchet arm 22 on its outer end. The ratchet arm is preferably of the type having wedging faces 23 and rolling members 24 which wedge themselves between face 23 and a cylindrical part 25 of the shaft. The rolling members 24 are held in position by a cover 26. The arm has a slotted end 27 fitting a pin 28 on a bar 29 slidable in the breech body against a spring 30. Bar 29 has a depending lug 31 which is caught and held in cocked position by a hook end 32 of a trigger 33. A spring 34 keeps the hook end in engagement with lug 31. When trigger 33 is pulled to release lug 31, spring 30 will slide bar 29 and cause the roughened wheel 16 to rotate against the flint 17 and produce sparks to ignite the gas.

To prevent the gas from escaping out of chamber 5 before ignition and to allow it to escape after ignition, I provide an outlet valve in the form of a valve disk 35 which abuts a seat 36 around outlet 7. The disk has a stem 37 slidable in a connecting rod 38 against a spring 39. The rod is connected to an arm 40 on a shaft 41 passing out of the chamber through a stuffing box 42 similar to the stuffing box 20, and having an arm 43 on its outer end. The end of the arm is slotted at 44 to fit a pin 45 on bar 29. When trigger 33 is pulled to release bar 29 for producing a spark to ignite the gas, arm 45 and its associated parts will be moved to bring disk 35 from its seat 36 and open the valve to allow the exploded gas to escape.

As the exploded gas escapes through outlet 7 it forces a projectile 46 out through outlet 7 and the barrel. The projectile is fed to the outlet by a disk 47 having a peripheral notch 48 which conforms to that part of outlet 7 occupied by the disk. The disk is mounted on one end of a shaft 49 rotatable in breech body 4 and having an arm 50 on its other end connected through a pin and slot connection 51 with a reloading rod 52 slidable in body 4. One end of rod 52 is connected as shown at 52^a for operating valve 12. The other end of rod 52 is provided with a handle 53 adapted to be gripped by the hand to re-load the rifle. A projection 54 on rod 52 engages bar 29

when the rod is moved for reloading and thus brings bar 29 to cocked position as shown in Figure 6.

To prevent trigger 33 from being pulled while valve 12 is open, I provide a ledge 55 on the rod 52 which passes beneath the end 32 of the trigger during the opening and closing movement of valve 12. When the valve is nearly open, the ledge, having passed the hook end 32, will be out of its path to allow it to be swung downward by lug 31 as it slides over the hook end. When lug 31 is caught by hook end 32, the ledge as it passes beneath the hook end on its return movement will prevent pulling of the trigger until the valve is closed. When the valve is closed, the ledge is in the position shown in Figure 6 to allow free movement of hook end 32.

As disk 47 is moved to the position shown in Figure 4, to bring the projectile from the projectile feeding mechanism to outlet 7 there is danger of the next projectile passing in notch 48 and binding the disk to the breech body. To prevent this, I provide a vertically slidable stop 56 with an opening 57, through which the projectiles may pass, and a beveled edge 58 adapted to slip in between the first and second projectiles. When notch 47 is in position to receive the first projectile, beveled edge 58 will prevent the second projectile from entering the notch. The stop has a pin 60 extending through a slot 61 in the body. The pin is moved by an extension 62 on arm 50 against a spring 63 fixed to the body. The projectiles, preferably of cork or other harmless material, are fed through the opening in the stop by spring 64 in a tube 65 removably mounted in body 4.

To insure a full movement of rod 52 when reloading the rifle, I provide a pivoted lever 65 having its upper end connected to breech body 4 by a spring 66, and its lower end adapted to engage the teeth of a rack 67 carried by the rod 52. As the rack moves in either direction the lower end of the lever will engage the teeth and prevent reverse movement until rod 52 has moved its full stroke and the entire rack has passed the lower end of the lever.

To shoot a projectile, handle 53 is moved toward and away from the breech body. This shifts rod 52 and causes a projectile to be fed in outlet 7, the gas to be fed to chamber 5, the outlet valve to close, and the mechanism for producing sparks to be set in the cocked position ready for action upon the release of the trigger. When the trigger is pulled, bar 29 will be moved by spring 30 and will cause valve disk 35 to move from seat 36 and open the outlet valve, and wheel 16 to rotate against the sparking material 17 to produce sparks. The sparks produced will ignite the gas which will

escape through the outlet valve and force the projectile out of the barrel.

While I have described my invention as taking a particular form, it will be understood that the various parts may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a gas rifle, a combustion chamber; a barrel; controlling means for feeding gas to the chamber; means for producing sparks by friction to ignite the gas in the chamber; means for feeding projectiles to the barrel, and reloading means operatively connected with the gas controlling means, the spark producing means and the projectile feeding means.

2. In a gas rifle, a combustion chamber; means for feeding gas to the chamber; a member for holding spark producing material in the chamber; a shaft passing through the walls of the chamber; a wheel mounted on the shaft and frictionally engaging the sparking material; ratchet mechanism on the shaft outside the chamber, and means for actuating the ratchet mechanism to rotate the wheel.

3. In a gas rifle, a combustion chamber; means for feeding gas to the chamber; a member for holding spark producing material in the chamber; a shaft passing through the walls of the chamber; a wheel mounted on the shaft and frictionally engaging the sparking material; ratchet mechanism on the shaft outside the chamber; a spring-pressed slidable bar connected with the ratchet mechanism, and a trigger for holding the bar against the spring.

4. In a gas rifle, a combustion chamber; means for feeding gas to the chamber; a member for holding spark producing material in the chamber; a shaft passing through the walls of the chamber; a wheel mounted on the shaft and frictionally engaging the sparking material; a ratchet mechanism connected to the shaft outside the chamber; a spring-pressed member connected with the ratchet mechanism, and a trigger engaging said member to hold it against the spring.

5. In a gas rifle, a combustion chamber having an outlet leading to the barrel of the rifle; means for feeding gas to the chamber; a valve for opening and closing the outlet; friction means in the chamber for producing sparks to ignite the gas; a trigger, and means connected with the trigger for actuating the friction means to produce a spark to explode the gas and for opening

the outlet valve to allow the exploded gas to escape from the chamber.

6. In a gas rifle, a combustion chamber having an outlet leading to the barrel; a means for feeding gas to the chamber; a valve for opening and closing the outlet; friction means for producing sparks in the chamber to ignite the gas; a spring-pressed member; means for connecting the spring-pressed member with the valve; means for connecting the spring-pressed member with the friction means, and a trigger for holding and releasing the spring-pressed member.

7. In a gas rifle, a combustion chamber having an outlet; means for feeding gas to the chamber; friction means for producing sparks in the chamber to ignite the gas; a valve for opening and closing the outlet; means for feeding projectiles to the outlet; reloading mechanism connected with the projectile feeding means and the gas feeding means; a spring-pressed member operatively connected with the friction means and the valve; a projection on the reloading mechanism adapted to engage the spring-pressed member to move it to the active position, and a trigger adapted to engage the member to hold the member in and release it from the active position.

8. In a gas rifle, a combustion chamber having an outlet; means for feeding gas to the chamber; friction means in the chamber for producing sparks to ignite the gas; a valve for opening and closing the outlet;

a shaft extending through the wall of the chamber; an arm on the inner end of the shaft connected for opening and closing the valve; an arm on the shaft outside the chamber; a spring-pressed member connected with the arm and the friction means, and a trigger for holding the member against the action of the spring.

9. In a gas rifle, a combustion chamber having an outlet; means for feeding gas to the chamber; means for igniting the gas in the chamber; means including a valve for opening and closing the outlet; a disk having a notch in its periphery for conveying a projectile to the outlet; means for feeding projectiles to the notch; a common member operatively connected with the disk and the gas feeding means, and means actuated by said member and operatively connected with the outlet valve and the friction means for actuating the same.

10. In a gas rifle having an outlet leading to the barrel, a disk having a notch in its periphery for feeding projectiles to the outlet; a tube for feeding projectiles to the notch; a stop movable to keep projectiles in the tube, and means for operating the disk to bring the notch in position for receiving a projectile and for moving the stop to allow a projectile to pass in the notch.

In testimony whereof I have signed my name to this specification.

JUNIUS L. MALLORY.