S. D. MASTER.

GUN.

APPLICATION FILED JULY 11, 1919.

1,331,474.

Patented Feb. 17, 1920.

2 SHEETS—SHEET 1.

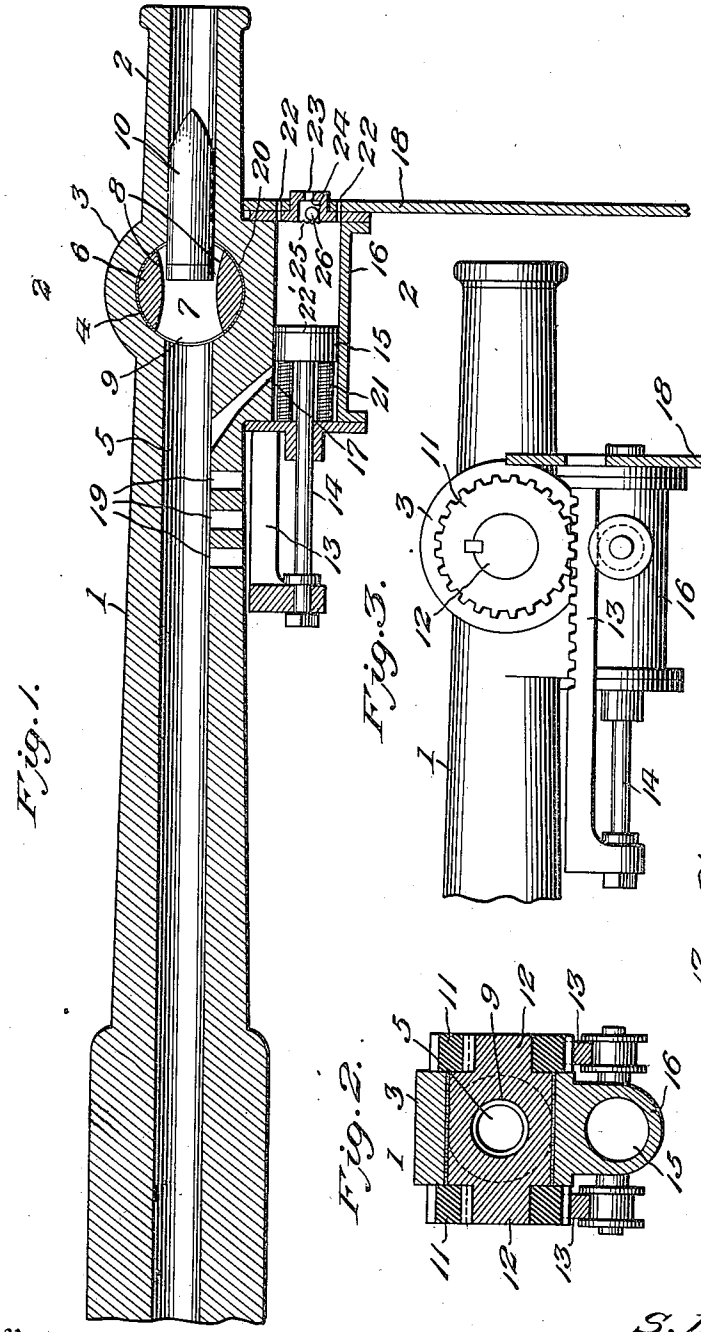


Fig. 1.

Fig. 3.

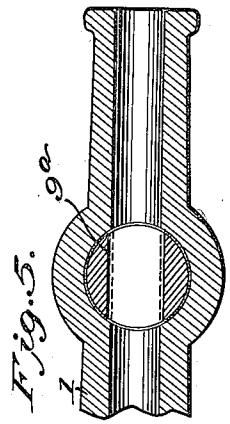


Fig. 5.

Fig. 2.

Fig. 4.

Witnesses

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2 SHEETS—SHEET 2.

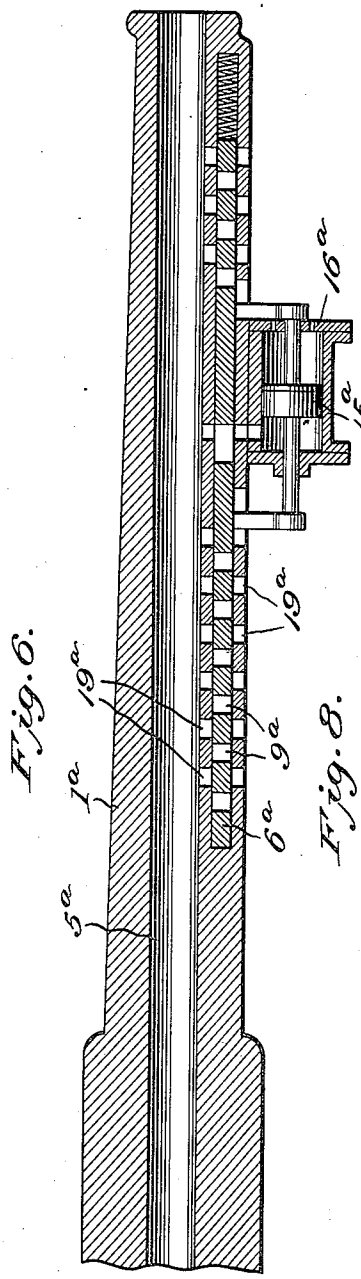


Fig. 6.

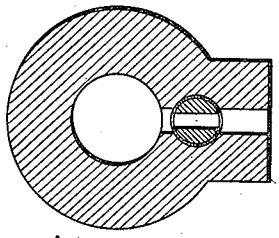


Fig. 10.

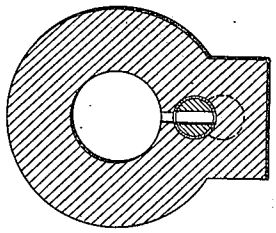


Fig. 8.

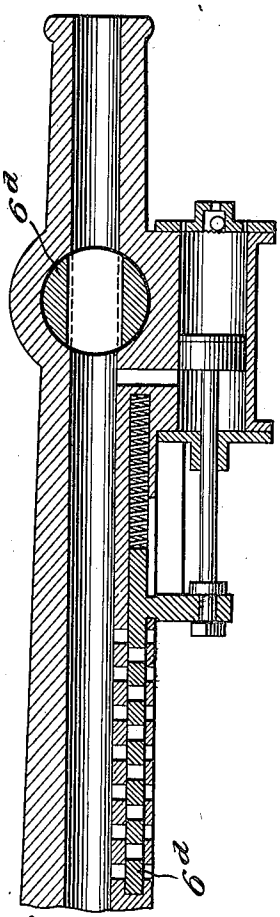


Fig. 9.

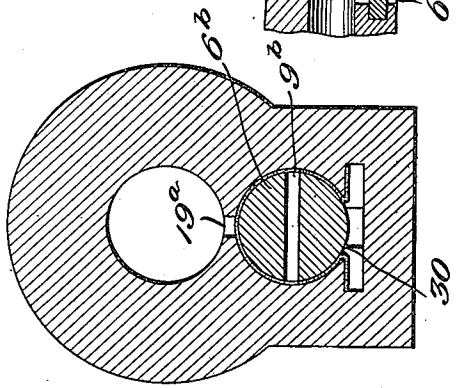


Fig. 7.

Witnesses

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UNITED STATES PATENT OFFICE.

SHAVERKSHA D. MASTER, OF BROACH, INDIA.

GUN.

1,331,474. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed July 11, 1919. Serial No. 310,036.

To all whom it may concern:

Be it known that I, SHAVERKSHA DORABJI MASTER, a subject of the King of England, residing at Broach, India, have invented new and useful Improvements in Guns, of which the following is a specification.

The object of my present invention is the provision of a gun, of heavy ordnance type, embodying a provision whereby the gun in action is rendered flameless and partly or wholly noiseless.

Manifestly in an action between enemy parties at night or under favorable circumstances, the party having guns constructed in accordance with my invention will enjoy the great advantage of not being seen or heard by the enemy party, with the result that such enemy party will find it exceedingly difficult to get the range of the party provided with guns embodying my said invention.

Other objects and practical advantages of the invention will be fully understood from the following description and claims, when the same are read in connection with the drawings, accompanying and forming part of this specification, in which:

Figure 1 is a longitudinal section of a gun constructed in accordance with my present invention.

Fig. 2 is a transverse section of the same, taken in the plane indicated by the line 2—2 of Fig. 1.

Fig. 3 is a detail view illustrative of the relative arrangement of the means for actuating the rocking valve.

Fig. 4 is a view showing the piston and cylinder comprised in my improvement.

Fig. 5 is a detail view illustrative of a slightly modified rocking valve.

Figs. 6, 7, 8, 9 and 10 are views illustrative of modifications of my invention, and hereinafter explicitly referred to.

Similar numerals designate corresponding parts in Figs. 1 to 4, to which reference will first be had.

At 1 is the barrel of the novel gun which is enlarged adjacent to its mouth 2, as indicated by 3. In the said enlargement 3 is formed a chamber 4 which is circular in cross-section, and intersects the bore 5 of the barrel at right angles, Figs. 1 and 2. Disposed in the chamber 4 is a rocking valve 6 in which is a passage 7, the walls 8 of which are lengthwise convex and are so disposed as to form a bore 9 slightly larger than the bore 5 and with flared ends, as will be readily understood by reference to Fig. 1. The said formation of the bore 9 through the rocking valve 6 is materially advantageous, inasmuch as it contributes to safety in the operation of the gun. According to my invention the rocking valve 6 rests in the position shown in Fig. 1, before and coincident with the firing of the gun. When, however, the gun is fired and the projectile indicated by 10 in Fig. 1, is about to leave the mouth of the gun, the valve 6 is turned to a position at right angles to that shown in Fig. 1, and is thereby enabled to promptly and completely bar the passage of the gases that follow the projectile. This has the effect of rendering the firing of the gun practically flameless, so far as the display of flame is concerned, and partly or wholly noiseless, and is therefore materially advantageous for the reasons before set forth.

The valve 6 is timed for the quick turning thereof, immediately after the projectile 10 has passed forwardly beyond the valve and the chamber thereof. The said valve 6 has spur gears 11 on its trunnions 12, and intermeshed with the said spur gears 11 are rear bars 13 carried by a piston rod 14, the piston 15 of which is movable in a cylinder 16. The cylinder 16 is formed integral with the barrel 1, or is suitably fitted to the said barrel, and a port 17 is interposed between the bore 5 and the interior of the cylinder 16, at a point in rear of the piston 15. From this it follows that after the projectile has passed the valve 6, but not before, a portion of the gases will enter the cylinder 16 and acting against the piston 15 will turn the valve 6 in the manner and for the purpose set forth.

At 18 is a screen suitably fixed with respect to the gun barrel 1, and it will here be understood that at points in rear of the said screen 18 the gun barrel 1 is provided with a plurality of vents 19 through which the gases and flame are discharged downwardly after the projectile 10 has passed the valve 6 and the said valve 6 has been moved to a closed position. Being screened as stated, the said discharged gas and flame will not be visible to the enemy. The gas and flame emanated through the vents 19 may, when deemed expedient, be received in a pit or other receptacle provided for the reception thereof, in which event the screen alluded to may be dispensed with.

In the present and preferred embodiment of my invention, the valve chamber 4 is lined or packed with asbestos as shown in Fig. 1.

I do not restrict myself to the specific form shown in Fig. 1 for the bore 9 through the rocking valve 6. On the other hand the said bore may be of even diameter throughout, though slightly larger than gun bore 5, as indicated by 9^a in Fig. 5.

In order to return the valve 6 to its normal position, shown in Fig. 1 after firing of the gun, I make the provision best shown in Fig. 4. By particular reference to said figure it will be noted that retractile springs 21 are interposed between the piston 15 and the cylinder for the retraction of the piston subsequently to a firing of the gun. At the opposite side to the springs 21 the piston 15 is provided with a pad 22 of leather or other soft material, calculated to take up shock when the piston brings up against the forward cylinder heads. In said cylinder head are apertures 22 in communication with the atmosphere. Also in said head is a comparatively large aperture 23 including a reduced valve seat 24 between which and a foraminous diaphragm 25 is arranged a valve, preferably a ball valve, 26. On forward movement of the piston 15 the valve 26 will be seated, and hence the air escaping slowly through the apertures 22 will adequately cushion the piston 15. On the backward movement of the piston 15, however, the valve 26 will be automatically opened so as to allow a large volume of air to enter the cylinder 16 and thereby avert retarding of the backward movement of the piston. Manifestly when the piston 15 is relieved of pressure at its back, the springs 21 will operate to retract the piston and in so doing will return the valve 6 to the position shown in Fig. 1.

It will be apparent from the foregoing that notwithstanding the practical advantages ascribed to my novel gun, the same is simple and inexpensive in construction, and at the same time is reliable in operation; the latter end being attained by the simple process of properly timing the turning of the valve 6 about its axis relative to the period immediately after the projectile 10 has passed the projectile 4.

In the embodiment shown in Figs. 6, 8, 9 and 10, vents 19^a are provided at intervals through almost the entire length of the gun barrel 1^a in communication with the bore 5^a thereof. By the provision of the multiplicity of vents 19^a, the escaping gas and flame are entirely reduced through diffusion because of the large area of escape, and inasmuch as the gases do not emanate from the mouth of the barrel, there will be no report and no emanation of flame. For the control of the said vents 19^a, I provide the normally closed, rectilinearly movable valve 6^a, best shown in Figs. 6 and 9. The said valve 6^a is provided with ports 9^a and is positioned to intersect the vents 19^a as shown. Thus in one position the valve 6^a obstructs the vents 19^a, and in another position when the ports 9^a are in registration with the portions of the vents 19^a, free passages are afforded for the exit of gases and flame from the bore, 5^a.

When desirable a valve 6^b, such as shown in Fig. 7, may be employed in lieu of the valve 6^a; the said valve 6^b being arranged longitudinally of and in parallelism with the bore 5^a, and being adapted to be turned about its axis to position its port 9^b in and out of registration with the portions of the vents 19^a.

The valve 6^a is disposed in a chamber 30, and manifestly when the gun is fired, a portion of the gas will enter the said chamber and will thereby counteract the great pressure in the bore 5^a, and by so doing will balance the valve 6^a, and by reducing the load on the said valve, will assure easy movement thereof.

For the opening of the valve 6^a at the proper time, I provide a piston 15^a connected substantially as before described with the valve 6^a; the said piston 15^a being disposed in a cylinder 16^a, which cylinder is preferably arranged relative to the barrel 1^a, and is equipped similarly to the cylinder 16 before described.

It is essential that the valve be closed in time to prevent gases and flame from emerging at the mouth of the gun; and it is equally essential that the valve must not close before the passing projectile has traversed the length of the series of vents 19^a and passed the same.

Manifestly the valve 6 or 6^a should be positioned adjacent to the mouth of the gun. The cylinder and the piston therein, however, may be located at any convenient point in the length of the gun, provided it is feasible to move the valve by movement of the piston.

In the modification shown in Fig. 9 I employ both the rocking type of valve 6^c and the rectilinearly movable type of valve 6^d; the said valves being connected with the piston in the cylinder in substantially the same manner as before described, and so that movements of the valves will attend movements of the piston. If preferred, however, separate cylinders and pistons therein may be employed in conjunction with each of the valves 6^c and 6^d without involving departure from the scope of my invention as defined in my appended claims.

It will be apparent from the foregoing that notwithstanding the practical advantages possessed by my novel gun, the same may be made almost as cheaply as ordinary guns of heavy ordnance type.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. In a gun of ordnance type, the combination of a barrel having a valve chamber adjacent to its mouth or muzzle and also having means in rear of said chamber for venting gases, and a rocking valve disposed in said chamber and having a bore or port that is normally coincident with the bore of the barrel, a cylinder in communication with the bore of the barrel, at a point between the chamber and the venting means, and a piston in said cylinder and connected with the valve for closing the valve after a projectile on firing of the gun has passed the valve.

2. In a gun of ordnance type, the combination of a barrel having a valve chamber adjacent to its mouth or muzzle and also having means in rear of said chamber for venting gases, and a rocking valve disposed in said chamber and having a bore or port that is normally coincident with the bore of the barrel, at a point between the chamber and the venting means, a piston in said cylinder and connected with the valve for closing the valve after a projectile on firing of the gun has passed the valve, and means for returning the piston and the valve to their normal positions.

3. A gun of the ordnance type, comprising a barrel having venting means, a valve located adjacent to the mouth or muzzle of the gun for closing the bore subsequently to the passage of a projectile, said valve being movable by the gases in the barrel on firing of the gun, and means for shielding the flare that attends the venting of the gases and flame.

4. A gun of the ordnance type having a bore and vents leading laterally from the bore and also having a chamber in parallelism with the bore and intersecting said vents, an apertured valve disposed in said chamber and having ports, a rocking valve having a bore adapted to normally rest coincident with the bore of the valve, and means whereby the valves are moved by the gases in the bore upon firing of the gun.

5. A gun of the ordnance type comprising a barrel, lateral vents in communication with the valve, a chamber parallel to the barrel and intersecting said vents, and a rocking valve disposed in said chamber and arranged longitudinal of and in parallelism to the barrel and having ports, said valve being movable by gases incidental to firing of the gun.

In testimony whereof I affix my signature.

SHAVERKSHA D. MASTER.