

UNITED STATES PATENT OFFICE.

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TORPEDO-GUN.

No. 819,834.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDMUND L. ZALINSKI, of the United States Army, retired; a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Torpedo-Guns, of which the following is a specification.

This invention relates to guns for propelling torpedoes.

The object of the invention is to produce a gun from which torpedoes or similar projectiles for submarine action may be thrown with different velocities, obtaining different ranges by the combustion of similar powder charges without changing the elevation of the gun.

To this end the invention consists in a gun having a large combustion-chamber and means to regulate the amount of powder-gas which may pass from this chamber to the barrel in which the projectile is seated, thus acting thereon and at the same time permit the escape of surplus gases. Thus a maximum charge may always be used; but the effective powder-pressure on the projectile can be regulated according to circumstances.

A projectile is likely to ricochet from the surface of the water if thrown at a lesser angle than about fifteen degrees with relation to the surface. It becomes desirable to project torpedoes or shells expected to destroy torpedoes or submarine boats at such angles that said projectiles shall enter the water directly. To make sure of this, at short ranges it ordinarily is necessary to use less powder charges than at longer ranges or to change the elevation of the gun, either of which changes involves a loss of time which may be fatal to successful action. Therefore a means which can be instantaneously available to change the effective range of a loaded gun is very desirable under some circumstances.

In the drawings I illustrate simple forms of guns to show the principles involved. The same principles are applicable to very many forms of guns and magazine systems. Rapid-fire systems of ordnance already well known can be modified to embody the principles herein set forth, so that great rapidity of fire can be maintained and the range varied with equal rapidity without changing the gun elevation.

My illustrations are diagrammatic and

illustrate merely the principles involved in simple form. In practice packing to insure close joints, buffers to prevent derangement, and other devices known in the art of gunnery may be employed.

Figure 1 is a longitudinal section of the rear portion of a gun, illustrating the principles of my invention in one form. Fig. 2 is a section on line 2 2. Fig. 3 is a section on line 3 3, and Fig. 3^a is a similar section with sleeve turned to partly allow gas escape. Fig. 4 is a longitudinal section of a modification. Fig. 5 is a rear view of the gun, Fig. 4. Fig. 6 is a rear end view of gun, Fig. 1.

Let the numeral 1 illustrate the barrel of a breech-loading gun in which a projectile or torpedo 2 is placed. The gun-barrel 1 is surrounded by a strong casing or outside barrel 3, a passage 4 being thus provided between the outer and inner barrel. In the barrel 1 in rear of the projectile-chamber there are passages 5 5 leading through the walls of the inner barrel to the outer passage 4. A sleeve 6 surrounds this perforated portion of barrel 1, said sleeve having passages 7, which may be brought into register with a portion or all of the passages 5, or sleeve 6 may be turned so as to partly or wholly close all the passages 5 5. Sleeve 6 has teeth 8 thereon with which a pinion 9 engages. A handle 10 outside the gun connects with this pinion, and by means of this handle the pinion 9 and sleeve 6 can be rotated. An index is arranged in suitable relation to handle 10, so as to denote the position of sleeve 6 with relation to the barrel 1, and this position determines the effective pressure on the projectile.

A permanent breech-piece 12 serves to close the rear end of passage 4. A quickly-removable breech or cartridge-holder 11 may be opened to insert the projectile 2; and this breech may also contain the powder charge 13, which charge is ignited in any suitable manner common to this art.

Now if sleeve 6 is turned so as to effectively close all the openings 5 the firing of charge 13 will cause the full powder-pressure to be applied to the projectile in barrel 1; but if the sleeve be turned so that all passages 5 and 7 are in communication a large proportion of the gas developed by the combustion will pass by the passages 5 5 to the by-pass barrel 4, such being the line of least resistance, and reduced pressure will be applied to the pro-

jectile, and the sleeve 6 can be turned to adjust this pressure to a nicety, as demanded for the ranges required.

In Fig. 4 the numeral 21 denotes the gun-barrel proper, which barrel is closed behind a projectile by the sliding trap 22, which has a passage 23 large enough for the projectile to enter. Chamber 24 in rear of the barrel proper is closed by any suitable fermature, as 25. A chamber 26 at the side of the chamber 25 opens into the same and is closed at the rear by a breech-plug 27. Chamber 26 receives the firing charge, which is ignited in any convenient manner. When trap 22 is moved so as to close the by-passage or gas-escape barrel 29, it opens the barrel 21, and the trap 22 can be shifted so as to place the opening 23 in line with barrel 29, at the same time closing the rear opening into barrel 21, or the trap 22 can be placed in an intermediate position, where opening 23 communicates between the rear chambers 24 26 and the front chambers 21 29. Thus a gas-pressure developed in chambers 24 26 can be directed to the gun-barrel proper against the projectile or to the by-passage or barrel 29, where it may escape without acting on the projectile, or the gas-pressure may be divided, so that any desired proportion thereof may be directed to the projectile and the remainder permitted to escape. Trap 22 may be moved by pinion 30, engaging rack 31 thereon, or by any other suitable means. An index 32 on the trap will serve to direct the gunner as to the position desirable for any specified range. By suitable mechanism this index may be made to indicate on range-dials. A housing 33 incloses the upper part of the charge-directing trap 22, as shown in the illustrations. Of course the gun can be changed as to its range by changing its elevation, and it is desirable that the index 32 be made to show ranges under different conditions likely to arise. The elevations had best be limited to, say, fifteen degrees, thirty degrees, and forty-five degrees, the range-dial graduations either being made to correspond or else have separate interchangeable dials to correspond to the standard elevation in use. These should be arranged so as to be readily changed.

I have attempted to show only a few of the many modifications to which my invention is adapted. The important point is that any proportion of the maximum pressure of the powder-gas can be directed to effective work behind the projectile, and any desired proportion may be allowed to escape without such effort and in a direction where it will do no damage.

From the above it should be understood that my invention embraces, broadly, such a gun as will be capable of being loaded with a regular service charge of explosive, and without removing the charge its effective force

may be instantly changed by manipulation of the gun without changing the elevation of the gun.

Of course the elevation of the gun may be changed in any usual manner; but the change of effectiveness of the powder charge may be made much more rapidly. Both means of securing range may be employed when desirable.

What I claim is—

1. A gun having a suitable powder-chamber, a barrel for projectiles and a passage for waste gases, and means for directing gas from the powder-chamber to the gun-barrel or to the escape-passage in definite quantities.
2. A gun having a powder-chamber, a barrel for projectiles and a by-passage, and adjustable means for directing gas from the powder-chamber to the barrel or to the by-passage in regulated proportions.
3. The combination with the powder-chamber and projectile-barrel of a gun, of intermediate mechanism whereby a regulated part of the gas-pressure in the powder-chamber may be admitted to the said barrel, and the remaining powder-pressure diverted.
4. The combination with the projectile-barrel of a gun, and a powder-chamber provided with means for exploding a powder charge therein, of adjustable means for regulating the pressure which may pass from the powder-chamber to the projectile-barrel.
5. In a gun, a projectile, barrel, a powder-chamber, and means for firing powder in the chamber and for admitting only a determined portion of the powder-gases to the barrel to develop a predetermined pressure therein.
6. In a gun, a projectile-barrel, a powder-chamber, interposed means for excluding a part of the powder-gases while permitting the remainder to pass to the barrel, and an index by which the effective amount of gas admitted to the barrel may be observed.
7. In a gun, a powder-chamber, a projectile-barrel and a by-passage, each communicating with said chamber, and a movable part having controlling means outside the gun by which a portion of the pressure in the powder-chamber can be directed to either the by-passage or the barrel.
8. In a gun, a powder-chamber, a projectile-barrel, and a by-passage, each communicating with said chamber, means for controlling the communications between said parts, and a range-dial and index operatively connected to said controlling means, all combined.

In testimony whereof I affix my signature in presence of two witnesses.

EDMUND L. ZALINSKI.

Witnesses:

DAISY L. ROBINSON,
SIMON L. ADLER.