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C. H. TAYLOR.

GAS OPERATED MECHANISM FOR FIREARMS.

APPLICATION FILED MAR. 20, 1901. RENEWED MAY 24, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

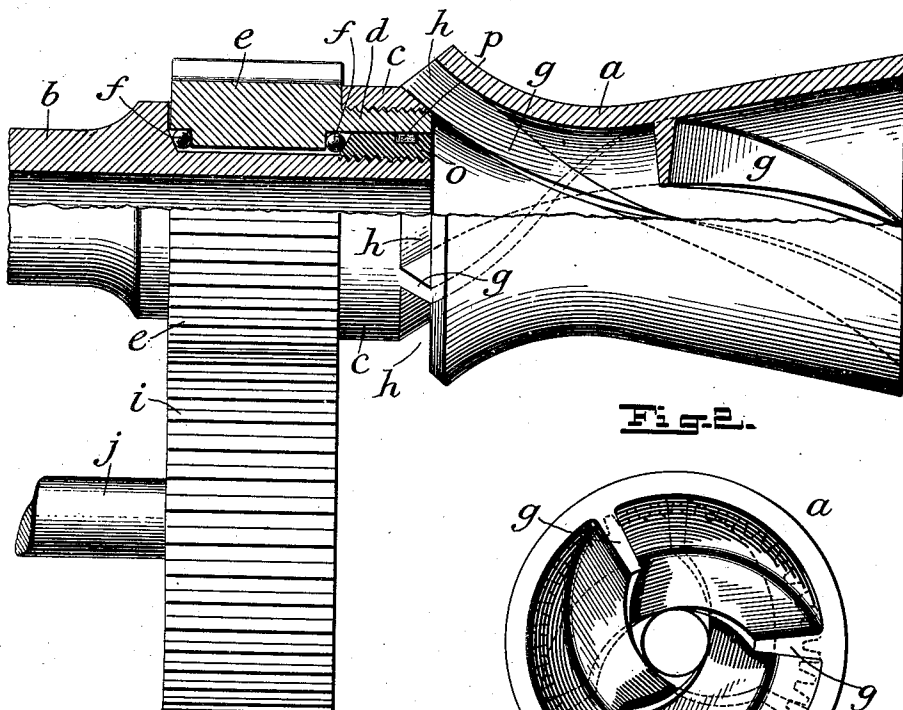


Fig. 2.

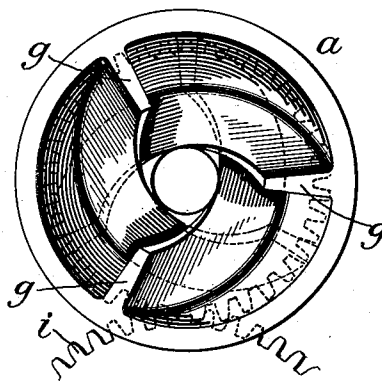
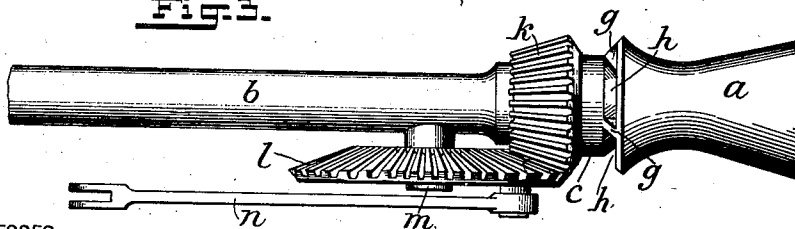


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

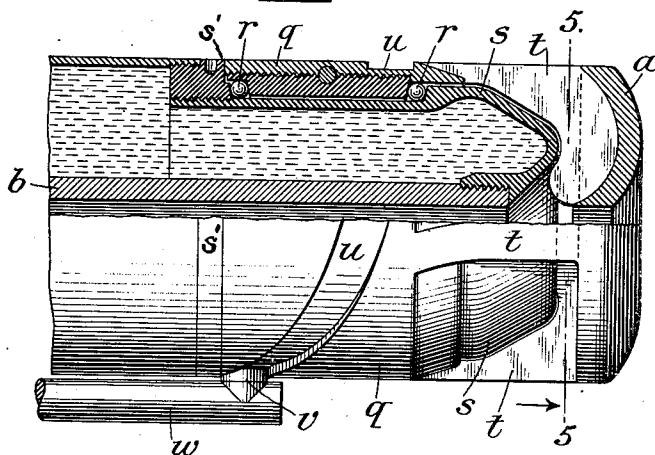
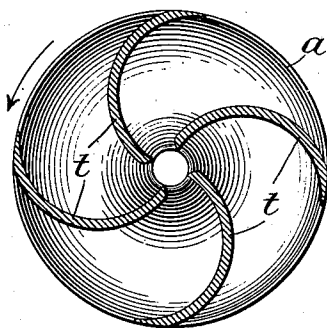


Fig. 5.



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UNITED STATES PATENT OFFICE.

CECIL HAMELIN TAYLOR, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR,
BY MESNE ASSIGNMENTS, TO KNOX TAYLOR, OF HIGHBRIDGE, NEW
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GAS-OPERATED MECHANISM FOR FIREARMS.

No. 811,595.

Specification of Letters Patent.

Patented Feb. 6, 1906.

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To all whom it may concern:

Be it known that I, CECIL HAMELIN TAYLOR, a citizen of the United States, residing at Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas-Operated Mechanism for Firearms, of which the following is a specification.

The object of this invention is to utilize the expansion of the gases generated by the explosion of the charge of the gun; and it consists in providing the gun with an attachment or turbine that shall be rotated by the impact of the expanding gases of explosion.

In the accompanying drawings, Figure 1 represents a side elevation of the muzzle of a gun provided with the attachment or turbine, the muzzle of the gun and a portion of the mechanism being shown partly in section. Fig. 2 represents an end elevation of the cylinder. Fig. 3 represents a side elevation of a gun provided with the improved attachment, showing means for connecting same with other parts of the gun mechanism. Fig. 4 represents a side elevation, partly in section, of another form of the attachment. Fig. 5 represents a transverse section on the line 5 5 of Fig. 4.

The attachment comprises, essentially, a casing or turbine movably mounted adjacent to an opening that will permit the escape of the gases of explosion in such a way as to cause same to be actuated by the expansion of said gases.

As shown in Fig. 1 of the drawings, the attachment comprises a casing *a*, which is preferably cylinder-shaped and extends beyond and in line with the barrel *b* of the gun. Said cylinder is secured by a shank *c* to a flange *d*, provided upon a gear-wheel *e*, that is rotatably mounted, preferably, on ball-bearings *f* upon the gun-barrel. The interior of the cylinder is provided with spirally-arranged vanes *g*, which are constructed to leave a central opening through the cylinder, having at least the diameter of the bore of the gun. Preferably the cylinder is provided with openings *h*, adjacent to the muzzle of the gun, which permits currents of air to be drawn through or sucked in by the expanding gases. A pinion *i*, provided upon a suitable shaft *j*, meshes with the gear *e*, so that the rotation thereof may be utilized to operate other parts

of the gun mechanism. Instead of the gear *e* a bevel-gear *k* may be connected with the cylinder which engages with the corresponding gear *l*, journaled upon a stud *m*, secured to or formed integral with the gun, whereby a reciprocatory motion may be imparted to the link *n*. A suitable collar *o*, having a packing *p*, is secured to the end of the gun to hold the cylinder against displacement.

In the construction shown in Figs. 4 and 5 the attachment or turbine has a central opening for the passage of the projectile and is secured to a collar *q*, rotatable on ball-bearings *r*, provided on the water-jacket end piece or cup *s* of the gun. The water-jacket end piece or cup *s* is secured in a ring *s'* at the outer end of the water-jacket proper and forms a seat for the collar *q* and its bearings, the vanes *t* being formed to correspond to the shape of the end cup. The mounting of the collar on the water-jacket in this manner prevents any overheating of the bearing of the turbine and consequent burning off of lubricant. The collar *q* is provided with a spiral groove *u*, engaged by a stud *v* upon the end of a reciprocating lever *w*, whereby the other parts of the gun may be operated.

The vanes or flanges are so arranged in relation to the muzzle or the port provided in the gun that the outrushing gases of explosion, as well as the intrushing current of air, if any, impinge diagonally against same. The path of the expanding gases is therefore deflected; but the escape of the gases is not impeded as when the opposing surfaces are arranged across the path of the gases. In case the attachment is secured to the gun to be operated by the gases that escape from the muzzle thereof the impact of the gases will tend to counteract and overcome the recoil, particularly in the forms shown in Figs. 4 and 5, which is designed with this end in view. In this construction the end of the casing *a* is closed by a wall, which is substantially transverse to the axis of rotation of the turbine, so the gases escaping through the passages between the vanes are deflected rearwardly and react to operate as a recoil-check.

It is obvious that the attachment can be constructed so that it can be moved otherwise than rotated, if desired, and various other changes within the skill of the mechanic can be made in the mechanism herein de-

scribed without departing from the spirit of the invention, provided the means recited in the following claims be employed.

I claim as my invention—

- 5 1. The combination with a gun of a turbine actuated by the escaping gases of combustion, a reciprocating part and means whereby said reciprocating part is actuated by said turbine, substantially as described.
- 10 2. The combination with a gun of a rotatable attachment provided with vanes arranged spirally to the path of the escaping gases of combustion, a reciprocating part and operative connections between said attachment and said reciprocating part whereby said reciprocating part is actuated by said attachment, substantially as described.
- 15 3. The combination with a gun, of a turbine attachment comprising a casing having
20 surfaces arranged to deflect rearwardly the escaping gases of combustion and vanes actuated by the gases, whereby the gases react to check the recoil.

4. The combination with a gun having a water-jacket of an end piece or cup secured 25 in the end of the water-jacket and forming a seat for an external bearing and a rotatable part mounted in said bearing.

5. The combination with a gun having a water-jacket, of a turbine actuated by the escaping gases and having a bearing on said 30 water-jacket and a gun mechanism operated by said turbine.

6. The combination with a gun having a water-jacket, of an end piece or cup secured 35 in the end of the water-jacket, a turbine actuated by the escaping gases and having a bearing on said end piece or cup and a gun mechanism operated by said turbine.

In testimony whereof I sign this application, in the presence of two witnesses, this 40 15th day of March, 1901.

CECIL HAMELIN TAYLOR.

Witnesses:

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LUCIUS E. VARNEY.