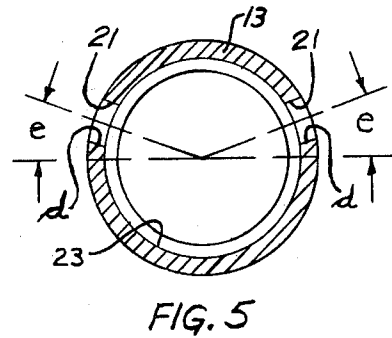
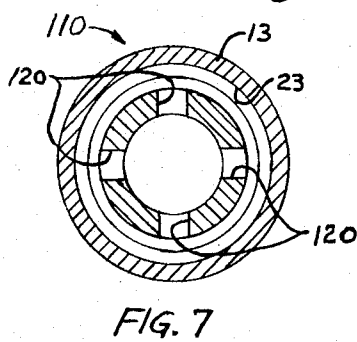
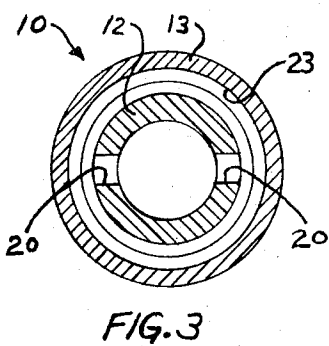
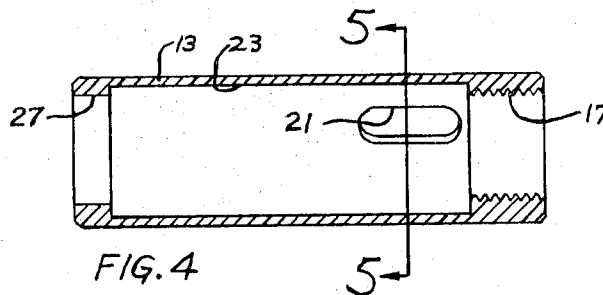
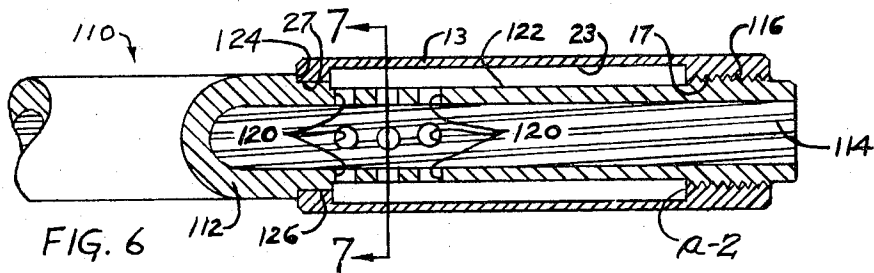
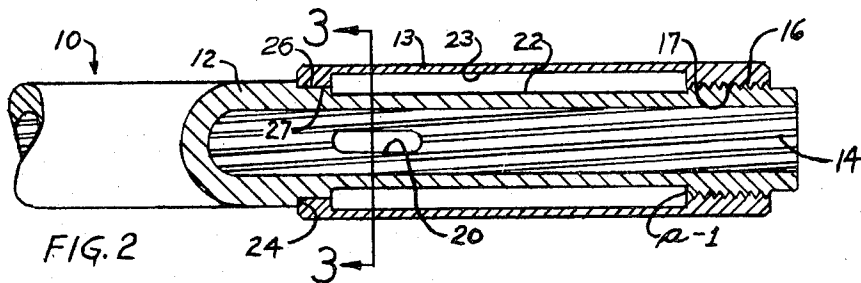
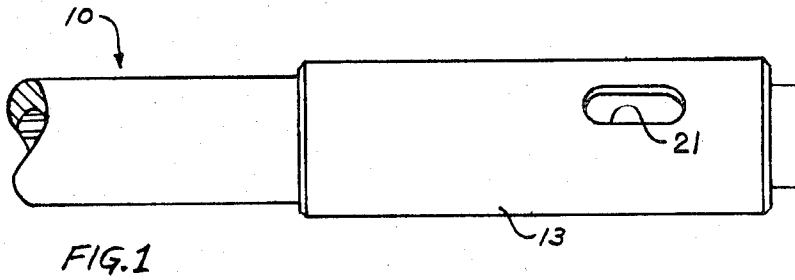




FOR: COMPENSATOR SYSTEM FOR SPORTING AND TARGET RIFLES

My invention relates to sporting and target rifles.

The principal object of my invention is to provide a compensator system for such rifles which is effective to eliminate both gas blow-by and muzzle jump and reduce the force of recoil in firing any rifled firearm equipped with my compensator system.

The foregoing object of my invention and the advantages thereof will become apparent during the course of the following description, taken in conjunction with the accompanying drawings, in which:

FIGS. 1-3 are, respectively, fragmentary side elevational, fragmentary longitudinal sectional and transverse sectional views of a compensator system for sporting and target rifles embodying my invention and shown in use on a high-powered rifle;

FIGS. 4 and 5 are, respectively, longitudinal and transverse sectional views of a part of said compensator system; and

FIGS. 6 and 7 are, respectively, fragmentary longitudinal sectional and transverse sectional views of another embodiment of my invention also shown in use on a high-powered rifle; said FIGS. 3, 5 and 7 being on a larger scale than FIGS. 1, 2, 4 and 6.

Referring to the drawings in greater detail and first to the embodiment of my invention shown in FIGS. 1-3, the same, which is generally designated 10, comprises, in the instance, modifications of the forward end of the barrel 12 of a high-powered rifle having conventional rifling 14 therein. Said modifications include the provision of gas chamber means external to the outside diameter of said forward end of the barrel 12 and changes involving the outside diameter and wall thickness of said forward end of the barrel 12. Said changes involving the outside diameter of said forward end of the barrel 12 consist of an annular shoulder 24, a mating cylindrical surface 26, a cylindrical undercut section 22 and threads 16. Said changes also consist of a pair of axially elongated slots 20 formed through the wall thickness of the forward end of the barrel 12 and diametrically disposed with respect to each other on the horizontal diameter of said barrel 12. Said slots 20 serve as gas release ports for the barrel 12 and inlet ports for said gas chamber means and have an effective area equal to two times that of the bore of the barrel 12. Said gas chamber means is formed both by said undercut section 22 and a cylindrical undercut section 23 formed in the inside diameter of a sleeve 13 which is held in place on and gas sealed in respect to said barrel 12 by a mating cylindrical surface 27 and by threads 17 formed in the inside diameter of said sleeve 13. The undercut section 22 on the barrel is turned to the minor diameter of thread 16 or less, as permissible, and the undercut section 23 on the sleeve is bored to such dimension as will, in conjunction with undercut section 22 create, for the particular caliber of rifle in question, when the sleeve 13 is assembled to the barrel 12, a gas expansion chamber equal in cross-sectional area to one and one-half times the area of slots 20. Said sleeve 13 is fastened in place on the outside diameter of said barrel 12 by said threads 17 which engage said threads 16, both of which are extra fine series. The mating cylindrical surfaces 26 and 27 form a gas tight sliding fit between each other. The inner end of said sleeve 13 bottoms against the shoulder 24 when said sleeve is fas-

tened in place on said barrel 12. Said undercut sections 22 and 23 define annular shoulders at opposite ends of said gas chamber means, the forward one of which is designated a-1. Said sleeve 13 is provided with a pair of axially elongated slots 21 formed through the wall thickness thereof and circumferentially spaced apart from each other, both disposed above the horizontal diameter of said barrel 12, each at an acute angle e in respect thereto. The angle e is of the order of 18 to 36 degrees, depending on the barrel weight and the velocity of the bullet. Said slots 21 serve as outlet port means for said gas chamber, and have a total area equal to that of the chamber. Said sleeve 13 may be provided with any suitable iron sight (not shown) on the top surface outside diameter thereof.

In operation of said compensator system 10, when any rifle equipped therewith is fired gases vent from the interior of the forward end of the barrel 12 through the slots 20 and fill said gas chamber means and produce an axially operative forward force acting upon said annular shoulder a-1 which opposes recoil of said rifle. Gases also vent from the interior of said gas chamber means through the slots 21 into and against the atmosphere and produce a downwardly operative force acting upon the edges d of said slots 21 which eliminates muzzle jump of said rifle. The filling of the chamber of said gas chamber means with gases and the venting of said gases therefrom is accomplished prior to the bullet reaching the muzzle of barrel 12 and while said bullet is still sealing the bore of said barrel, thereby eliminating gas blow-by. As the rifle bullet passes the slots 20 said escaping gases are those of combustion from the firing of said rifle. Said combustion gases are backed up under pressure all the way back to the breech of said rifle and follow the path of least resistance, i.e., out of the slots 20 and into said gas chamber means so as to be operative against said shoulder a-1. As the bullet travels from the slots 20 to the muzzle of the barrel 12 it has a greater tendency to stabilize due to relief of the combustion gas pressure behind the same. Greater accuracy is achieved for this reason and because of the reduction of turbulence due to the elimination of gas blow-by.

Referring to said other embodiment shown in FIGS. 6 and 7, the same, which is for smaller bore rifles, is generally designated 110. Parts thereof similar to those of the embodiment 10 are designated with like numbers except in the 100 series. The inlet port means for said gas chamber means in this embodiment 110 is formed of three axially spaced apart sets of aperture means, each set being in the form of four diametrically spaced apart cylindrical holes 120, each said hole 120 being formed through the wall thickness of said forward end of the barrel 112. Two holes of each set of holes 120 are aligned with the horizontal diameter and the other two thereof with the vertical diameter of said muzzle 112. The effective area of all of the holes 120 is likewise two times that of the bore of the barrel 112. The operation of said compensator system 110 is substantially the same as that of the compensator system 10, except that the venting of gases from the interior of the barrel 112 into said gas chamber is through the holes 120 and an annular shoulder a-2 produces, via the gases which fill said gas chamber means, the axially operative forward force which opposes recoil.

It will thus be seen that there has been provided by my invention a compensator system for sporting and

target rifles in which the object hereinabove set forth together with many thoroughly practical advantages has been successfully achieved. While preferred embodiments of my invention have been shown and described, it is to be understood that variations and changes may be resorted to without departing from the spirit of my invention as defined by the appended claims.

What I claim is:

1. In combination with a rifle having a relatively long barrel with a cartridge chamber at one end and a muzzle at the other end with a rifled bore of constant diameter therebetween, a compensator system for minimizing gas blow-by, muzzle jump, and recoil comprising a cylindrical member extending coaxially with and radially outwardly spaced from said barrel at the muzzle end thereof, a threaded section on the exterior of said barrel, a complimentary internal thread on said cylindrical member for seating and sealing one end of said member to the exterior of said barrel, a circumferential shoulder on said barrel spaced from the threaded section thereon, the other end of said cylindrical member being seated in sealing relation on said shoulder, said cylindrical member in combination with said barrel defining an annular gas expansion chamber, a plurality of gas ports extending radially through said barrel provid-

ing a fluid communication path between the bore of said barrel and the interior of said gas expansion chamber, a pair of gas discharge vents at the muzzle end of said cylindrical member extending radially and angularly oppositely upwardly therethrough so as to provide a fluid communication path between the interior of said gas expansion chamber and the atmosphere, said gas ports having a total area at least twice the cross sectional area of the bore of said rifle and being spaced rearwardly from the muzzle of said rifle a distance approximately $2\frac{1}{2}$ inches and substantially less than the spacing between said cartridge chamber and said ports whereby high pressure gases generated upon firing of a cartridge propel a projectile through a relatively long path within said barrel prior to being vented radially outwardly through said gas ports into said gas expansion chamber, said gases moving forwardly through said expansion chamber, thence radially outwardly through said gas discharge vents while the projectile propelled by said gases is still in sealing engagement with the bore of said barrel thereby exerting an axial and radial force on said barrel in opposition to recoil and muzzle jump, respectively, and minimizing blow-by upon exit of the projectile from the muzzle of the rifle.

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