

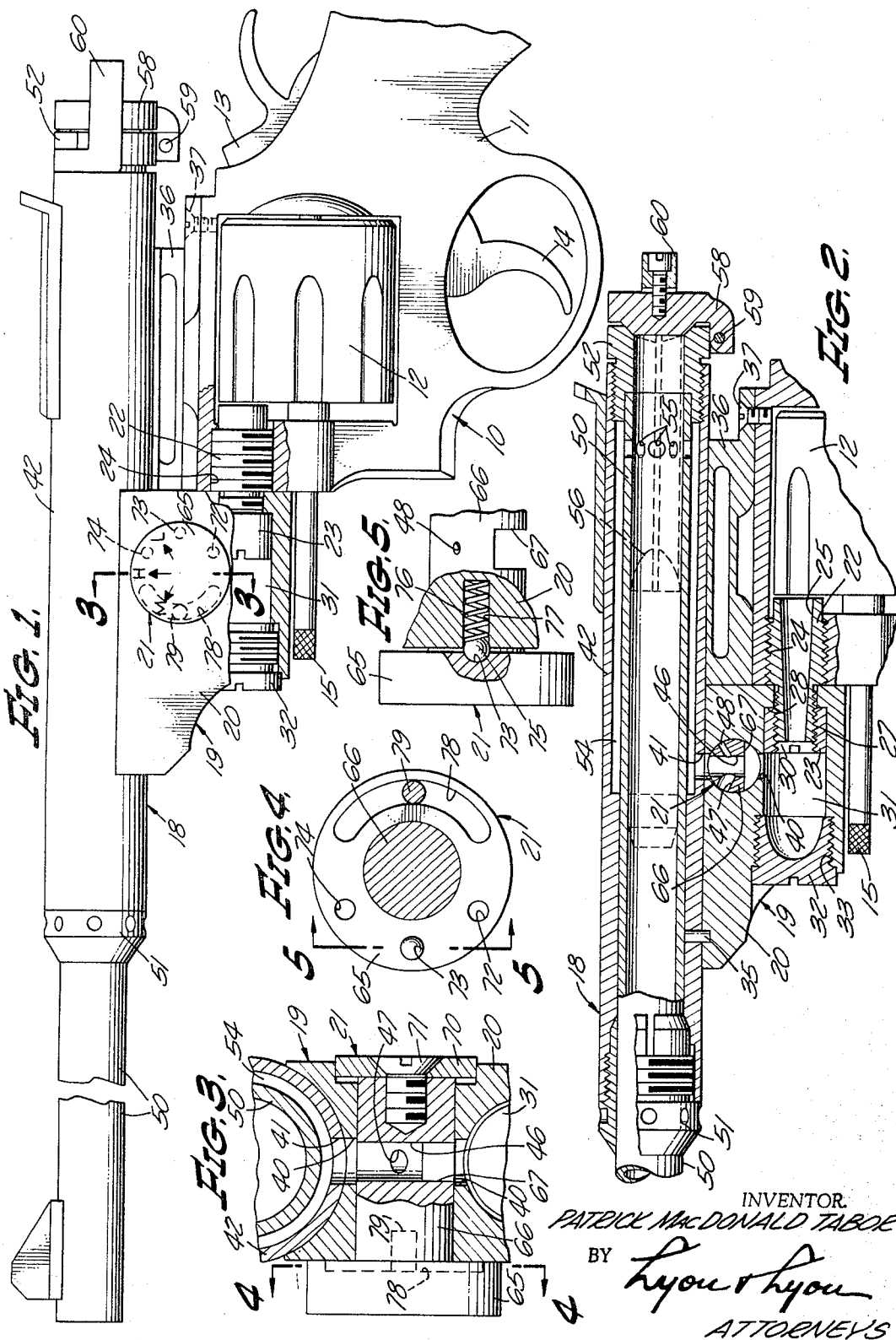
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BLANK CARTRIDGE PISTOL FOR PROPELLING PROJECTILES

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BLANK CARTRIDGE PISTOL FOR PROPELLING PROJECTILES

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5 Claims. (Cl. 42—1)

This invention relates to a weapon and more particularly to a hand-held weapon for propelling projectiles.

Various types of weapons have been devised for propelling or firing projectiles. The present invention is directed to a hand-held weapon for propelling numerous dart type projectiles principally as an aid in law enforcement and military activities, and for humane animal control. Projectiles of this nature include marking darts for identification purposes, tear gas darts, syringe or hypodermic darts, explosive darts, training darts, and so forth. Several weapons have been proposed in the past for propelling such darts, but these weapons generally have not been entirely satisfactory for one or more reasons. Exemplary forms of prior art weapons of this nature have relied upon a source of compressed air or gas resulting in short range capabilities and inaccuracies. Another prior art type device is in the form of a rifle and uses a powder actuation principle whereby the gas developed from a powder charge is regulated through an expansion chamber to give a wide range of propulsion power to enable reasonable accuracy to be maintained according to the desired range. However, such weapons generally have been bulky, cumbersome to use, complex in construction, expensive, and sometimes of limited range.

Accordingly it is an object of the present invention to provide an improved hand-held weapon for propelling dart type projectiles.

It is an additional object of this invention to provide a weapon in the form of a pistol for propelling projectiles, and which is relatively compact and simple to use.

A further object of this invention is the provision of a pistol type dart projectile weapon which is relatively easy to use and in which the pressure for propelling a dart may be varied in a simple manner.

Another object of this invention is to provide a compact hand held-type dart projectile weapon including a relatively simple and inexpensive regulating valve for selecting the propelling pressure for the projectile.

These and other objects of this invention will become more apparent upon a consideration of the following description taken in conjunction with the drawing in which:

FIGURE 1 is a side elevational view, partially in section of a hand held weapon constructed according to the concepts of this invention;

FIGURE 2 is a cross-sectional elevational view of a portion of the weapon shown in FIGURE 1;

FIGURE 3 is a cross-sectional view taken along a line 3—3 of FIGURE 1 showing a regulating valve of the weapon;

FIGURE 4 is a cross-sectional view taken along a line 4—4 of FIGURE 3; and

FIGURE 5 is a sectional view taken along a line 5—5 of FIGURE 4.

Referring now to the drawing, a hand weapon in the form of a revolver constructed in accordance with the teachings of the present invention is shown in FIGURE 1. The weapon includes essentially a conventional revolver mechanism 10 without the usual barrel. The revolver mechanism 10 includes a body 11, the stocks not being shown for simplicity of illustration, along with a conventional cylinder 12, hammer 13, trigger 14 and extractor knob 15. The cylinder 12 typically includes six

chambers for receiving cartridges. Conventional blank gas generator cartridges having a powder charge therein are used in the chambers in the cylinder 12, and each cartridge serves as a source of gas pressure for propelling a projectile as will be discussed in greater detail subsequently. Such cartridges, such as .22 caliber, are well known and extensively used in the powder actuated tool field.

The weapon further includes a barrel assembly, generally denoted by reference numeral 18 coupled by means of a block and valve body assembly 19 including a block 20 and valve 21, to the body of the revolver 10. A coupling screw 22 and nut 23 couple the body assembly 19 to the revolver 10 in place of the conventional barrel of the revolver as is better seen in FIGURE 2. The screw is threaded into the conventional barrel receiving aperture of the revolver at 24, and has a tapered bore 25 therethrough which communicates with one of the chambers in the cylinder 12. The tapered bore 25 increases the gas velocity upon firing a cartridge. Although there is a small space between the cylinder 12 and rear face of the screw 22 to allow the cylinder 12 to revolve, this has not been found to significantly degrade gas communication between the cartridge and the bore 25. The nut 23 is threaded onto the screw at 27, and seats against a flange 28 within the block 20 thereby securing the body assembly 19 to the body 11 of the revolver 10. The bore 25 in the screw 22 communicates through an aperture 30 in the nut 23 with a simple gas chamber 31 within the block 20. A gas chamber cap 32 is threaded into the block 20 at 33 to enable access to the nut 23 and to seal the chamber 31.

The body assembly 19 is aligned with the barrel assembly 18 by means of an index pin 35, and the two assemblies are secured together, as by welding. A vented rib 36 is provided as a spacer and support between the barrel assembly 18 and the body 11 of the revolver 10, and is secured to the body 11 by means of a screw 37. The block 20 has a passageway 40 therethrough communicating with an aperture 41 in an outer barrel 42 of the barrel assembly 18. The valve 21, which is a pressure selecting or metering valve, is mounted in the passageway 40 in the block 20 to meter the gas pressure from the chamber 31 to the aperture 41. As will appear subsequently, the valve 21 enables the selection of three different size orifices 46 through 48.

The barrel assembly 18 includes a barrel liner 50 which typically may be approximately twelve inches long and is secured within the outer barrel 42 by a nut 51 and a pressure cap 52. An annular gas chamber 54 is provided between the barrel liner 50 and the outer barrel 42. The barrel liner includes a plurality of radial holes 55 therethrough near the breech end thereof. Thus, it can be seen that the gas resulting from firing a cartridge communicates through the bore 25 in the screw 22, the orifice 30 in the nut 23, the gas chamber 31, one of the orifices 46 through 48 of the valve 21 in the passageway 40, the orifice 41, the annular chamber 54, and the holes 55 to the inside of the barrel liner 50. The gas can then exert sufficient propelling force on a projectile, such as a projectile 56 shown in phantom lines in the barrel liner 50. A breech cap 58 is hinged by a pin 59 to the pressure cap 52, and a breech lock handle 60 secures the cap 58 in the closed position shown in FIGURE 2 after loading the projectile into the liner 50.

The valve 21 includes a knob 65 and plug 66. A segment of the plug 66 is removed at 67, and the three orifices 46 through 48 are drilled radially through the plug. These orifices are of different diameters to enable the selection of the appropriate gas pressure to be applied to the projectile. As an example, the orifices 46 through 48 may respectively be 0.156 inch, 0.093 inch, and 0.055

inch in diameter. The smaller orifice provides a greater velocity but lower volume of gas to the projectile, which in turn shortens the range thereof. The range typically may be varied between five and sixty yards. It will be appreciated that a fewer number or a greater number of orifices having various sizes may be used.

A washer 70 and screw 71 secure the plug 66 within the block 20. A plurality of detent index holes 72 through 74 are provided in the knob 65, and a detent ball 75 and spring 76 are provided within a bore 77 in the block 20 to enable positive positioning of the valve 21. A slot 78 is provided in the knob 65, and a pin 79 affixed to the block 20 rides in this slot to limit the rotary travel of the valve.

It will be apparent that a weapon constructed in accordance with the teachings of the present invention may be easily loaded, hand held and fired, and is relatively simple to operate. A plurality of rounds may be carried by the cylinder 12 to fire a number of projectiles without the requirement of changing or reloading a gas charge, and breech loading of projectiles greatly simplifies use of the weapon.

A projectile weapon according to the present invention is particularly useful for propelling dart type projectiles of the nature of those described in copending United States patent applications Ser. No. 546,874 entitled Material Discharge Projectile and Ser. No. 546,988 entitled, Explosive Projectile, both being filed concurrently herewith by applicant.

The present embodiment of the invention is to be considered in all respects as illustrative and not restrictive, the scope thereof being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims therefore are intended to be embraced therein.

What is claimed is:

1. A hand-held weapon for propelling projectiles including a mechanism for successively firing plural explosive charges to provide gas pressure for propelling projectiles, the improvement comprising

body assembly means secured with said mechanism, said body assembly means having a bore therein for receiving gas from an exploded charge, and having a gas chamber therein communicating with said bore for receiving said gas,

gas pressure selector valve means mounted in said body assembly means and including a plurality of different size orifices communicating with said gas chamber, a barrel assembly for receiving a projectile, said barrel assembly being secured to said body assembly means and including an annular chamber therein providing a gas flow path from said gas chamber through one of said orifices in said valve means to the bore of said barrel assembly for propelling a projectile, and said valve means being operable to select any one of said orifices to change the gas pressure applied from said gas chamber through a selected orifice and said annular chamber to the bore of said barrel assembly.

2. A weapon as in claim 1 wherein

said valve means includes plug means mounted for rotation in said body assembly means and detent means for facilitating the selection of an individual

orifice, said orifices extending through said plug means to enable communication from said gas chamber to said annular chamber through a selected orifice.

3. A weapon as in claim 1 wherein

said barrel assembly includes an outer barrel secured to said body assembly means and a barrel liner coaxially mounted with respect to said outer barrel and having at least a portion within said outer barrel thereby defining said annular chamber between said liner and outer barrel,

said barrel liner being cylindrical for receiving a projectile, and having an opening therethrough communicating with said annular chamber, and

said outer barrel having an aperture communicating between said annular chamber and said valve means.

4. A weapon as in claim 3 wherein

said valve means includes plug means mounted for rotation in said body assembly means and detent means for facilitating the selection of an individual orifice, said orifices extending through said plug means to enable communication from said gas chamber to said annular chamber through a selected orifice.

5. A pistol for propelling projectiles including a mechanism for successively firing plural explosive charges to provide gas pressure for propelling projectiles, the improvement comprising

a body assembly having a gas chamber therein, screw means coupling said body assembly with said mechanism, said screw means having a bore therein for directing gas from a charge fired by said mechanism into said gas chamber,

a gas pressure selector valve including plug means mounted for rotation in said body assembly, said plug means including a plurality of different size orifices extending therethrough and selectively communicating with said gas chamber, said valve further including detent means for facilitating positive positioning of said plug means and selection of an individual orifice,

a barrel assembly including an outer barrel secured to said body assembly and a barrel liner coaxially mounted with respect to said outer barrel and having at least a portion within said outer barrel thereby defining an annular chamber within said barrel assembly between said liner and said outer barrel, said outer barrel having an aperture communicating between said annular chamber and said valve means for enabling gas communication between said gas chamber and said annular chamber through a selected orifice, and

said barrel liner including a bore therethrough for receiving a projectile, and having a plurality of openings through the wall thereof communicating with said annular chamber for providing a gas flow path from said annular chamber to propel a projectile within said barrel liner.

No references cited.

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