March 7, 1967 W. C. COX 3,307,283

FIREARM GRENADE LAUNCHER

Filed Sept. 29, 1965

FIG. 1

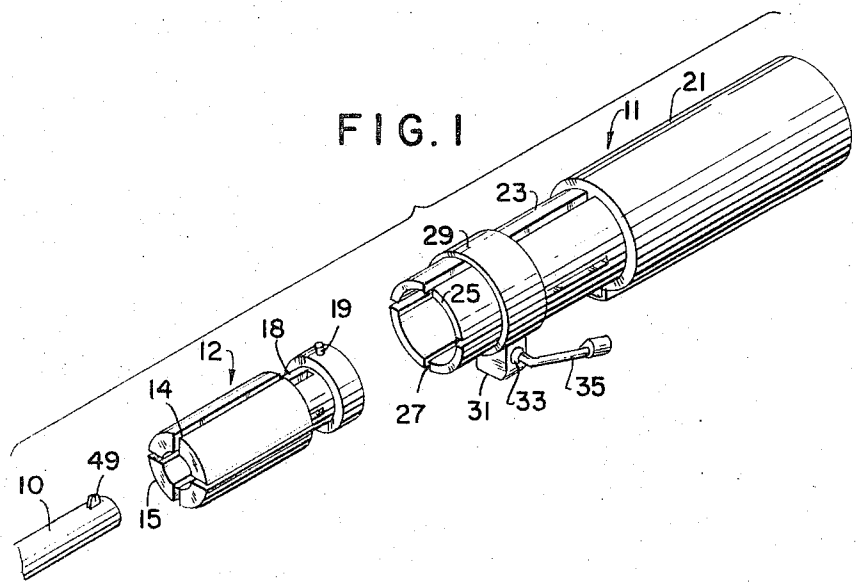
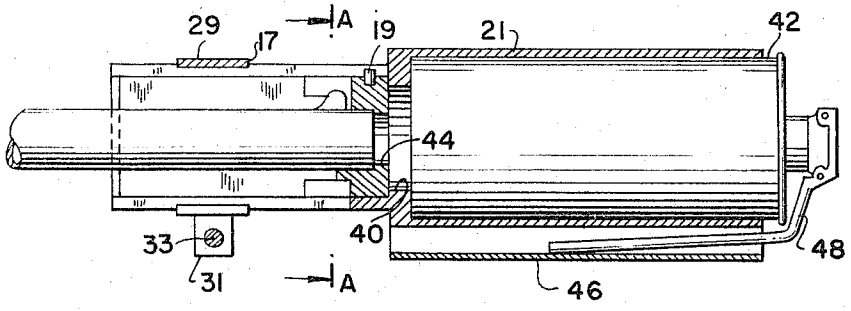


FIG. 2



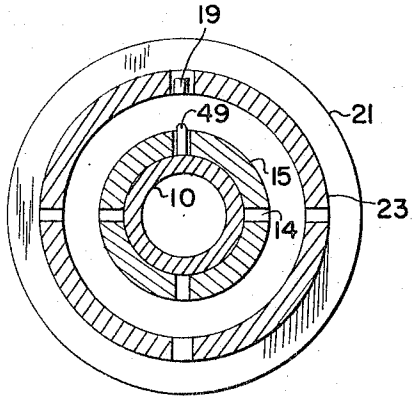


FIG. 3

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FIREARM GRENADE LAUNCHER

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This invention relates to a projectile launcher for mounting upon the barrel of a conventional firearm and, more particularly, to a launcher of grenades which is readily adaptable for mounting upon firearms of various calibers.

In prior years, the utilization of grenades has normally been limited to the military during warfare and, therefore, grenade launchers for rifles have generally been specifically designed in conjunction with a particular military weapon then employed by the combat forces and often utilize a particular feature not found in non-military weapons, e.g., a bayonet lug, to secure the launcher to the firearm. The military grenade launchers, however, are deficient in that they cannot normally function with hand grenades but require special rifle grenades having an elongated tubular handle for proper operation.

In recent years with the advent of more sophisticated and diversified forms of gases, civilian police forces have been utilizing gases, with ever increasing frequency, to deal with disorders and to combat crime. Because the civilian forces, particularly in small communities, are limited in the number and versatility of the weapons at their command, a gas grenade launcher which can be adapted rapidly and easily for utilization with various caliber civilian firearms greatly increases the flexibility of the weaponry at their disposal.

It is therefore an object of this invention to provide a gas grenade launcher which is readily convertible for employment with civilian firearms of diverse caliber.

It is also an object of this invention to provide a gas grenade launcher in which there is no necessity for utilization of grenades of a specialized nature thereby reducing the variety and cost of stock material necessary for proper operation of a police force.

It is a further object of this invention to provide a grenade launcher which is simple and rugged in construction, easy to manufacture and positive in operation.

These and other objects of this invention are attained by a grenade launcher of unitary construction having a hollow cylindrically shaped muzzle mounting rearward section of resilient material which is split into a plurality of arcual sections by a similar number of longitudinal slots extending a majority of the length of the section and intersecting its rearward end. The arcual sections are retained in position relative to each other by a circular junction formed by the cylindrical body of the muzzle mounting section forward of the termination points of the longitudinal slots. The internal diameter of the circular configuration formed by the arcual sections is of slightly greater dimension than the outside diameter of the barrel of the firearms and the width of the slots is greater than the thickness of the forward sights of the firearm so that the barrel of the firearm can be snugly received within the muzzle mounting section with the forward sights interposed within a slot between two arcual sections.

Circumferentially mounted about the arcual sections remote from their point of juncture are contraction means having sufficient mechanical advantage that hand operation will securely compress the arcual sections about the muzzle of the firearm. An annular shoulder formed internally at the forward end of the muzzle mounting section forms an abutment for seating the muzzle of the firearm and limiting the forward travel of the barrel

within the mounting section. The longitudinal slot into which the forward sight of the firearm is inserted extends sufficiently into the muzzle mounting section such that the forward sight of the firearm will not limit the forward travel of the firearm muzzle and the muzzle can seat on the shoulder. The muzzle mounting section of the launcher can have a diameter slightly larger than the muzzle diameters of firearms designed for from 22 caliber to 37 millimeter ammunition.

In order that this grenade launcher can be utilized with firearms of various caliber, however, tubular shaped adapters are provided for slidable insertion within the muzzle mounting section effectively to reduce the internal diameter of the mounting section to slightly greater than the outside diameter of the particular firearm to which it is being attached. Each adapter is similar in physical configuration to the muzzle mounting section and is longitudinally cut by a plurality of slots along a majority of its length which slots extend to and intersect the rearward end of the adapter while a shoulder is provided internally at its forward end against which the muzzle of the gun abuts. Similarly, the longitudinal slot into which the forward sight of the firearm is inserted extends sufficiently into the adapter such that the forward sight of the firearm will not limit the travel of the firearm muzzle and the muzzle can seat on the shoulder of the adapter. In this manner, by a mere interchange of adapters, any firearm having a cylindrically shaped barrel may be utilized to provide the propelling force to the base of the grenade necessary to project it forward.

The forward end of the adapter is inserted within the muzzle mounting section until its forward end seats upon the annular shoulder formed internally within the mounting section and the force of the contraction means mounted circumferentially about the muzzle mounting section is sufficient snugly to compress the adapter about the muzzle of the firearm inserted therein without any additional contractural provisions.

In order that conventional hand gas grenades can be used with the launcher of this invention, an elongated hollow cylindrically shaped projectile seating section is formed forward and in coaxial position with the muzzle mounting section. The internal diameter of the projectile seating section is of very slightly greater dimension than the outer diameter of a conventional cylinder type gas grenade so that the force of the expanding gases of the propellant cartridge is imparted directly to the circular base of the cylindrical grenade thereby projecting the grenade forwardly with a minimum of seepage of the propelling gases about the grenade. The elongated, cylindrical shape of the projectile seating section assists in controlling the stability of flight of the grenade as well as imparting a greater distance of flight by maintaining the propelling gases at the base of the grenade for a longer period of time than is afforded by conically shaped short grenade seats.

A more complete understanding of this invention may be obtained from a description of the preferred embodiment as shown in the appended drawings in which:

FIGURE 1 is an exploded view of the grenade launcher and adapter of this invention;

FIGURE 2 is a sectional view of the grenade launcher and adapter of this invention mounted upon the barrel of a firearm; and

FIGURE 3 is a sectional view taken along plane A—A of FIGURE 2.

Referring more particularly to FIGURE 1, the tubular muzzle **10** of a small caliber firearm, such as a 30 caliber rifle, is prepared for accommodation within grenade launcher **11** by an adapter **12** which is employed to effectively increase the outside diameter of muzzle **10** with re-

spect to launcher 11. Adapter 12 is tubular shaped and preferably fabricated from a unitary piece of resilient material, e.g., stainless steel, in order to provide both the resiliency and strength necessary for its proper functioning. Four longitudinal slots 14 extending a majority of the length of adapter 12 and intersecting its rearward end 15 remote from launcher 11 dissect the adapter into four arcual sections which terminate in a circular juncture intermediate groove 18. The width of slots 14 is so dimensioned that the forward sight 49 of muzzle 10 can be slidably received therein while permitting sufficient contractual movement of arcual sections 15 to snugly compress adapter 12 about muzzle 10. Groove 18 which is positioned in the forward portion of adapter 11 and extends to a depth of approximately one half the thickness of the tubular section is provided to produce a greater flexibility of movement of arcual section 15 in response to a compressive pressure applied to the rearward end. A forward guide 19 protruding upwardly from adapter 11 at its forward end directs the adapter into position within a slot 27 of muzzle mounting section 21 of launcher 11 so that the arcual sections of adapter 12 and launcher 11 are in alignment.

Launcher 11 is of unitary construction fabricated from resilient material and includes hollow cylindrically shaped grenade seating section 21 and a hollow cylindrically shaped muzzle mounting section 23 in coaxial position with grenade seating section 21. Muzzle mounting section 23 is similar in construction to adapter 12 and is disected into four arcual sections 25 by four transverse slots 27 which extend the majority of the length of section 23 and intersect its rearward end remote from its juncture with grenade seating section 21. The width of slots 27 between arcual sections 25 is of sufficient dimension to accept guide 19.

A split flexible steel hose clamp 29 positioned within groove 17 circumferentially embraces arcual sections 25 along their length remote from seating section 21 and is provided at its extremities with right hand and left hand threaded terminals 31 through which is axially passed threaded rod 33. An angularly shaped handle 35 is securely jointed to one end of rod 33 and is of such a length relative to the pitch of the threads of rod 33 that finger pressure alone can contract the circular configuration formed by arcuate sections 25 and 14, respectively, to securely fasten launcher 11 to muzzle 10 through adapter 12. Preferably the pitch of the threads of rod 33 are such that a rotation of approximately 120° of handle 35 will produce the contractual pressure necessary to fixedly secure all parts.

As can be more clearly seen in FIGURE 2, an annular shoulder 40 is formed interiorly of muzzle mounting section 23 at its point of juncture with grenade seating section 21 and serves as an abutment against which the forward end of adapter 10 may rest while providing a seat for the base of cylindrically shaped gas grenade 42. A second annular shoulder 44 having a height equal to the thickness of the wall of muzzle 10 acts to limit the axial travel of muzzle 10 within adapter 12 as well as adding slightly to the effective length of the barrel of the firearm. The flush seating betwen muzzle 10 and shoulder 44 at adapter 12 and between shoulder 44 and shoulder 40 of launcher 11 prevent any possible escape of expanding gases from muzzle 10 upon discharge of the firearm through slots 14 and 27 respectively. A channel 46 fixedly attached to the exterior of grenade seating section 42 provides a housing to retain safety lever 48 depressed after the safety pin has been removed from the grenade.

Referring to FIGURE 3, the coaxial position of muzzle 10, adapter 12 and launcher 11 permit the fixing of ball ammunition from the firearm after the grenade has been launched without the necessity for any alteration in position or removal of the launcher from the muzzle.

Because of the minimum number of parts employed in the construction of this adapter and grenade launcher as well as the relatively simple and readily produced tubular design of the component parts, a far greater economy in the manufacture of adapters in accordance with this invention can be realized over the complex adapters of the prior art.

In operation, muzzle 10 is slidably received within adapter 12 with its front sight 49 within slot 14 until the muzzle abuts shoulder 44 and adapter 12 is then inserted within muzzle mounting section 23 with guide 19 within one of slots 27 until the forward edge of adapter 12 is seated upon annular shoulder 40 formed interiorly of muzzle mounting section 23 at its point of juncture with grenade seating section 21. Handle 34 is then rotated clockwise to apply a compressive force upon arcual sections 25 and 15, respectively, thereby locking launcher 11 to muzzle 10 through adapter 12. Grenade 42 is subsequently inserted within grenade seating section 21 with safety handle 48 positioned within channel 46. When the safety pin is removed from the grenade and the firearm loaded with blank ammunition the grenade is ready for launching.

The close tolerance between the diameter of grenade 42 and seating section 21 limits the seepage of expanding gases from the discharged blank ammunition while the elongated length of seating section 21 controls the stability of grenade 42 in flght. When the forward propulsion of the grenade removes safety lever 48 from channel 46 in its initial stage of flight, the spring actuation of lever 48 operates an internally constructed striker to fire grenade 42 in the conventional manner. If desired, a round of ball ammunition can be subsequently fired without removal or alteration of launcher 21.

What is claimed is:

1. A projectile launcher for mounting on the barrel of a firearm comprising

(i) an elongated cylindrically-shaped projectile seating forward section,

(ii) a cylindrically-shaped muzzle mounting rearward section of resilient material fixedly jointed to and in coaxial position with said projectile seating section,

(iii) a plurality of narrow longitudinal slots extending a majority of the length of said muzzle mounting section and intersecting the end of said muzzle mounting section remote from its junction point with said projectile seating section,

(iv) an annular shoulder located interiorly of said muzzle mounting section at its junction point with said projectile seating section,

(v) a split strap externally mounted circumferentially about the rearward portion of said muzzle mounting section,

(vi) adjustment means fixedly joined to said split strap to vary its diameter thereby altering the diameter of said muzzle mounting section along its length, and

(vii) means externally mounted upon said projectile seating section to retain said projectile in its deactivated position until launch.

2. A projectile launcher for mounting on the barrel of a firearm comprising

(i) an elongated cylindrically-shaped projectile seating forward section,

(ii) a cylindrically-shaped muzzle mounting rearward section of resilient material fixedly jointed to and in coaxial position with said projectile seating section,

(iii) a plurality of narrow longitudinal slots extending a majority of the length of said muzzle mounting section and intersecting the end of said muzzle mounting section remote from its junction point with said projectile seating section,

(iv) an annular shoulder located interiorly of said muzzle mounting section at its junction point with said projectile seating section,

(v) a split strap externally mounted circumferentially about the rearward portion of said muzzle mounting section,

(vi) adjustment means fixedly joined to said split strap to vary its diameter thereby altering the diameter of said muzzle mounting section along its length,

(vii) means externally mounted upon said projectile seating section to retain said projectile in its deactivated position until launch,

(viii) an elongated, tubular shaped adapter for resilient material slidably received within said muzzle mounting section so that the forward end of said adapter is seated upon the annular shoulder of said muzzle mounting section,

(ix) an annular shoulder located interiorly of said tubular adapter at its forward end, and

(x) a plurality of longitudinal slots extending the majority of the length of said adapter and intersecting its rearward end remote from said annular shoulder of said adapter, the width of said slots being such that the forward sights of a firearm can be slidably received therein.

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BENJAMIN A. BORCHELT, *Primary Examiner.*