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Rocha

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[54] **TELESCOPING AMMUNITION LAUNCHER**

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[73] Assignee: **The United States of America as represented by the Secretary of the Army,** Washington, D.C.

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[21] Appl. No.: **82,656**

[52] **U.S. Cl.** **89/1.7,** 89/1.705, 89/1.816, 89/1.817

[51] **Int. Cl.** **F41f 3/02**

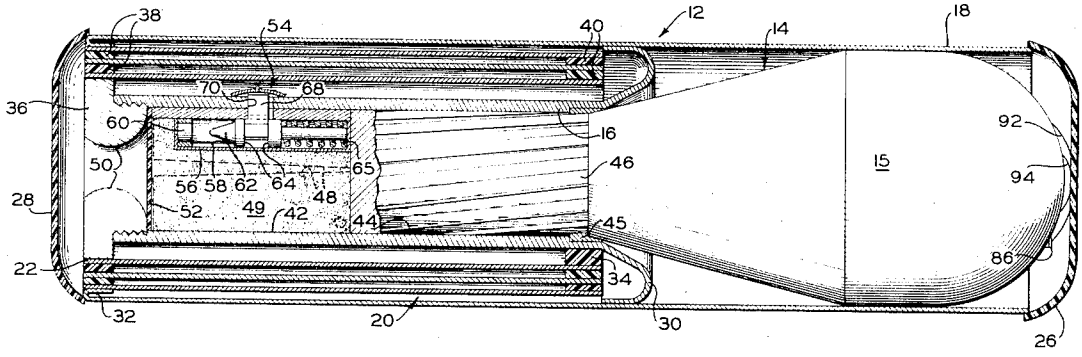
[58] **Field of Search** 89/1, 1.3, 1.7, 41.6, 89/41.61, 41.62; 33/48; 42/1, 15

Primary Examiner—Samuel W. Engle
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EXEMPLARY CLAIM

1. A telescopic firearm including a firing tube for the discharge of a projectile, a blast deflector, a flash deflector for receiving said firing tube and blast deflector when telescoped thereinto, covers mounted by hinges on said flash deflector for closing the ends thereof, and a sight system incorporated in said covers.

8 Claims, 9 Drawing Figures

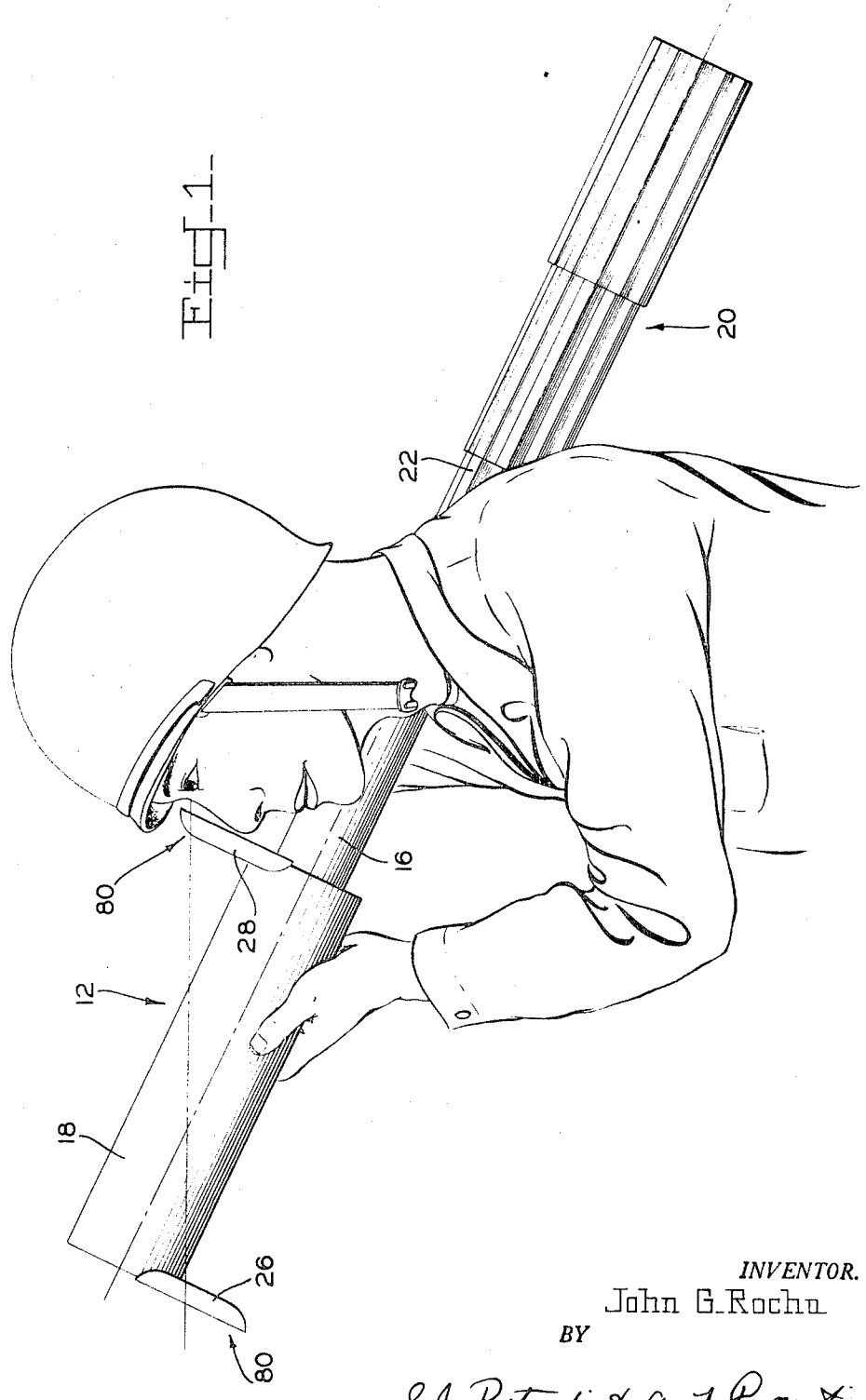


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SHEET 1 OF 4

Fig. 1



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SHEET 2 OF 4

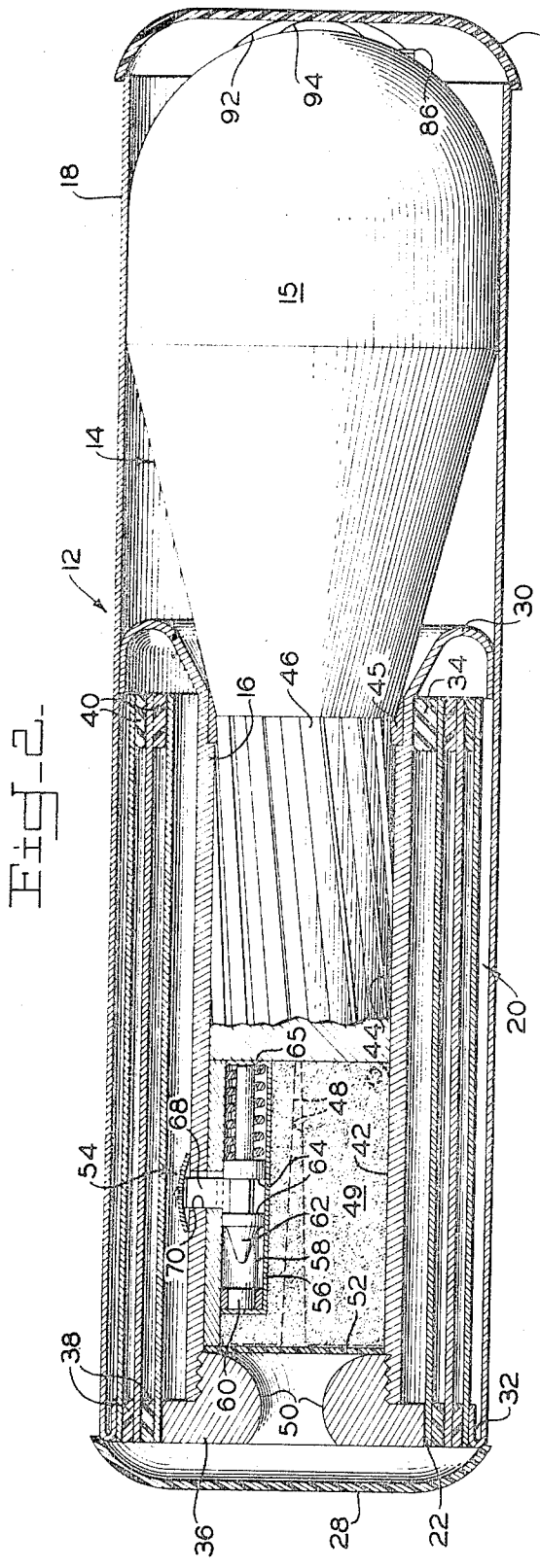


Fig-2-

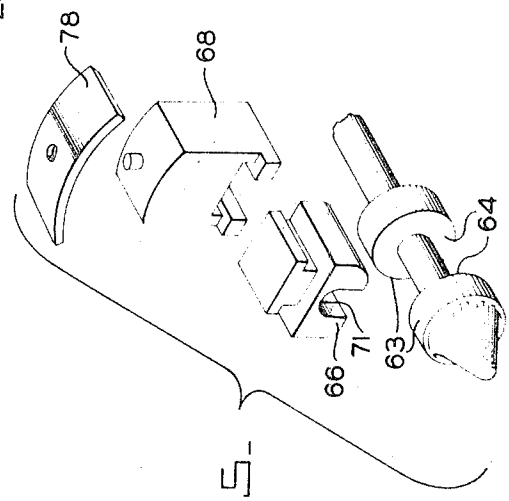


Fig-5-

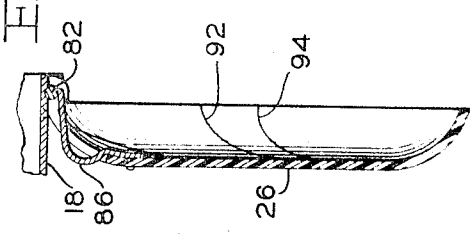


Fig-4-

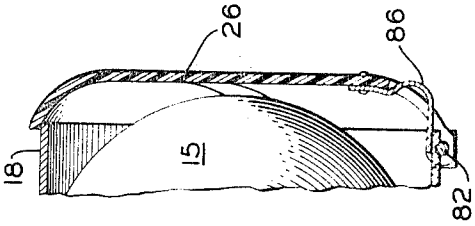


Fig-3-

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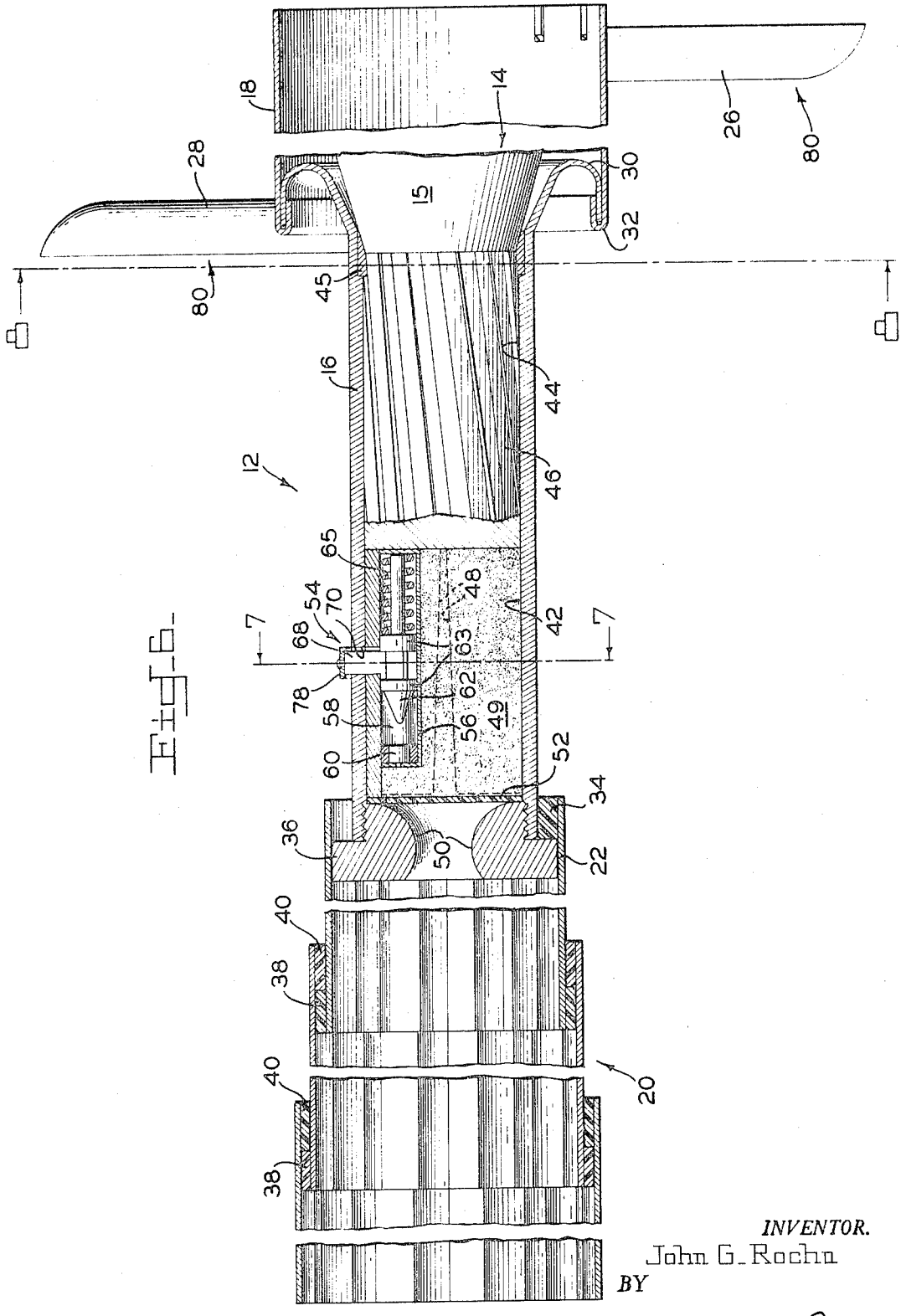


Fig. 6

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Fig. 7

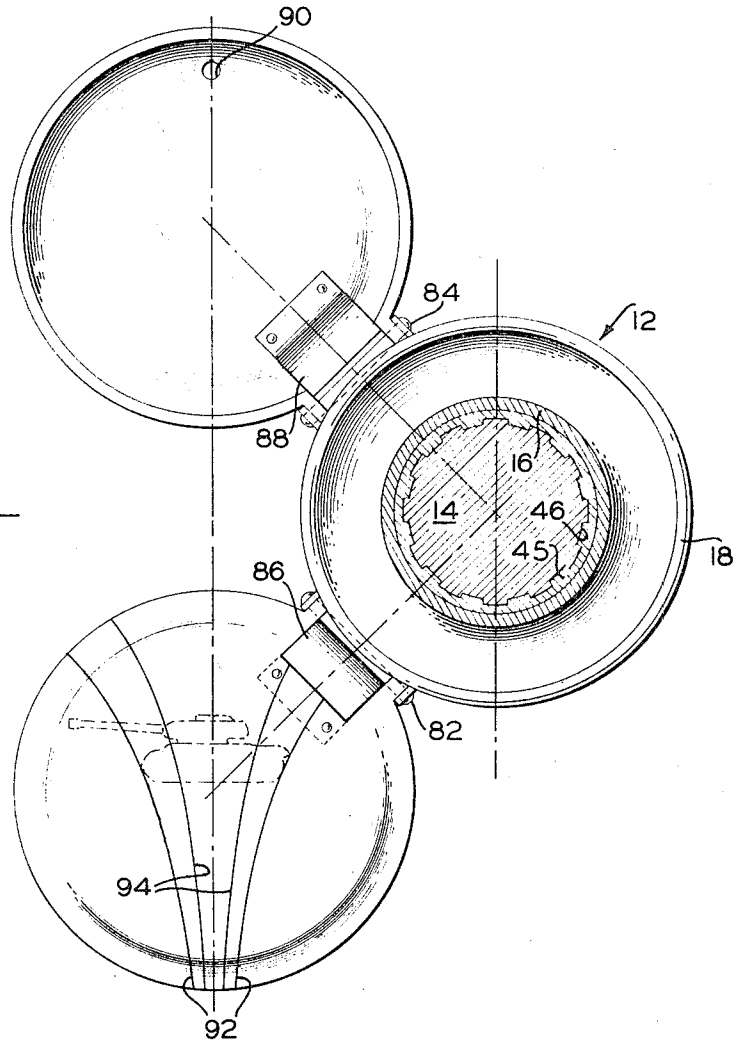


Fig. 8

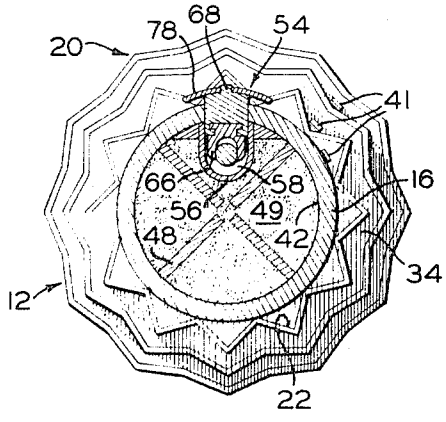
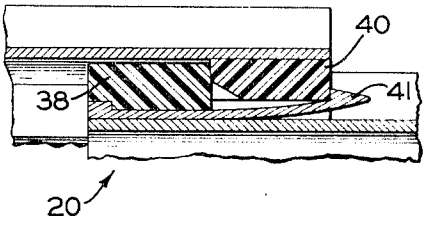


Fig. 9



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TELESCOPING AMMUNITION LAUNCHER

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to recoilless firearms and more particularly to recoilless launchers of shells.

It is one object of this invention to provide for infantry troops a supplemental sidearm having artillery capability at pistol weight.

It is another object of this invention to provide such a firearm which may be hand held when fired by being virtually recoilless.

It is a further object of this invention to provide such a firearm which is compact as to size, so that it may be carried as a sidearm, is inexpensive to manufacture, so as to be expendable, and is simple yet positive in design.

It is a still further object of this invention to provide such a firearm which consists of a firing tube and two or more flash and blast deflector sections which may be telescoped into a small size for carrying with the forward flash deflector acting as a casing for the weapon when telescoped.

It is still another object of this invention to provide such a firearm wherein the flash deflector is closed at the ends by covers which are hinged thereto and which incorporate the sighting device of the weapon.

It is still another object of this invention to provide such a firearm wherein the trigger mechanism is covered by the blast deflector when telescoped over the firing tube.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawings in which:

FIG. 1 shows the firearm extended and being aimed at a target;

FIG. 2 is a longitudinally cross-sectioned view of the firearm shown telescoped;

FIG. 3 is a cross-sectional view of the front cover taken through the mounting hinge;

FIG. 4 is a cross-sectioned view of the rear cover taken through the mounting hinge;

FIG. 5 is an exploded perspective view of the firing mechanism;

FIG. 6 is a longitudinally cross-sectioned view of the firearm shown extended;

FIG. 7 is a view taken along line 7—7 of FIG. 6;

FIG. 8 is a view taken along line 8—8 of FIG. 6; and

FIG. 9 is an enlarged cross-sectioned view of the latch for releasably holding the sections of the firearm extended.

Shown in the figures is a firearm **12** which is adapted for firing a 75mm projectile **14** carrying a warhead **15** and which includes in telescopic arrangement a firing tube **16**, a flash deflector **18**, and a blast deflector **20** composed of three telescopic sections including an inner section **22**. When firearm **12** is fully telescoped, firing tube **16** and blast deflector **20** are nested within flash deflector **18** which acts as a casing therefor and the ends of the flash deflector are respectively closed by a front cover **26** and a rear cover **28** which are hingedly mounted on the flash deflector as hereinafter described. Front cover **26** and rear cover **28** are semielliptical in shape for added strength and are fabricated from transparent plastic material for a reason noted

hereinafter. When extended, firearm has a length of about 30 inches and, when telescoped, is approximately 10½ inches long.

The front end of firing tube **16** is rolled back over the outside thereof, as noted at **30**, to form a bearing surface for slidingly supporting flash deflector **18** so as to be extendable forwardly relative to the firing tube. The rear end of flash deflector **18** is rolled back inwardly, as noted at **32**, so as to be receivable by rolled end **30** of firing tube **16** to limit the extension of the flash deflector relative thereto.

The sections of blast deflector **20** are corrugated longitudinally along the entire lengths hereof for added structural strength so as to be radially expandable to relieve any excessive gas pressure in event the blast deflector should be plugged by dirt or other obstruction when firearm **12** is discharged. Provided inside of inner section **22** at the front end thereof is a ring **34** the inside diameter of which is the same as the outside diameter of firing tube **16** so as to have sliding contact therewith, and such ring is contactable with a collar **36** provided on the outside of the rear end of the firing tube **16** to limit the rearward displacement of the inner section relative thereto. An external collar **38** and an internal ring **40** are provided respectively on the rear and front ends of each of the sections of blast deflector **20** to limit the extension of the sections and such sections and flash deflector **18** are releasably held extended by spring latches **41** as best shown in FIG. **9**.

Firing tube **16** is provided with a combustion chamber **42** in the rear portion and a launching section **44** in the front portion. The rear portion of projectile **14** is received by launching section **44** with warhead **15** extending forwardly therefrom. Flash deflector **18** is sufficiently longer than firing tube **16** to inclose warhead **15** when the flash deflector is telescoped over the firing tube.

A rifled rotating band **45** is provided at the front end of launching section **44** to mate with pre-engraved grooves **46** on the rear portion of projectile **14** for spinning the projectile when propelled from the launching section. Four stabilizing fins **48** are hingedly mounted on the rear end of projectile **14** and such fins are folded up to be received by combustion chamber **42**. The spin of projectile **14** by rotating band **45** causes fins **48** to open, according to conventional design, as the projectile leaves firing tube **16**. Projectile **14** is propelled into flight by a propellant **49** which is packed in combustion chamber **42** around fins **48** at the rear end of the projectile. Provided in the rear end of firing tube **16** is a venturi **50** which permits the rearward escape of a predetermined amount of the exploded gases therethrough, when propellant **49** is ignited, for counteracting the recoil forces produced in firearm **12** by the ignition. The rear end of firing tube **16** is sealed forwardly of venturi **50** by a rupture disc **52** which holds propellant **49** in combustion chamber **42** and aids ignition of the propellant. Rupture disc **52** is preferably fabricated from plastic material which is completely disintegrated when propellant **49** is ignited, to reduce the hazard of the disc becoming a secondary missile.

Propellant **49** is ignited by a firing mechanism **54** which includes a housing **56** fixed to the inside of combustion chamber **42**. Housing **56** is U-shaped in cross-section with an opening **58** therethrough and is longitudinally disposed so as to be straddled by one pair of the fins **48** and so that the rear end of housing **56** is spaced

from rupture disc 52. Provided at the rear end of opening 58 is a primer 60 which, when initiated, ignites propellant 49.

Primer 60 is initiated by a firing pin 62 which is slidingly disposed in opening 58 and which is provided with a pair of longitudinally spaced collars 63 which form a channel 64. Firing pin 62 is biased rearwardly for striking primer 60 by a coil spring 65 which is disposed between the rear end of housing 56 and the front one of the collars. Firing pin 62 is releasably held in a cocked position by a sear 66 which is actuatable to release the firing pin by a trigger 68 slidingly received by a radial hole 70 of rectangular cross-section through the wall of firing tube 16. Sear 66 is received between the collars 63 and is provided with a longitudinal recess 71 along the underside to receive the axial section of channel 64. Whereby vertical displacement of sear 66 is permitted between a firing pin holding position wherein the sear is extended upwardly to be partially received by hole 70 and a firing pin release position wherein the sear is entirely received by opening 58.

Provided along the top of sear 66 is a T-flange 72 which is longitudinally disposed and which is received by a mating T-slot 74 in the bottom of trigger 68 whereby the sear and trigger are locked together to prevent relative vertical displacement yet permit the sear to be displaced rearwardly, relative to the trigger, when actuated to the firing pin release position. The rear end of sear 66 is cut away at the upper portion to form a pair of rearwardly projecting lips 76 which are extendable rearwardly under the wall of firing tube 16 to prevent outer displacement of the sear and, consequently, trigger 68 which is locked thereto. Lips 76 are held under the wall of firing tube 16 through the rearward bias of firing pin 62, which is transferred to sear 66 through the contact of the forward one of the collars 63 therewith.

An elongated firing button 78 is rotatably mounted on the external end of trigger 68 and such button is arcuately formed to the same diameter as the outside of firing tube 16. Whereby, when button 78 is longitudinally disposed in a "safe" position as shown in FIG. 2, the ends thereof contact the outside of firing tube 16 to prevent depression of trigger 68 and, when the button is transversely disposed to a "fire" position, as shown in FIG. 8, it is spaced throughout from the outside of the firing tube so that, when the button is depressed, the trigger is displaced for actuating sear 66 to the firing pin release position.

Housing 56 and blast deflector 20 are so related that button 78 is straddled by a pair of the corrugations of inner section 22 when the button is in the safe position and the inner section is telescoped thereover. Thus, button 78 is protectingly covered and is held against rotation to the "fire" position until blast deflector 20 is fully extended to the ready-to-fire position.

Front cover 26 and rear cover 28 cooperate to form a sighting device 80 when they are swung open 180° on hinges 82 and 84 provided respectively therefor. Hinges 82 and 84 are provided respectively with cooperating springs 86 and 88 which are disposed so as to hold the covers 26 and 28 in either the closed position, wherein the ends of flash deflector 18 are closed thereby, or the open position wherein the covers are positioned to form sighting device 80.

Covers 26 and 28 are mounted on flash deflector 18 so that, when disposed in the sighting position thereof, a planc coincident with the longitudinal axis of the flash deflector and intersecting the center of front cover 26 is right angular to a plane coincident with the longitudinal axis of the flash deflector and intersecting the center of rear cover 28. Whereby, the sighting plane of sighting device 80 intersecting the centers of both the covers 26 and 28 is unobstructed by flash deflector 18 as is clearly shown in FIG. 7.

Sighting device 80 includes a rear sight reference reticle 90 inscribed as a circle on rear cover 28 and a first pair of graduated lines 92 and a second pair of graduated lines 94 inscribed on front cover 26 as hereinafter described. Reference reticle 90 is located in rear cover 28 adjacent the perimeter thereof and in an extension of the longitudinal plane intersecting the centers of rear cover 28 and front cover 26 and the pairs of graduated lines 92 and 94 are symmetrical to such plane as shown in FIG. 7. Firearm 12 is adapted for use against tanks and, therefore, lines 92 are graduated so that, when a tank target is broadside and the front and rear ends of the tank touch both of the lines as shown in phantom in FIG. 7, the firearm is correctly elevated for the range. The lines 94 are graduated for finding the range when the front or rear end of a tank is the target.

Thus, firearm 12, which when collapsed is only 10½ inches long, may be easily carried as a sidearm by infantry troops and it is easily fired by hand, although carrying an anti-tank projectile of artillery capabilities, because of its recoilless operation. Firearm 12 is quickly readied for firing by opening covers 26 and 28 and extending flash deflector 18 and blast deflector 20. When blast deflector 20 is fully extended, button 78 is uncovered and released so that it may be rotated from the "safe" to the "fire" position. If firearm 12 is not discharged after extension to the ready-to-fire position, it may be made safe by telescoping inner section 22 over firing tube 16 sufficiently to cover and protect button 78 after the button is rotated to the "safe" position thereof.

When firearm 12 is fired, button 78 is depressed to move sear 66 to the firing pin release position wherein the sear is completely received by opening 58 and thereby firing pin 62 is freed to strike primer 60 with the sear being carried forwardly by the firing pin in such opening.

Firearm 12 is sighted on its target by rotating it until rear sight reticle 90 and the graduated lines 92 and 94 are in vertical relationship, as shown in FIG. 7, and then the elevation of the firearm is varied until the tank target is positioned between either the graduated lines 92, if the tank is broadside, or graduated lines 94, if the target is at the front or rear end of the tank. Thus, firearm 12 is correctly elevated to lob projectile 14 onto the target. By covers 26 and 28 being fabricated from transparent plastic material, the operator always has visual contact with the target as the sighting members can never obstruct the operator's view.

From the foregoing it is clearly apparent that there is provided herein an effective firearm which has artillery capabilities but which may be carried as a sidearm by its compact construction wherein the covers act as the sighting elements and the telescopic parts provides a safety for the trigger.

Although a particular embodiment of the invention has been described in detail herein, it is evident that many variations may be devised within the spirit and

scope thereof and the following claims are intended to include such variations.

I claim:

1. A telescopic firearm including a firing tube for the discharge of a projectile, a blast deflector, a flash deflector for receiving said firing tube and blast deflector when telescoped thereinto, covers mounted by hinges on said flash deflector for closing the ends thereof, and a sight system incorporated in said covers.

2. The firearm as defined in claim 1 wherein said blast deflector is composed of a plurality of telescopic sections which are corrugated longitudinally for added strength and to relieve any excessive gas pressure produced therein.

3. The firearm as defined in claim 1 wherein said firing tube is provided with a firing mechanism including a trigger extending radially through said firing tube and said blast deflector is provided with longitudinal corrugations which when said blast deflector is partially telescoped on said firing tube straddles said trigger to prevent actuation thereof.

4. The firearm as defined in claim 1 wherein said firing tube is provided with a firing mechanism including a trigger extending radially through said firing tube and an actuating button rotatingly mounted on the outside of said trigger, said button being arcuately formed according to the radius of said firing tube so that when said button is disposed longitudinally, respective to said firing tube, said trigger is held against actuation through the contact of the ends of said button with the outside of said firing tube and when said button is rotated so as to be transversely disposed said trigger is freed for actuation, and wherein said blast deflector is provided with longitudinal corrugations disposed so as to straddle said button when longitudinally disposed and said blast deflector is partially telescoped to prevent rotation thereof from the longitudinal position and to guard said button against accidental actuation.

5. The firearm as defined in claim 1 wherein said sight system is established when said front and rear covers are swung open 180°.

6. The firearm as defined in claim 1 wherein said front and rear covers are fabricaed from transparent material and said sight system includes a circlar reicle inscribed in said rear cover and pairs of graduated lines inscribed in said front cover, said graduated lines being arranged to indicate the elevation of the firearm according to the distance of a target relative thereto.

7. The firearm as defined in claim 1 wherein said hinges are mounted on said flash deflector 90° apart and said hinges permit pivotal displacement of said front and rear covers 180° to an open position for establishing said sight system.

8. The firearm as defined in claim 7 wherein a circular reticle is inscribed on said rear cover adjacent the perimeter thereof and pairs of graduated lines are inscribed on said front cover to indicate the elevation of the firearm according to the distance of a target therefrom and wherein said reticle is located in a geometric plane passing through the longitudinal axis of said front and rear sights and said graduated lines are disposed symmetrically to such geometric plane.

* * * * *