July 7, 1964 C. A. SELLERS ETAL 3,139,692

CARTRIDGE POWERED SPEAR GUN

Filed March 14, 1963

2 Sheets-Sheet 1

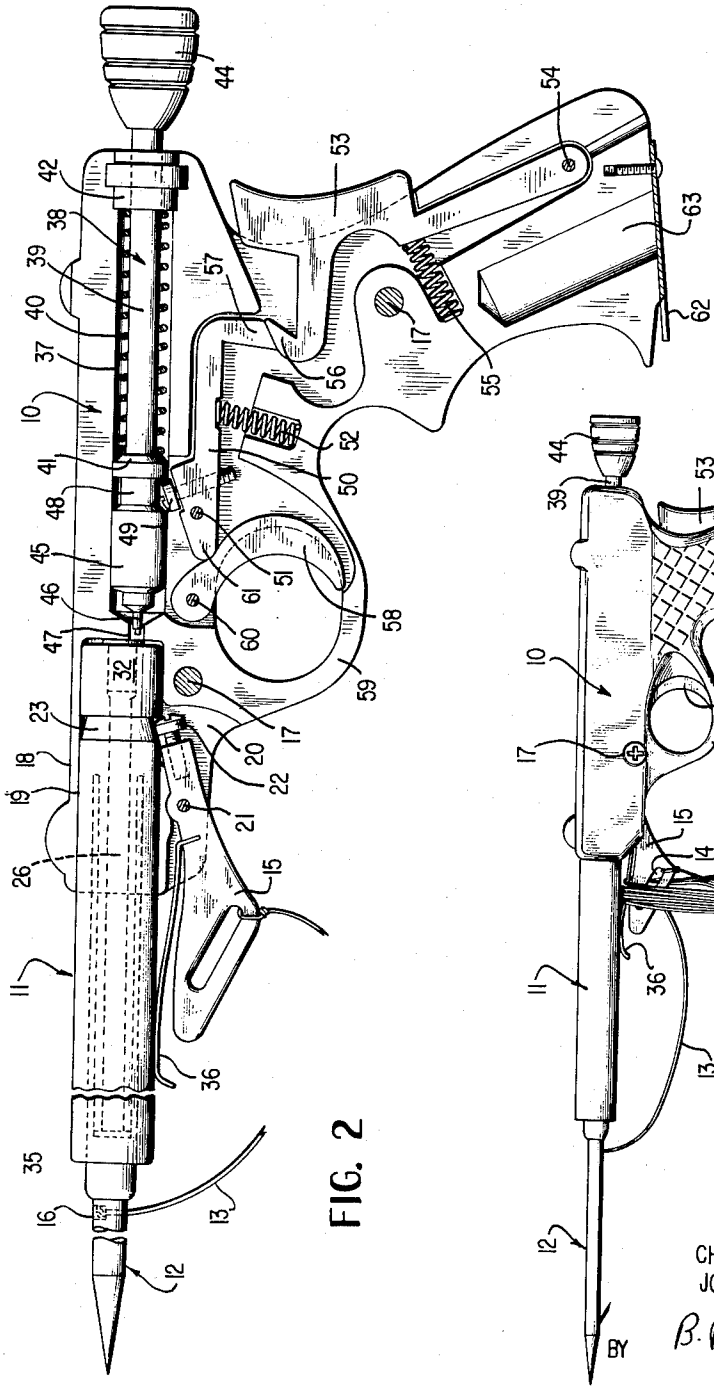


FIG. 2

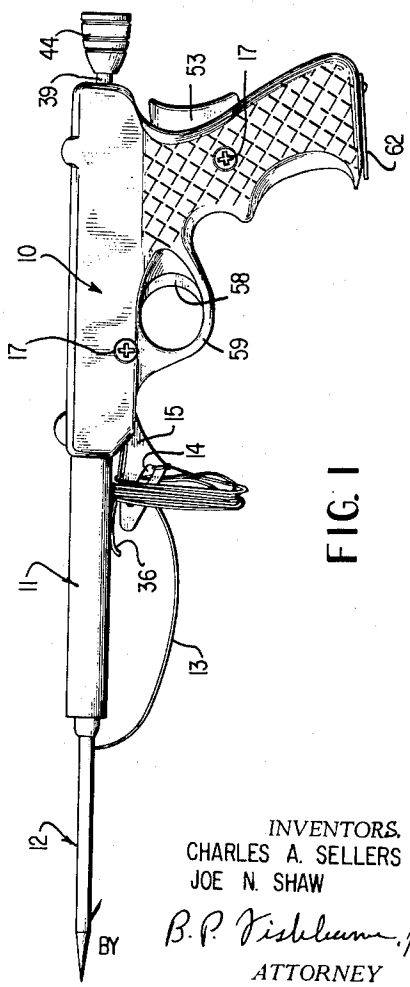


FIG. 1

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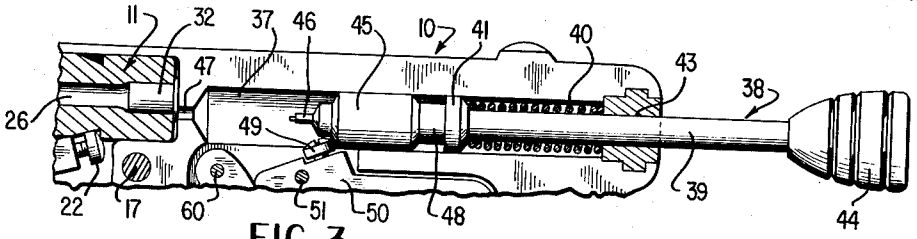


FIG. 3

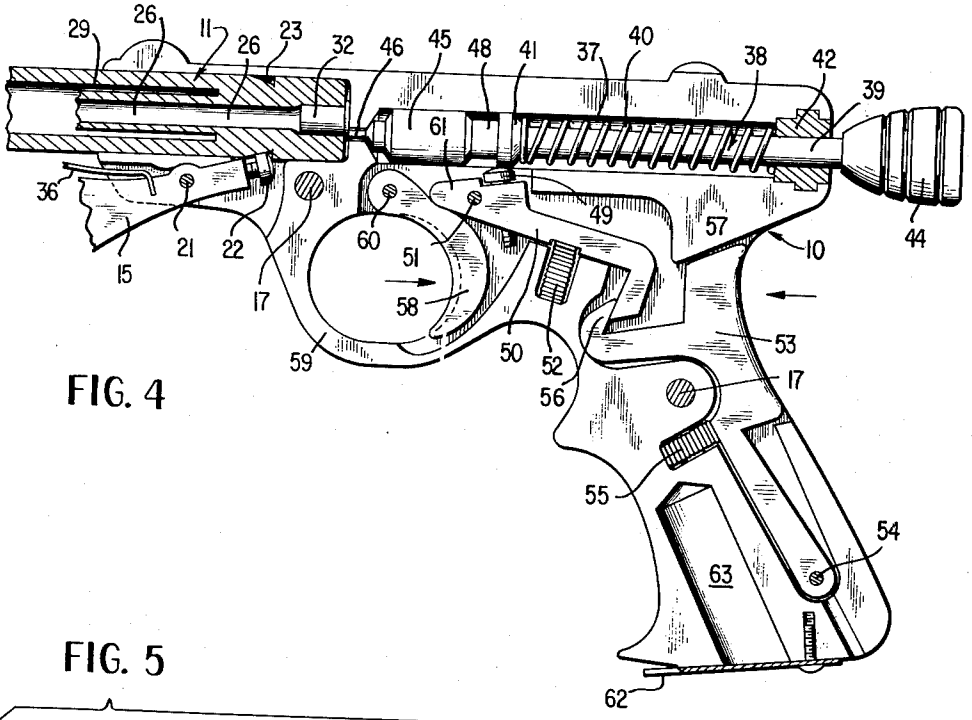


FIG. 4

FIG. 5

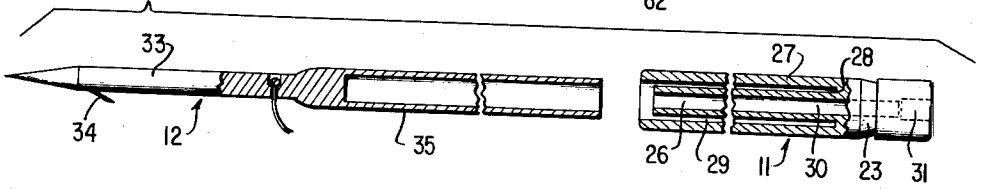
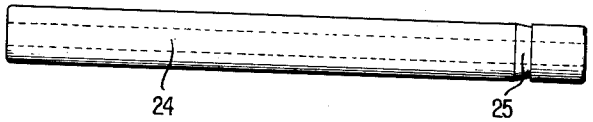


FIG. 6



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United States Patent Office 3,139,692 Patented July 7, 1964

3,139,692

CARTRIDGE POWERED SPEAR GUN

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Filed Mar. 14, 1963, Ser. No. 265,118
2 Claims. (Cl. 42—1)

This invention relates to a spear gun for propelling a projectile under water or through the air.

An object of the invention is to provide an improved and simplified spear gun of economical construction which does not require close machining tolerances and which is made entirely of materials which are resistant to corrosion in salt water and which may operate efficiently without lubrication to facilitate under water usage.

Another object is to provide a breech-loading spear gun which utilizes the explosive force of a cartridge to propel the projectile without the creation of a large amount of bubbles in the water, the gun being lightweight, compact, rugged and durable and very easy to handle and manipulate.

A further object is to provide in a spear gun a detachable barrel assembly and coacting projectile of simplified construction and increased efficiency, and which barrel assembly may be readily replaced by a conventional barrel to convert the gun into a regular pistol.

Another object is to provide a spear gun having a novel safety mechanism which is substantially foolproof.

Other objects and advantages of the invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a side elevation of a spear gun according to the invention,

FIGURE 2 is an enlarged side elevation, partly broken away and partly in section, with one-half of the receiver portion of the gun removed to show the internal parts thereof,

FIGURE 3 is a fragmentary vertical sectional view showing the firing pin assembly in the retracted or cocked position,

FIGURE 4 is a similar view showing the firing pin assembly and related elements in the firing position,

FIGURE 5 is an exploded vertical sectional view, partly in elevation and partly broken away, showing the projectile and coacting barrel assembly, and

FIGURE 6 is a side elevational view of a chambered barrel used to convert the spear gun to an ordinary pistol.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, attention is directed first to FIGURE 1, wherein the spear gun of the invention is shown in its entirety, and includes a receiver section **10**, a detachable barrel assembly **11** and a projectile or spear **12**, tethered by a suitable flexible element **13** to a slot **14** in a barrel release arm **15** to be further described. The other end of the flexible element **13** is secured at **16** to the projectile **12**.

The receiver section **10** is formed in two companion halves, one of which is removed in FIGURES 2 and 4 for the sake of clarity. The two halves of the receiver section are secured together in assembly by screws **17** or the like.

The receiver section **10** comprises a short barrel extension **18** having a bore **19** to receive the rear portion of detachable barrel assembly **11**. The barrel release arm, previously mentioned, is positioned within a slot **20** opening through the bottom of barrel extension **18** and pivotally secured therein by a screw **21** or the like which additionally serves to clamp the two halves of the receiver section together in assembly. An adjustable stop screw **22** on the inner end of arm **15** engages within a groove **23** on the rear end portion of barrel assembly **11** to lock the same releasably within the bore **19**. The barrel assembly may be readily detached from the receiver section **10** by turning the arm **15** clockwise thereon to dislodge the screw **22** from groove **23**. It might be mentioned here that the spear gun at any time may be quickly converted to an ordinary pistol, such as a .22 calibre pistol, by removing the barrel assembly **11** and replacing it in the assembly by the chambered barrel **24** shown in FIGURE 6 and having a locking groove **25** identical to the groove **23**.

The barrel assembly **11** comprises integrally formed inner and outer barrel sleeves **26** and **27** which are concentric and spaced with the inner sleeve **26** having its forward end terminating just short of the forward end of the outer sleeve **27**. The rear end **28** of the annular space **29** formed between the inner and outer barrel sleeves terminates somewhat forwardly of the external groove **23**. The bore **30** of inner barrel sleeve **26** extends rearwardly through the barrel assembly **11** and has an enlarged rear portion **31** forming a breech loading chamber for a blank cartridge **32**, such as a rim fire .22 calibre blank cartridge.

The projectile **12** or spear has a leading elongated rod portion **33** equipped with a single barb **34** and a rear enlarged tubular portion **35** adapted to be received in the annular space **29** of the barrel assembly **11** with its rear end engaging the rear end wall **28** of the barrel assembly, FIGURES 2 and 5. Thus assembled, the bore **26** forwardly of the cartridge **32** forms with the projectile a substantially closed chamber for pressure caused by the expanding gases of the exploding cartridge, and these expanding gases act on the projectile **12** and propel it forwardly with great force. The interfitting construction of the barrel assembly and projectile constitutes an important feature of the invention and the construction is highly compact and allows the overall length of the gun to be relatively small without decreasing the range and effectiveness thereof. The use of the explosive cartridge **32** rather than a spring device renders the spear gun much more effective and allows the use of a much heavier projectile. The cartridge is greatly superior to a carbon dioxide capsule in a number of respects. It is cheaper, much smaller and produces far fewer bubbles when the gun is used under water and it allows the gun to be made in a much more compact and less awkward construction.

A spring clip **36** is employed, as shown, to hold windings of the flexible element **13** and to bias the barrel release arm **15** in the barrel locking position shown in FIGURE 2.

The receiver section **10** also has a rear downwardly offset bore **37** to receive a firing pin assembly **38** having an intermediate rod portion **39** surrounded by a main spring **40** having its forward end bearing against a fixed collar **41** on the rod **39** and its rear end bearing against a shoulder plug **42**, fixed at the rear of bore **37**. The rod **39** reciprocates through a bore **43** of plug **42** and is equipped at its rear end with a manual retracting or cocking knob **44**. The firing pin assembly has an enlarged cylindrical portion **45** slidable within the bore **37** and a firing pin **46** at the leading end of the assembly projects through a reduced opening **47** in proper alignment to strike the primer of cartridge **32** when the gun is fired. Intermediate portion **45** and collar **41** is a safety locking groove **48** to receive the head of an adjustable screw **49** carried by a sear **50**, pivoted at **51** to the receiver section forwardly of the screw **49**. A sear spring **52** biases the sear in a counter-clockwise direction, FIG-

URE 2, toward a safety locking position with the firing pin assembly as shown in this figure.

A safety lever **53** on the hand grip portion of the gun is pivoted thereto at its lower end as shown at **54**. A safety lever spring **55** in the hand grip portion biases the safety lever **53** to the safety position in FIGURE 2. The safety lever **53** has a leading beveled hook-like extension **56** which coacts with a depending beveled extension **57** on the pivoted sear to prevent firing of the gun prior to squeezing of the safety lever **53**, FIGURE 4. A trigger **58** surrounded by the usual trigger guard **59** is pivoted at **60** to the receiver section and coacts with a forward cam part **61** on the sear **50** forwardly of the pivot **51** to turn the sear clockwise and release the pin assembly **38** for firing, FIGURE 4.

The gun may be equipped, as an optional feature, with a cartridge extractor blade **62** on the bottom of the hand grip thereof, and a cavity **63** for small spare parts may be provided and covered by the extractor, as shown.

When the gun is carried, the firing pin assembly is latched in the safety position shown in FIGURE 2. Prior to firing, it is cocked as shown in FIGURE 3, and the screw **49** then engages forwardly of the enlargement **45** of the firing pin. When the trigger is pulled, the sear and screw **49** release the firing pin, FIGURE 4, and the main spring **40** pushes the firing pin into engagement with the rim of the cartridge to explode it. The gun cannot be fired by the trigger until the safety lever **53** is first gripped and thrust forwardly to release the sear, as shown in FIGURE 4. The receiver section **10** has suitable internal cavities in the two mating halves thereof to accommodate all moving parts, as shown clearly in the drawings. The gun is equipped with conventional sights, as indicated.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

Having thus described our invention, we claim:

1. A spear gun comprising a receiver having a hand grip and a short barrel extension, a spring-loaded manually retractable firing pin on the receiver including a forward reduced firing pin extension, safety latch and trigger release means on the receiver to maintain the firing pin retracted and to cause the release thereof for firing the spear gun, the short barrel extension having a bore including a back wall normal thereto, said back wall having an eccentric opening adapted to receive said reduced firing pin extension upon release of the firing pin, a barrel engageable within the bore of the short barrel extension and extending forwardly of the short barrel extension and having a central rear breech loading chamber for an explosive cartridge and a rear end wall engageable with the rim of the cartridge and clamping the rim between the rear end wall and said back wall, said eccentric opening in alignment with said clamped rim, means to releasably lock said barrel within said bore in clamping engagement with said rim of the cartridge, said barrel having inner and outer substantially coextensive concentric barrel sleeves formed integrally thereon, the inner barrel sleeve communicating directly with said breech loading chamber and extending forwardly thereof and the outer barrel sleeve surrounding the inner barrel sleeve and defining therewith a narrow annular space between said sleeves throughout the major portion of the length of the barrel, and a spear projectile having a forward solid spear portion in advance of said barrel in assembly and a rear thin-walled tubular portion engageable within said annular space and substantially filling said space in assembly, whereby said forward solid portion is then positioned adjacent the forward end of the inner barrel sleeve to receive directly the explosive force from said cartridge emanating therefrom upon firing of the cartridge by said firing pin extension.

2. In a breech loading cartridge powered spear gun, a receiver having firing pin means and trigger and safety lock means for the firing pin means, a short barrel extension on the receiver having a bore and a rear flat end wall provided with an opening for the firing pin means, a barrel unit engageable within the bore of the short barrel extension and having a rear flat end wall in opposed closely spaced relation to said rear wall and also having a rear end breech loading chamber for a cartridge, the space between the rear end walls of the barrel unit and said bore receiving the rim of the cartridge with said rim clamped between said walls in alignment with said opening for the firing pin means, means to releasably lock said barrel unit within said bore, said barrel unit having an inner barrel sleeve directly in advance of the breech loading chamber and communicating therewith and an outer barrel sleeve surrounding the inner sleeve in spaced substantially concentric relation thereto, and a spear projectile having a rear tubular portion engageable within the annular space between said barrel sleeves and substantially coextensive lengthwise therewith and a forward solid portion arranged immediately forwardly in assembly of the forward end of the inner barrel sleeve to receive directly the force of explosion therefrom.

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