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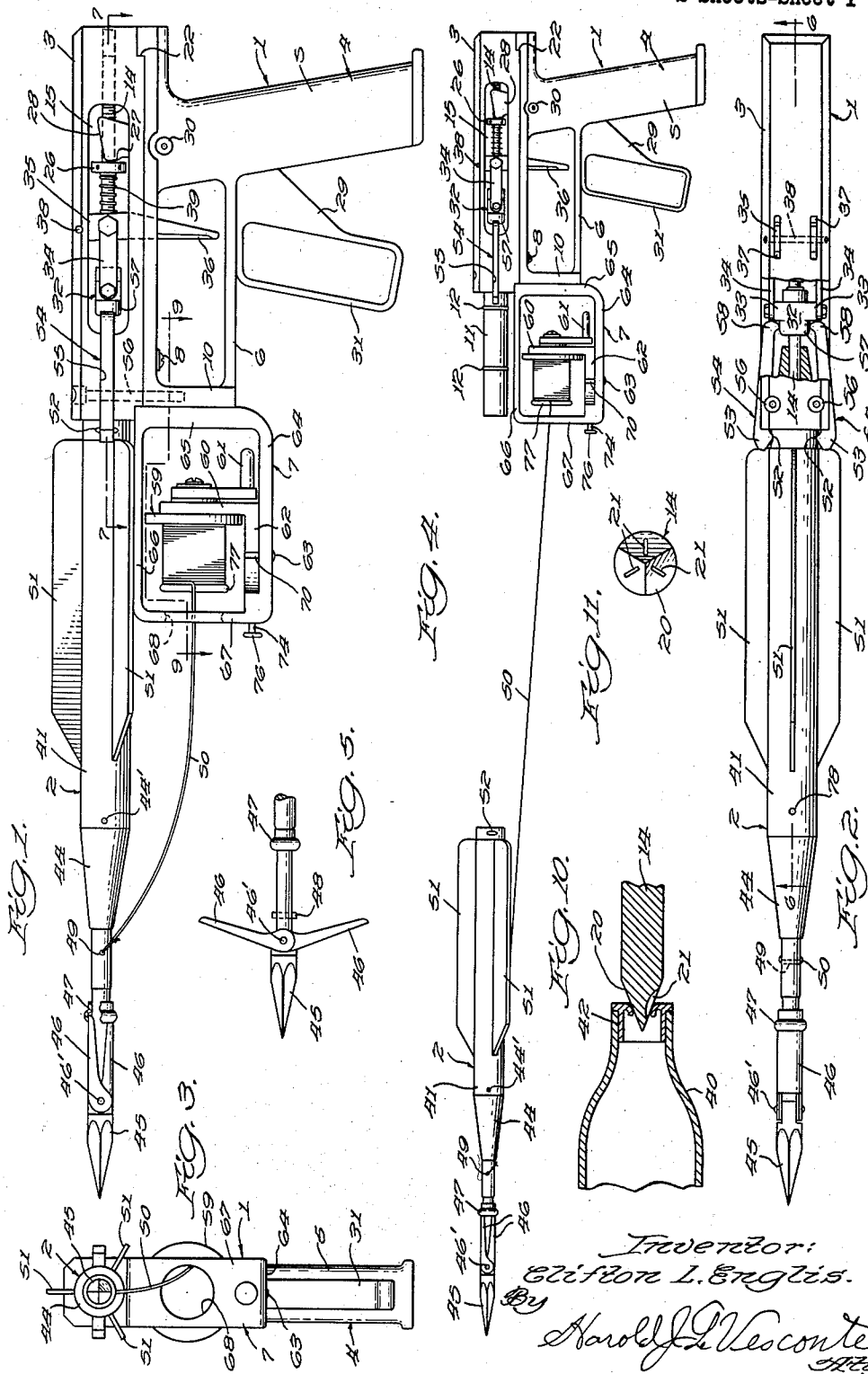
C. L. ENGLIS

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UNDERWATER MISSILE AND ACTIVATING MEANS THEREFOR

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Inventor:  
Clifton L. Englis.  
By  
Harold J. Desconte  
Att'y.



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## UNDERWATER MISSILE AND ACTIVATING MEANS THEREFOR

Clifton L. Englis, Tujunga, Calif.  
(10225 Oro Vista Ave., Sunland, Calif.)  
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This invention relates to means for propelling projectiles under water such as are used for fishing by skindivers and also for protection means by skindivers.

The principal object of the invention is to provide a means for arming and releasing a self-propelled projectile or missile under water as distinguished from the usual underwater "gun" in which the projectile is not self-propelled.

Another object of the invention is to provide an underwater weapon comprising a self-propellable missile and a means for holding, arming, aiming and releasing the missile for self-propulsion toward a selected target.

Still another object of the invention is to provide a weapon means for submarine use comprising a holding and aiming means, a self-propelled projectile or missile released by said first means, a retrieving line having one end attached to the missile and means on said holding and aiming means connected to the other end of said line manually operable to retrieve the missile together with the fish or the like impaled thereby.

A still further object of the invention is to provide a weapon means for underwater use comprising a missile component and a holding and aiming component and in which the missile component is provided with a rearwardly facing compartment for a replaceable compressed gas cartridge and in which said holding and aiming component includes trigger means for piercing said cartridge adjacent to the open rear end of said missile component and other releasable means for holding the missile component prior to initial release of the gas with resultant arming of the missile component for self-propulsion when released from said holding and aiming means.

Still another object of the invention is to provide an underwater weapon means in which the foregoing objectives are realized in practice which is simple in construction and which is readily capable of being cleaned when fouled with mud or dirt from the bottom of the ocean or the like without the necessity of taking the device apart for such purposes.

With the foregoing objects in view, together with such additional objects and advantages as may subsequently appear, the invention resides in the parts, construction, combination and arrangement of parts described, by way of example, in the following specification of a presently preferred embodiment of the invention, reference being had to the accompanying drawings which form a part of said specification and in which drawings:

FIG. 1 is a side elevational view of a weapon means for underwater use comprising a presently preferred embodiment of the invention; the holding and aiming component and the missile components being showed as assembled for "shooting."

FIG. 2 is a top plan view of the device as shown in FIG. 1, a portion of the top of one component being broken away to show interior details,

FIG. 3 is a front elevational view of the device as shown in FIG. 1,

FIG. 4 is a side elevational view of the device as activated or "discharged,"

FIG. 5 is an enlarged, side elevational view of the missile point with the barbs thereof released,

FIG. 6 is an enlarged scale, side elevational sectional view taken on the medial line 6-6 of FIG. 2,

FIG. 7 is a fragmentary top plan view of the same scale as FIG. 6 taken on the line 7-7 and showing the missile releasing means at the instant of such release,

FIG. 8 is a view similar to FIG. 7 but showing the missile completely released,

FIG. 9 is an enlarged scale fragmentary sectional view taken on the line 9-9 of FIG. 1 and particularly showing details of the line retrieving means,

FIG. 10 is a further enlarged fragmentary sectional view taken on the line 6-6 of FIG. 2 and particularly showing the piercing of the gas cartridge component of the missile propelling means, and

FIG. 11 is a greatly enlarged end elevational view of the cartridge seal piercing means.

Referring to the drawings, the illustrated embodiment of the invention includes a missile holding, aiming, and releasing device 1 which, for convenience, will hereafter be referred to as the "gun" component and a "missile" component 2. The gun component frame structure comprises a missile engaging member 3, a handle component 4 including a grip portion 5 and a trigger guard 6, and a reel housing or frame 7; the said components preferably but not necessarily being formed of metal castings and also being preferably formed from metal or alloy not adversely affected by sea water. Screws 8 secure the handle component to the underside of the rear end of a missile engaging member and screws 9 secure the rear end of the reel housing 7 to the forward end of the handle component, specifically, to the front member 10 of the trigger guard.

The missile holding component 3 is generally rectangular in cross section at the point of attachment to the handle component and forward thereof it extends as a cylindrical portion 11 provided with O-rings 12, 12 seated in peripheral grooves on which the missile component is mounted with a gas tight fit as will presently be explained. Disposed axially of the missile supporting portion 11 and extending from end to end of the member 1 is a bore 13 in which a plunger rod 14 is reciprocally mounted; said bore adjacent the rear end of the member 1 being interrupted by an elongated horizontally transverse slot 15 extending from side to side of the component 3. The extreme rear end of the bore 13 is reduced in diameter and threaded to engage a stop screw 16 adjustable therein to limit the extent of the rearward movement of the plunger rod 14. The outer or forward end of the missile holding portion 11 has a threaded axial counterbore 17 in which a guide bushing 18 is located; said guide bushing having an axial bore therethrough in which the forward end of the plunger 14 extends and the rear face of the bushing 18 is provided with a shallow counterbore which cooperates with the bottom of the bore 17 to secure an O-ring 19 closely surrounding the plunger 14 and effecting a gas tight seal therewith while offering means for the removal and replacement of the said O-ring. The distal end of the plunger rod 14 extends through the bushing 18 and into the bore 17 and terminates in a triangular, pyramidal point 20, at least one of the faces of said point having a longitudinally extending groove 21 formed therein. To spare the screws 8, 8 from shear stress incident to activation of the weapon, the meeting surfaces of the missile engaging member 1 and handle component 4 are provided with a transversely extending offset 22 affording a shoulder against which the reaction of the member 3 to discharge of the propelling cartridge means is received by the handle component 5.

The lower side of the missile engaging member 3 below the transverse slot 15 is provided with a longitudinally extending slot 23 which overlies a corresponding slot 24 in the upper face of the handle portion 4. The slot 24 opens into the rear portion of the trigger guard

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6 and another portion 25 continues down into the handle 5 and opens into the front face of the handle below the trigger guard. The rear end of the plunger rod 14 is threaded and a collar 26 is threaded thereon. The rear face of the collar 26 is engaged by the cam faces 27, 27 of a yoke 28 which straddles the threaded portion of the plunger rod 14 and which is carried by a lever arm 29 extending downwardly from the yoke 28 through the rear end portions of the slots 23 and 24 and which is pivotally mounted on a transverse pivot pin 30 extending across the upper end of the extension 25 of the said slot 24. The lever arm 29 extends along the slot portion 25 and emerges at the front edge of the handle portion 5 in a hand engaging loop or guard portion 31. When the hand portion 5 and the loop 31 are squeezed together, the plunger rod will be caused to move forward or to the left as viewed in FIG. 6.

Slidably mounted on the plunger rod 14 immediately rearward of the forward end of the transverse slot 15 is a block 32 having diametrically opposite bosses 33, 33 connected by links 34, 34 to the yoke arms 35, 35 of a trigger member 36 extending through the forward ends of the slots 23 and 24 and disposed within the loop of the trigger guard 6. The yoke arms 35, 35 straddle the plunger rod 14 and extend through slots 37, 37 in the portion of the missile engaging member above the transverse slot 15 and are pivotally mounted on a transverse pin 38 in said portion. A compression spring 39 surrounds the rod 14 and reacts between the opposed faces of the block 32 and the collar 26 in a manner to be explained.

The missile propelling means illustrated comprises a gas cartridge 40 which is removably disposed in the forward end of the tubular member 41 of the missile component 2; the sealed end 42 of the cartridge being toward the rear, and the bottom or forward end of the cartridge being seated on a rubber seal 43 at the bottom or forward end of the tubular member 41 to which further reference will be made. The tubular member 41, in addition to housing the gas cartridge 40, effects a close sliding fit over the portion 11 of the missile engaging member and forms a gas tight seal with the O-rings 12, 12 thereon. The forward end of the tubular member 41 is closed by the shank end of a connector member 44 secured therein by a crosspin 44', said shank end having a bore 43' therein in axial alignment with the interior of said tubular member and in which the shank portion of the rubber seal 43 is seated, said seal having an axial opening therein affording communication between the bore 43' and the interior of the tubular member 41. The connector member 44 has a forwardly extending frusto-conical surface and terminates in a threaded bore in which the threaded end of a spear point 45 is received. The spear point may carry barb elements 46, 46 pivoted thereon at 46' having the trailing ends thereof normally held by a sliding collar 47 which is displaced rearwardly to release the barb elements upon contact with the body of a fish or the like. A rubber plug 48 extending transversely through the spear point rearwardly of the hinged mounting for the barb members and compressed by the closure of the barb elements thereagainst affords an initial outward bias to the ends of the barbs which tend to hold the collar 47 in place and also upon displacement rearwardly of the collar 47 to impart initial outward movement of the barbs. Rearwardly of the collar 47, the shank 45 of the spear point may be provided with a transverse hole 49 for attachment of one end of a retrieving line 50; the other end of which is attached to retrieving reel means presently to be described.

The exterior of the tubular member 41 of the missile component is provided with a series of three radially spaced, longitudinally extending vanes or fins 51, one of which extends vertically and affords sighting means before release of the missile, and the other two of which

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extend oppositely, diagonally, downwardly as best shown in FIG. 3.

The rear ends of the fins 51 terminate slightly forwardly of the rear end of the tubular member 41 leaving a short cylindrical exterior surface which carries laterally diametrically opposite rounded notches 52, 52 on the outer surface thereof. When the missile component including a gas cartridge is mounted on the member 11 and is pressed thereon sufficiently to cause the cartridge to slightly compress the cushion or gasket 43 by engagement of the shoulder of the cartridge with the end of the member 11, the notches 52, 52 are engaged by the forward turned ends 53, 53 of a pair of levers 54, 54 mounted in horizontally extending slots 55, 55 in the opposite sides of the member 3 and extending from the forward end of the transverse slot 15 to and beyond the end of the rectangular portion of the member 3. Vertically extending screws 56, 56 adjacent the forward ends of the levers 54, 54 afford pivots for the levers. The rear ends of the levers 54, 54 extend to the range of trigger induced movement of the block 32 and when the forward ends of these levers are engaged with a missile, a cylindrical projection 57 on the front end of said block enters between the returned rear end portions 58, 58 as shown in FIG. 2 of the levers, holding the said rear ends thereof spaced apart sufficiently so that the forward ends of the levers will firmly grip the notches 52, 52 in the tubular member 41 of the missile. At the same time, the force of the spring 39 tends to hold the block 32 in that position and the laterally extending portions of the block 32 to which the links 34, 34 are attached engage the ends of the levers 54, 54 and the levers thus serve as abutments against which the spring 39 reacts to hold the plunger 14 in retracted position.

Assuming that a missile device properly located with a cartridge is mounted on and locked onto the gun component and that the user is ready to discharge the weapon, the lever 29 is actuated against the bias of the spring 39 to cause the plunger rod 14 to move forward and pierce the cartridge seal 42 with resultant release of the gas into the area around the cartridge. The groove or grooves 21 insure gas release prior to retraction of the plunger rod point. The seals 12, 19 and 43 prevent the escape of the released gas while allowing it to build up pressure within the tubular member 41. The device is now armed and is ready to be discharged. Pulling on the trigger 36 against the bias of the spring 39 will withdraw the boss 57 of the block 32 from between the lever ends 58, 58 and as soon as the block is thus retracted, the pressure of the gas will force the missile off of the gun component and will propel it toward the selected target object in the manner of an underwater rocket. By this means, over the first portion of its trajectory, the missile component gains both in speed and consequent power of penetration as distinguished from prior gas operated underwater "guns" in which the propelling force is in the "gun" rather than the missile component.

The missile retrieving means comprises a rotatable spool or reel 59 to which the other end of the retrieving line 50 is attached; said spool or reel being journaled on a bracket 60 and having an operating crank 61 at the opposite side of the bracket. The bracket 60 is formed as an integral part of a base 62 which extends beneath the spool and which is pivotally mounted by a screw 63 on the top surface of the lower member or run 64 of the reel housing 7; said pivot being preferably disposed in line with the axis of the spool 59 and at the midlength of said axis. As shown in FIGS. 1, 4 and 6, this reel housing is in the form of a rectangle open at both sides and in addition to the lower wall or run 64 above referred to, includes a rear vertical wall 65 through which the mounting screws 9, 9 extend, a top wall 66 and a front wall 67 having a large opening 68 therein through which the line passes as it is pulled from or is wound onto the reel spool. The end face of the bracket 62 opposite the

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bracket 61 is formed in a semi-circle generated about the axis of the screw 63 and is provided with a first notch 69 in alignment with a vertical plane containing the axis of the reel spool and also is provided with two other notches 70, 70 at right angles to said plane. The front wall 67 of the reel housing or frame adjacent its juncture with the bottom wall 64 has an opening 73 extending therethrough in alignment with said plane of said reel spool axis in which a detent rod 74 is reciprocable and is normally yieldingly pressed by a spring 75 into one of the said notches that is both in alignment therewith. A head 76 on said detent rod exteriorly of the walls 67 affords means for momentarily manually disengaging the detent rod from the one of the notches with which it is engaged preparatory to changing the position of the reel in the reel housing.

Incident to discharge of the weapon, the reel is in the position shown in FIGS. 1, 4 and 6 with the reel axis parallel to the direction of travel of the missile so that the line is pulled off the reduced diameter end 77 of the spool, the opening 68 in the reel frame wall 67 permitting such action while restraining the line against excessive whipping. To retrieve the line, the detent 74 is pulled out of the notch 69 and the reel and bracket swung to engage the desired one of the notches 70 by the detent as shown in FIG. 9, whereupon, by operating the crank 61, the line can be rewound on the reel.

There remains to be described the operation of reloading the device. The cartridge 40 fits loosely within the tubular member 41 and if not dislodged incident to the retrieving of the missile, it can readily be shaken out of the tubular member 41 since air or water can enter through the radial opening 78 which communicates with the bore 43' and the axial bore 80 extending through the cushion or gasket 43. As has been mentioned previously, this cushion or gasket is compressed by mounting of the cartridge on the "gun" component, wherefore the rounded end of the cartridge seals the opening 80 to prevent the escape of gas therefrom prior to the release of the missile. The periphery of the cushion 43 also seals the joint between the tubular member and the shank of the connector member 44 to similarly prevent the escape of gas. Thus, the weapon may be reloaded while submerged.

An advantage to be particularly noted is that the design of the device is such that if dropped on sandy or muddy bottom, there is nothing in the mechanism thereof that can be harmed and any sand or mud lodged therein can be readily dislodged by a movement of the device through the water.

While in the foregoing specification there has been described a presently preferred embodiment of the invention, the invention is not to be deemed to be limited to the exact details of construction thus disclosed by way of example and it will be understood that the invention includes as well all such changes and modifications in the parts, and in the construction, combination and arrangement of parts as shall come within the purview of the appended claims.

I claim:

1. In a missile firing means for underwater use, a missile holding, arming, and releasing device and an elongated missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device against propulsion by released gas from said means, a first manually operable means on said device for activating the propulsion means with resultant arming of said missile component for said propulsion, interengaging gasket means interposed between said device and said missile component effective to prevent the escape of released gas deriving from said activation

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of said propulsion means while said missile component remains secured to said device by said first-named interengaging means, and a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means.

2. In a missile firing means for underwater use, an elongated missile holding, arming, and releasing device and a missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device against propulsion by release of gas from said propulsion means, a first manually operable means on said device for activating the propulsion means with resultant arming of said missile component for said propulsion, interengaging gasket means interposed between said device and said component effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component remains secured to said device by said first-named interengaging means, a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means and spring means normally holding both said manually operable missile component arming means and said missile component releasing means in inactive position.

3. In a hand-fired missile releasing means for underwater use, a missile holding, aiming, arming, and releasing device and an elongated missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device against propulsion by release of gas from said propulsion means, a first manually operable means on said device for activating the propulsion means on said missile component while said missile component remains attached to said device with resultant arming of said missile component for said propulsion, interengaging gasket means interposed between said device and said component effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component remains secured to said device, and a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means.

4. In a hand-fired missile releasing means for underwater use, a missile holding, aiming, arming, and releasing device having a handle and an elongated missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device, a first manually engageable means on said device including a member movable toward said handle for activating the propulsion means on said missile component while said missile component remains secured to said device with resultant arming of said missile component for said propulsion by release of gas from said propulsion means, interengaging gasket means interposed between said device and said component effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component re-

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mains secured to said device, and a second manually engagable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and spring means normally holding both said manually operable missile component arming means and said missile component releasing means in inactive position.

5. In a missile firing means for underwater use, a missile holding, arming, and releasing device and an elongated missile component releasably secured to said device; said missile component having a cylindrical chamber disposed in the longitudinal axial line of said component and provided with a rearwardly directed opening, said chamber serving as a receptor for a normally non-activated propulsion means adapted, upon activation, to discharge gas from said opening for propulsion of said missile component; the rearmost portion of said chamber opening serving additionally as a socket for mounting said missile component on said device, interengaging means on said device and said missile component for releasably securing said missile component to said device with a portion of said device engaging said socket portion of said missile component, a first manually operable means on said device for activating propulsion means contained in said chamber with resultant arming of said missile component while said component is secured to said device, interengaging gasket means interposed between the wall of said socket portion and the portion of said device engaged by said socket portion of said chamber effective to prevent the escape of released gas deriving from activation of said propulsion means while said missile component remains secured to said device by said first-named interengaging means, and a second manually engagable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device and through the water by said activated, gas-releasing propulsion means.

6. In a missile firing means for underwater use, a missile holding, arming, and releasing device and an elongated missile component releasably secured to said device; said missile component having a cylindrical chamber disposed in the longitudinal axial line of said component and having a rearwardly directed opening, said chamber serving as a receptor for a normally non-activated propulsion means adapted, upon activation, to discharge gas from said opening for propulsion of said missile component; the rearmost portion of said opening serving additionally as a socket for mounting said missile component on said device, interengaging means on said device and said missile component for releasably securing said missile component to said device with a portion of said device engaging said socket portion of said missile component, a first manually operable means on said device for activating propulsion means contained in said chamber with resultant arming of said missile component while secured to said device, interengaging gasket means interposed between the wall of said socket portion and the portion of said device engaged by said socket portion of said chamber effective to prevent the escape of released gas deriving from activation of said propulsion means while said missile component is secured to said device by said first-named interengaging means, and a second manually engagable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device and through the water by said activated, gas-releasing propulsion means, and spring means normally holding both said manually operable missile component arming means and said missile component releasing means in inactive position.

7. In a missile firing means for underwater use, a missile holding, aiming, arming and releasing device adapted to be held in the manner of a firearm and hav-

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ing a cylindrical, missile mounting member, and an elongated missile component releasably secured to said device; said missile component having a chamber disposed in the longitudinal axial line of said component and having a rearwardly directed opening, said chamber serving as a socket for a normally non-activated propulsion means adapted, upon activation, to discharge gas from said opening for propulsion of said missile component; the rearmost portion of said chamber serving additionally as a socket for mounting said missile component on said cylindrical member, latch means on said device engaging said missile component and normally effective to lock said missile component against axial movement on said cylindrical member, a first manually operable means on said device for activating said propulsion means with resultant arming of said missile component, gasket means on said cylindrical member engaging said socket portion of said chamber effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component is secured to said device by said latch means, and a second manually engageable means on said device operable to disengage said latch means with resultant release of said missile component for propulsion thereof by said activated, gas-releasing propulsion means.

8. In a missile firing means for underwater use, a missile holding, aiming, arming and releasing device adapted to be held in the manner of a firearm and having a cylindrical, missile mounting member, and an elongated missile component releasably secured to said device; said missile component having a chamber disposed in the longitudinal axial line of said component and having a rearwardly directed opening, said chamber serving as a receptor for a normally non-activated propulsion means adapted, upon activation, to discharge gas from said opening of said chamber for propulsion of said missile component; the rearmost portion of said chamber serving additionally as a socket for mounting said missile component on said cylindrical member, latch means on said device engaging said missile component and normally effective to lock said missile component against axial movement on said cylindrical member, a first manually operable means on said device for activating said propulsion means with resultant arming of said missile component, gasket means on said cylindrical member engaging said socket portion of said chamber, effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component is secured to said device by said latch means, a second manually engageable means on said device operable to disengage said latch means with resultant release of said missile component for propulsion thereof by said activated, gas-releasing propulsion means, and spring means normally holding both of said manually operable means, in their respective inactive positions.

9. In a missile firing means for underwater use, a missile holding, arming, and releasing device including a cylindrical, missile mounting member and an elongated missile component releasably secured to said device; said missile component having a cylindrical chamber provided with a rearwardly directed opening and adapted to house a cartridge of compressed gas at the forward end of said chamber with said cartridge disposed therein with a rupturable surface at the rear end thereof; the rear end of said chamber affording a cylindrical socket engaging said cylindrical member with resultant mounting of said missile component on said device, interengaging means on said device and said missile component for releasably securing said missile component against axial movement relative to said device, a first manually operable means for rupturing said rupturable surface of said gas cartridge and release of the gas contained therein, gasket means on said cylindrical member engaging said socket portion of said chamber effective to prevent the escape of gas therebetween, and a second



manually engageable means of said device operable to disengage said first-named interengaging means with resultant release of said missile component from engagement with said device for propulsion from said device by gas released from said cartridge.

10. In a missile firing means for underwater use, a missile holding, arming, and releasing device including a cylindrical, missile mounting member and an elongated missile component releasably secured to said device; said missile component having a cylindrical chamber provided with a rearwardly directed opening and adapted to house a cartridge of compressed gas at the forward end of said chamber with said cartridge disposed therein with a rupturable surface at the rear end thereof; the rear end of said chamber affording a cylindrical socket engaging said cylindrical member with resultant mounting of said missile component on said device, interengaging means on said device and said missile component for releasably securing said missile component against axial movement relative to said device, a first manually operable means for rupturing said rupturable surface of said gas cartridge and release of the gas contained therein, gasket means on said cylindrical member engaging said socket portion of said chamber effective to prevent the escape of gas therebetween, and a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component from engagement with said device for propulsion from said device by gas released from said cartridge, and a single spring means normally holding both of said manually operable means in their respective inactive positions.

11. In a missile firing means for underwater use, a missile holding, arming, and releasing device and a missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device against propulsion by release of gas from said propulsion means, a first manually operable means on said device for activating the propulsion means with resultant arming of said missile component for said propulsion, interengaging gasket means interposed between said device and said missile component effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component remains secured to said device by said first-named interengaging means, a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and missile retrieving means carried by said device comprising a manually operated reel including a spool axially supported at one end only and a line having one end thereof connected to said spool and the other end thereof connected to said missile component; said reel being manually shiftable between a position in which the axis of said spool is parallel to the line of travel of the missile component for stripping the line off of the unsupported end of said spool incident to propulsion of said missile component and a position at right angles to said line of travel for retrieving said line and the missile component attached thereto by winding said line on said spool.

12. In a hand-fired missile releasing means for underwater use, a missile holding, aiming, arming, and releasing device and a missile component releasably secured to said device and having gas-releasing propulsion means incorporated therein and arranged to release the propelling gas through a rearwardly directed opening on said missile component, interengaging means on said device and said missile component for releasably securing said missile component on said device, a first manually op-

erable means on said device for activating the propulsion means on said missile component while said missile component remains secured to said device with resultant arming of said missile component, interengaging gasket means interposed between said device and said missile component effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component is secured to said device, a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and missile retrieving means carried by said device comprising a manually operated reel including a spool axially supported at one end only and a line having one end thereof connected to said spool and the other end thereof connected to said missile component; said reel being manually shiftable between a position in which the axis of said spool is parallel to the line of travel of the missile component for stripping the line off of the unsupported end of said spool incident to propulsion of said missile component and a position at right angles to said line of travel for retrieving said line and the missile component attached thereto by winding said line on said spool.

13. In a missile firing means for underwater use, a missile holding, arming, and releasing device and a missile component releasably secured to said device; said missile component having a cylindrical chamber disposed in the longitudinal axial line of said component and provided with a rearwardly directed opening, said chamber serving as a receptor for a normally nonactivated propulsion means adapted, upon activation, to discharge gas from said opening for propulsion of said missile component; the rearmost portion of said chamber serving additionally as a socket means for mounting said missile component on said device, interengaging on said device and said missile component for releasably securing said missile component to said device with a portion of said device engaging said socket portion of said missile component, a first manually operable means on said device for activating propulsion means contained in said chamber with resultant arming of said missile component while secured to said device, interengaging gasket means interposed between the wall of said chamber and the portion of said device engaged by said socket portion of said chamber effective to prevent the escape of released gas deriving from activation of said propulsion means while said missile component is secured to said device by said first-named interengaging means, a second manually engageable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and missile retrieving means carried by said device comprising a manually operated reel including a spool axially supported at one end only and a line having one end thereof connected to said spool and the other end thereof connected to said missile component; said reel being manually shiftable between a position in which the axis of said spool is parallel to the line of travel of the missile component for stripping the line off of the unsupported end of said spool incident to propulsion of said missile component and a position at right angles to said line of travel for retrieving said line and the missile component attached thereto by winding said line on said reel.

14. In a missile firing means for underwater use, a missile holding, aiming, arming and releasing device adapted to be held in the manner of a firearm and having a cylindrical, missile mounting member, and a missile component releasably secured to said device; said missile component having a chamber disposed in the longitudinal axial line of said component and provided with a rearwardly directed opening, said chamber serving as a receptor for a normally non-activated propulsion means adapt-

ed, upon activation, to discharge gas from said opening for propulsion of said missile; the rearmost portion of said chamber serving additionally as a socket for mounting said missile component on said cylindrical member latch means on said device engaging said missile component and normally effective to lock said missile component against axial movement on said cylindrical member, a first manually operable means on said device for activating said propulsion means with resultant arming of said missile component, gasket means on said cylindrical member engaging said socket portion of said chamber effective to prevent the escape of released gas deriving from said activation of said propulsion means while said missile component is secured to said device by said latch means, a second manually engagable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and missile retrieving means carried by said device comprising a manually operated reel including a spool axially supported at one end only and a line having one end thereof connected to said spool and the other end thereof connected to said missile component; said reel being manually shiftable between a position in which the axis of said spool is parallel to the line of travel of the missile component for stripping the line off of the unsupported end of said spool incident to propulsion of said missile component and a position at right angles of said line of travel for retrieving said line and the missile component attached thereto by winding said line on said reel.

15. In a missile firing means for underwater use, a missile holding, arming, and releasing device including a cylindrical, missile mounting member and a missile component releasably secured to said device; said missile component having a cylindrical chamber provided with a rearwardly directed opening and adapted to house a

cartridge of compressed gas at the forward end of said chamber with said cartridge disposed therein with a rupturable surface at the rear end thereof; the rear end of said chamber affording a cylindrical socket engaging said cylindrical member and affording mounting means for said missile component on said device, interengaging means on said device and said missile component for releasably securing said missile component against axial movement relative to said device, a first manually operable means for rupturing said rupturable surface of said gas cartridge and release of the gas contained therein, gasket means on said cylindrical member engaging said socket portion of said chamber effective to prevent the escape of gas therebetween, a second manually engagable means on said device operable to disengage said first-named interengaging means with resultant release of said missile component for propulsion from said device by said activated, gas-releasing propulsion means, and missile component retrieving means carried by said device comprising a manually operated reel including a spool axially supported at one end only and a line having one end thereof connected to said spool and the other end thereof connected to said missile component; said reel being manually shiftable between a position in which the axis of said spool is parallel to the line of travel of the missile component for stripping the line off of the unsupported end of said spool incident to propulsion of said missile component and a position at right angles to said line of travel for retrieving said line and the missile component attached thereto by winding said line on said spool.

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