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DISAPPEARING GUN FOR SUBMARINES.

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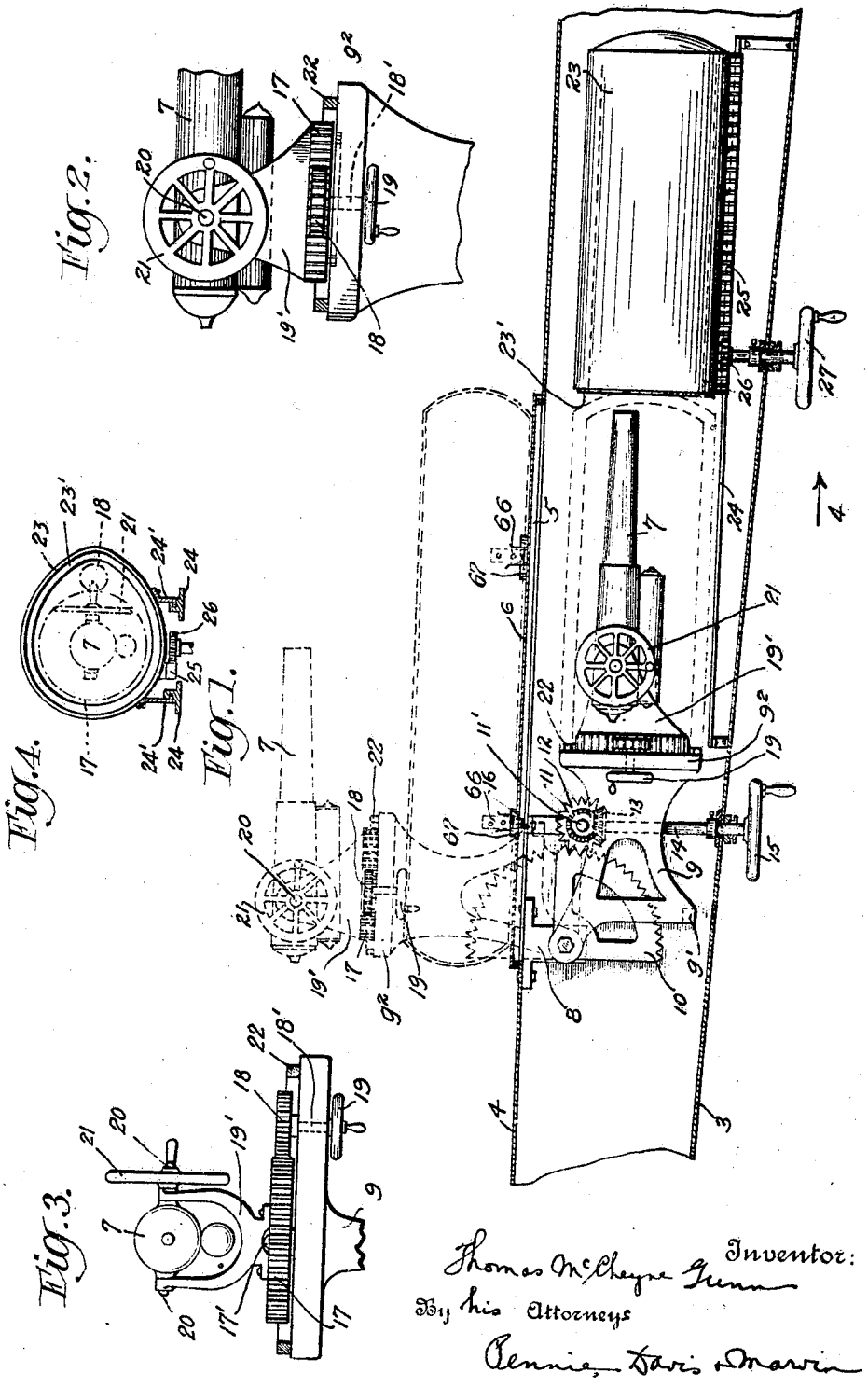


Fig. 2.

Fig. 4.

Fig. 1.

Fig. 3.

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UNITED STATES PATENT OFFICE.

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DISAPPEARING GUN FOR SUBMARINES.

1,376,536. Specification of Letters Patent. Patented May 3, 1921.

Application filed September 12, 1916. Serial No. 119,640.

To all whom it may concern:

Be it known that I, THOMAS McCHEYNE GUNN, a citizen of the United States, residing at the city of New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Disappearing Guns for Submarines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to auxiliary armament for submarine torpedo boats.

The provision of auxiliary armament in the form of emplaced ordnance of moderate caliber on a submarine is generally recognized as desirable, but the mounting of such ordnance heretofore carried is open to various objections.

For most effective operation the guns are preferably mounted on the superstructure deck, but when the boat is running submerged the exteriorly carried gun materially reduces the speed and when the boat is on the surface and the gun is not in actual use it takes up valuable space which might be put to other use. Moreover, the gun itself is large enough to be discernible for a considerable distance, so that the boat must be submerged sufficiently to cover the gun to be inconspicuous, thus lengthening the time required for effective submergence upon sighting a hostile craft.

The exposure of the exteriorly mounted gun to the action of the water when submerged and to the weather when on the surface is also objectionable because it shortens the useful life of the gun and necessitates overhauling the gun after coming to the surface before the gun can be used.

The mounting of the gun within the hull of the vessel is not desirable for the reason that the space occupied in the interior of the boat cannot be spared and also because of the difficult problem of taking care of the recoil while maintaining the compartment water-tight. Also the gun can be used much more effectively from a position on deck.

The present invention has for its object the mounting of a suitable piece of ordnance on a submarine boat in such manner that the above mentioned objectionable features are entirely obviated, and to that end the gun is mounted so as to lie when not in use in the space between the superstructure and the top of the hull, the gun carriage being provided with suitable means preferably operable from within the hull for raising the gun above the level of the deck when it is to be used. Since, customarily, the superstructure is self-filling and self-bailing, the superstructure above the space within which the gun lies when not in operation need merely be cut away by a permanently open hatch, or a hatch-cover may be used in order to provide floor area on deck.

The present invention also provides a movable sheathing device or protective jacket covering the gun barrel, the sighting, recoil, elevating and training mechanisms, etc., so that the parts will not be subjected to the action of the water during awash or submerged running. The jacket is always located within the superstructure space and is so mounted and connected with an operating controller that after the gun has been shifted to inoperative position, the jacket may be quickly shifted to create a water-tight compartment within which are inclosed the parts to be protected.

In the accompanying drawing, which illustrates an embodiment of the invention as at present preferred,

Figure 1 shows in side elevation and in full and dotted lines the gun and its jacket in their different positions of adjustment.

Fig. 2 shows in full lines an enlarged view of certain of the parts which are disclosed in Fig. 1;

Fig. 3 is a rear elevation of the parts shown in Fig. 2; and

Fig. 4 is an end elevation of the jacket, looking forward or in the direction of the arrow 4 of Fig. 1.

In this drawing, the reference numerals 3 and 4 represent respectively portions of the hull and superstructure-deck as these parts would be disclosed were the submarine divided by a vertical plane passing through the longitudinal center line of the boat.

Deck 4 is provided with an elongated hatch 5, associated with which is a cover 6, suitably hinged at 66 to the edge of the hatch, which cover, when the gun 7 is adjusted below the superstructure deck may constitute a spray-tight closure for the hatch.

A depending bracket 8, constituting a pivotal support for the gun-standard 9, is attached to the under side of the deck 4. Fixedly attached to standard 9 is a gear segment 10 meshing with which is pinion 11, loosely mounted on a stub-shaft 11′ supported in a hanger attached to the under side of the deck. Pinion 11 fixedly carries a miter gear 12 meshing with a similar gear 13 fixedly carried by a vertical shaft 14, the lower end-portion of which extends through a suitably packed bearing in the hull wall 3 into the interior of the submarine and has fixedly mounted thereon an operating hand-wheel 15.

The standard 9 carries an offset lug 9′ to coöperate with a suitably anchored stop-piece 16, so that when the hand-wheel 15 is operated to elevate the standard the lug will engage the stop when the standard is in substantially vertical position as shown in broken lines. The standard carries at its outer end a table 9^2 on which is centrally supported a large gear 17 turning on a stud 17′. The gear 17 is rotated by means of a pinion 18 fixed to the upper end of a vertical shaft 18′, passing through the table and provided on its lower end with a direction hand-wheel 19.

Fixedly mounted on the outer face of the gear 17 is a bifurcated standard 19′ providing journals for the trunnions 20 carried by the gun barrel. One of the trunnions is prolonged and carries at its outer end beyond the standard an elevating hand-wheel 21.

Hatch-cover 6 is constructed so that it may be raised, when the gun standard is elevated, by the mere pressure of the table 9^2 against the cover. The hinges 66 will probably be of the spring type, and hold the cover normally in a closed position so that, as the gun standard is subsequently lowered an automatic closing of the hatch cover will be assured.

After hand-wheel 15 is turned to dispose standard 9 vertically, elevating hand-wheel 21 is turned to locate gun 7 as shown in broken lines in Fig. 1 to prepare the gun for aiming. During such aiming, the gun is trained by turning the direction hand-wheel 19 and is elevated by turning the elevating hand-wheel 21. Elevating hand-wheel 21 is also used to arrange the gun vertically when the gun standard is to be lowered. Immediately thereafter hand-wheel 15 is operated from the interior of the submarine to dispose the gun-standard and the gun as shown in full lines in Fig. 1.

Located within the superstructure space is a substantially cylindrical protecting jacket 23 of a size and shape to cover all parts of the gun above the table top. This jacket is movable lengthwise of the boat along tracks 24 to take up either the full-line or the broken-line locations thereof indicated in Fig. 1. The jacket carries a fixed rack 25 which meshes with a pinion 26 fixedly mounted upon the upper end of a short vertical shaft suitably mounted in the wall 3 of the hull and on the lower end of which within the hull, is secured a hand-wheel 27.

When the hand-wheel 27 is operated, the jacket moves lengthwise of the tracks 24, the jacket being preferably supported on suitable guides 24′ provided with projections which engage grooves in the tracks to prevent the jacket from being lifted off the tracks. The jacket is closed at its outer end, and its end adjacent the gun is open and provided with an annular rubber gasket 23′.

The upper surface of the table 9^2 is provided as shown in Fig. 2 with an annular rib 22, and the gasket, when the hand-wheel 27 has been operated to move the jacket 23 toward the table, bears tight against rib 22 and thus said jacket makes a water-tight envelop for the gun barrel and such delicate sighting, recoil, elevating and training devices as are located above the table top. Jacket 23, which is so positioned while the gun is normally in its inoperative position, is quickly shifted forward preparatory to an actuation of hand-wheel 15 to bring the gun and standard from concealment.

It will of course be understood that the various hand-wheels and the parts worked thereby are not essential to the invention and that the other mechanisms for effecting the desired movements may be used. As shown, the hand-wheel 19, the gear segment 10 and the pinions 11, 12 and 13 are not sheathed by jacket 23 when the jacket is moved aft, but these parts are, of course, very rugged and will not suffer any damage as the result of being exposed to water currents within the superstructure. In practically all cases, even where submergence becomes suddenly necessary while the gun is on deck, ample time will be afforded the boat's crew to adjust the gun to its concealed position and cover it with the jacket 23, before submergence proceeds far enough to flood the jacket. But even should the gun in some special case be left exposed until submergence is completed, the hand-wheels 15 and 27 may be operated from the interior of the hull to lower the gun on its standard into the superstructure space and then shift the jacket to envelop the gun, provided that before submergence the hand-wheel 21 has

been turned to arrange the gun vertically. The gun will then be protected at least from the effect of damaging water-currents, or a connection with a flexible air pipe may be provided so that the water in the gun casing can be blown overboard.

I claim:

1. In a submarine boat, a superstructure having an opening in the top thereof, a gun standard movably mounted in the superstructure beneath the opening, said gun standard comprising a platform on which said gun is mounted for rotation in a horizontal plane when said gun standard is elevated, means for adjusting said gun standard and said gun into and out of said opening, and a cover for said gun adjustable into and out of engagement with said platform to form therewith a water-tight covering for the gun.

2. In a submarine boat, a superstructure having an opening in the top thereof, a gun standard movably mounted in the superstructure beneath the opening, said gun standard comprising a platform on which said gun is mounted for rotation in a horizontal plane when said gun standard is elevated, means for adjusting said gun standard and said gun into and out of said opening, a cover for said gun adjustable into and out of engagement with said platform to form therewith a water-tight covering for the gun, and means operatable from within the hull for adjusting said cover and said gun standard.

3. In a submarine boat, in combination, a compartment provided with an opening in its top, a gun and means for aiming the gun emplaced in the compartment, means for moving the gun to protrude its muzzle through the opening for bringing the gun into position for use, a movable gun-sheathing device located between the superstructure and the hull, and means operable from within the hull for moving the gun-sheathing device to sheath the gun and for moving said device away from the gun to permit the gun-muzzle to be protruded through the opening.

4. In a submarine boat, in combination, a compartment provided with an opening in its top, a pivotally supported gun mount emplaced in the compartment, a gun on the mount, means for moving the mount to be concealed within the compartment and for moving the mount to protrude through the opening, means for arranging the axis of the gun substantially vertical when the standard is protruding through the opening whereby when the standard is moved to be concealed within the compartment the gun is moved to lie substantially horizontal for concealment within the compartment, a gun-sheathing device mounted for horizontal movement, and means operable from within the hull for moving the device to envelop the gun when it is arranged horizontally within the compartment.

5. In a submarine boat provided with a superstructure having an opening in its top, the combination of a gun-standard movably mounted below the superstructure and normally concealed within the superstructure space, a gun adjustably mounted on the standard, means operable from within the hull for moving the gun-standard to protrude the gun-muzzle through the opening, a gun-sheathing device located within the superstructure space, and means operable from without the superstructure space for moving the gun-sheathing device toward and away from the gun.

6. In a submarine boat provided with a superstructure having an opening in its top, the combination of a gun-standard movably mounted below the superstructure, a gun adjustably mounted on the standard, means operable from within the hull for shifting the gun-standard to project the gun through said opening, a gun-sheathing device located within the superstructure space, and means operable from within the hull for moving the gun-sheathing device toward and away from the gun.

7. In a submarine boat, in combination, a gun, a cavity for containing and concealing the gun, means for exposing the gun, aiming adjuncts permanently carried by the gun, a gun-sheathing means, and means operable from without the cavity for arranging the sheathing means to inclose the gun and the adjuncts in a water-tight envelop when the gun is concealed in the cavity.

8. In a submarine boat, in combination, a deck, a compartment below the deck and open to the sea and provided with an elongated opening in the deck, a spray-tight cover for the opening, a gun-standard pivotally mounted in the compartment and adjustable to protrude from the compartment or to lie within the compartment, a gun pivotally mounted on the standard for movement to a position in prolongation of the standard from its pivot and a water-tight jacket located within the compartment and movable to envelop the gun when the standard is concealed and the gun is arranged in prolongation of the standard.

9. In a submarine boat, in combination, a gun, a cavity for containing and concealing the gun, a mount carrying the gun and movable to protrude the gun-muzzle from the cavity, and a gun-sheathing means movable in the cavity to inclose the gun in a water-tight envelop when the gun is concealed in the cavity.

10. In a submarine boat, in combination, a gun, a cavity for containing and concealing the gun, a mount carrying the gun and movable to protrude the gun-muzzle from

the cavity, and a gun-sheathing means movable in the cavity to coöperate with the mount to inclose the gun in a water-tight envelop when the gun is concealed in the cavity.

11. In a submarine boat, in combination, a gun, a cavity for containing and concealing the gun, a mount carrying the gun and movable to protrude the gun-muzzle from the cavity, a gun-sheathing means movable in the cavity to inclose the gun in a water-tight envelop when the gun is concealed in the cavity, and means operable from without the cavity for moving the gun-sheathing means.

12. In a submarine boat, in combination, a gun, a cavity for containing and concealing the gun, a mount carrying the gun and movable to protrude the gun-muzzle from the cavity, a gun-sheathing means movable in the cavity to inclose the gun in a water-tight envelop when the gun is concealed in the cavity, and means operable from the hull interior for moving the gun-sheathing means.

13. In a submarine boat, the combination of a compartment provided with an opening in its top, a normally-closed cover for said opening having a spring-hinge connection with the edge thereof, a gun and gun-mount emplaced in said compartment, and means operable to raise the gun and gun-mount through said opening out of the compartment to expose the gun and to withdraw them through said opening into said compartment for concealment therein, said cover being engaged and gradually pushed upward and outward by the gun mount during the movement of the latter into exposed position, and gradually swinging inwardly and downwardly into closed position under the influence of its spring connection as the gun moves into its position of concealment.

14. In a submarine boat, a superstructure having an opening in its top, a cover for said opening hinged to the edge thereof, a gun and gun-standard comprising a platform on which said gun is mounted for rotation in a horizontal plane when the standard is elevated, means for shifting said gun and standard into and out of said opening, said platform being adapted to press against said cover and swing it into open position during the elevation of said standard, and a sheath for said gun disposed in said superstructure and adjustable into and out of water-tight engagement with said platform.

In testimony whereof I affix my signature.

THOMAS McCHEYNE GUNN.