

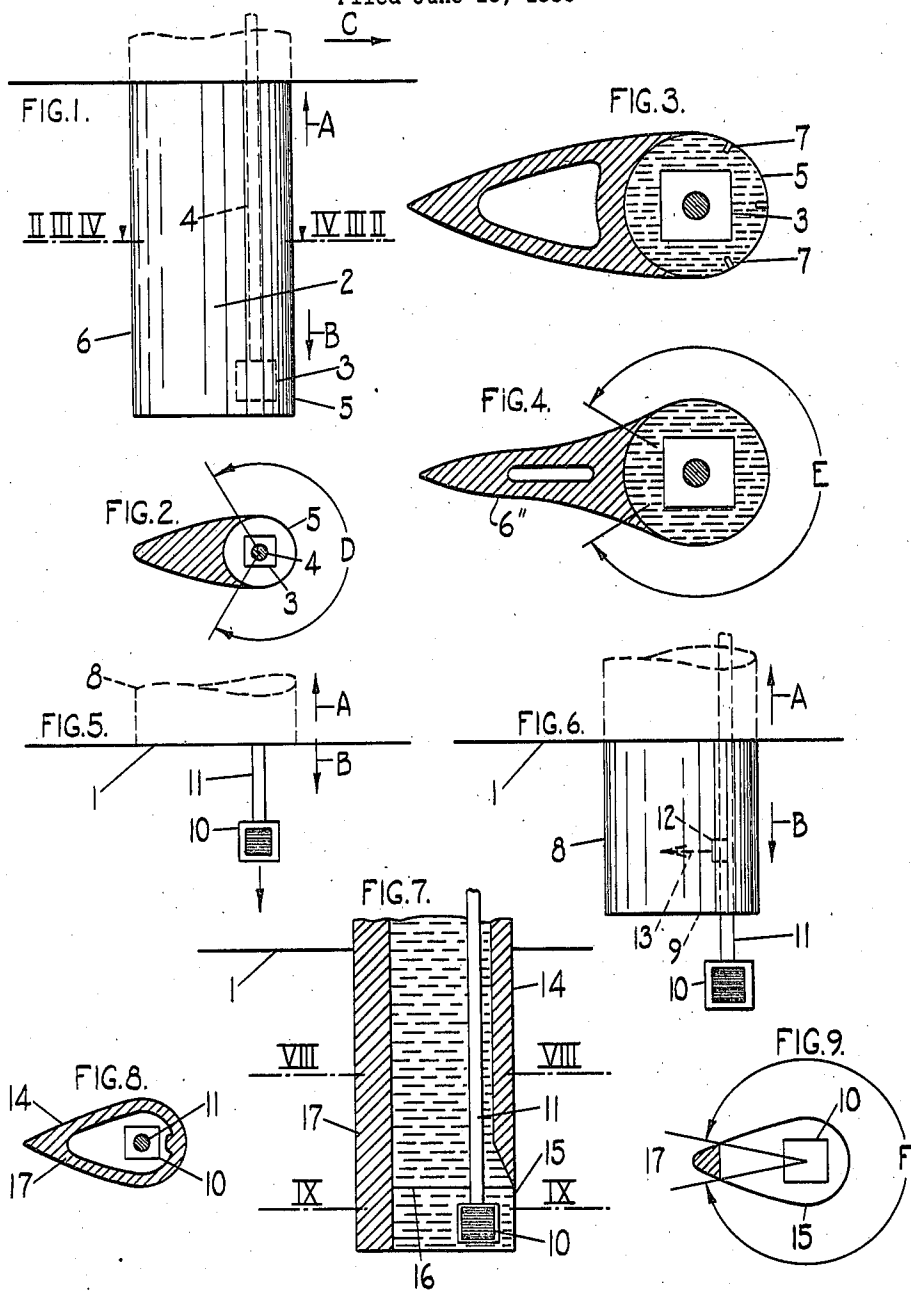
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PROJECTING MEANS FOR SUBMARINE SIGNALING APPARATUS

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PROJECTING MEANS FOR SUBMARINE
SIGNALING APPARATUSWilly Kunze, Bremen, Germany, assignor to Atlas
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The present invention relates to submarine signaling apparatus and more particularly to the installation of such apparatus in a vessel where the apparatus projects from the skin of the vessel or may be projected in the operation of the submarine signaling system.

When such apparatus is projected below the skin of the vessel, considerable pressure is impressed upon it when the vessel is in motion due to the water pressure built up by the moving ship. In high speed vessels this pressure is considerable and as a result the apparatus itself must be made sufficiently strong so that it can properly withstand the force and shocks to which it is at times subjected. This has been accomplished by designing the apparatus with a sufficiently thick wall to withstand the forces developed, but in doing so the walls substantially interfere with the transmission of the sound waves, particularly in the higher frequencies, and interfere with the best reception.

In the present invention these disadvantages are overcome in that the sound apparatus is practically as free as in the open water and the sound waves are not interfered with by a body of different characteristics than the water medium before the waves reach the submarine signaling apparatus. In addition to this, the arrangement may also act to protect the receiver from certain undesirable extraneous sounds and in this way insure a quieter listening field than would otherwise be possible.

The invention will be more clearly understood in connection with the drawing described below in which Fig. 1 shows a side view of a hull body incorporating the features of the present invention; Fig. 2 shows a cross section on the line II—II of Fig. 1; Fig. 3 shows a modified cross section taken on the line III—III of Fig. 1 in increased dimensions; Fig. 4 shows a cross section on the line IV—IV in accordance with a further modification on a larger scale; Figs. 5 and 6 show two different positions of the hull body; Fig. 7 shows a vertical section through a further form of construction of the hull body; and Figs. 8 and 9 show sections taken on the lines VIII—VIII and IX—IX of Fig. 7.

In the drawing 1 indicates a bottom of a vessel. 2 indicates the hull body or device containing the underwater sound gear 3 which is either made fast to the hull body 2 or rotatable within it by means of the shaft 4 and which likewise may be raised and lowered in the direction of the arrows A and B, respectively, as is indicated in the figure. The

arrow C indicates the direction of the ship's travel.

The hull body 2 is so positioned in relation to the direction of normal motion of the vessel that the front part 5 of the hull body is formed from thin metal, as indicated more clearly in Fig. 2, while the rear portion 6 is constructed as a solid heavy body with the stream line form as shown in Fig. 2. In this manner it is possible to insure a rigid support between the hull device and the ship's body even at high speeds of travel of the ship.

In the section shown in Fig. 3, which may be an enlarged section of the device indicated in Fig. 1, the front part of the hull body may be made of a thin metal tube which may in any desired manner be joined with the rear stream-lined portion 6' to furnish strength for the structure. In order to increase the strength of the front wall portion of the tube, ribs 7 may be employed which may be kept sufficiently small so that no interference with the receiver may be present, such, for instance, as the causing of a sound shadow due to the sound beam being picked up by the body in front of the receiving element.

In Fig. 4 a somewhat different construction is shown than that in Figs. 2 and 3, but only to the extent of the rear thick supporting element which in the case in Fig. 4 is somewhat more narrow than that shown in Fig. 3 and thereby permits the reception of the sound receiver over a larger angular range as indicated in Fig. 4 by the arc E. The hull body in the present invention is so made that the sound approaching from the aft direction of the vessel will not efficiently reach the receiving unit and this is more of an advantage than a disadvantage because, due to the churning of the water by the propeller and the effects of water eddies due to the vessel itself, the rear of the vessel not only prevents sound from passing through the water beneath it to the receiving unit, but also generates and produces a substantial amount of noise which is detrimental to quiet listening from other forward directions.

In the modifications indicated in Figs. 4 and 5 it is intended to use the ordinary mechanism well known in the art for hoisting and lowering the shaft 8 and it is further intended to arrange the shaft 11 on which the sound receiving element 10 is mounted so that it, too, may independently, if desired, be hoisted within the vessel or lowered beneath the hull body as indicated in Fig. 6. The hoisting and lowering mechanism commonly used in this art may be employed for this purpose. In addition to this, provision may be made

whereby the end of the receiving unit 10 may be withdrawn within the hull body as indicated by the direction of the arrow 13 at the point of support 12 for the receiving unit. This may be accomplished in any well known manner, as for instance, in United States Patent No. 1,719,937. It will be obvious that in this arrangement various combinations may be employed and the listening apparatus may be positioned within the hull body or externally to it at distances which may prove best under the conditions encountered.

It will also be noted that the arrangement indicated in Fig. 1 may be closed at the bottom whereas that shown in Figs. 5 and 6 are preferably open or open at such a point where the sound receiver can be projected through.

In the arrangements indicated in Figs. 7, 8 and 9 the hull body, as indicated, may be opened at the bottom and be provided with a heavy wall 17 at one side and a lighter wall 14 at the front side, the wall 14 being tapered to a thin sheet such as indicated at 15 shown more clearly in Fig. 9. In Fig. 8 the section along the line VIII—VIII is indicated showing the shape and thickness of the front portion 14 and indicating also how far this wall extends to the rear.

From the section shown in Fig. 9 it will be evident that the angle of reception of the receiver 10 embraces the large angle F and makes it possible to listen practically entirely around the whole horizon except for the small section in the direction of the rear of the vessel.

It may also be noted that the section in accordance with Fig. 2 shows the angle D indicating a smaller angle of reception than those of Figs. 4 and 9. In special cases of construction the entire bottom of the hull body, as indicated in Fig. 7, may be made of thin metal where the length is sufficiently short so as to provide sufficient strength under the conditions to which the apparatus may be employed.

It is quite evident that various shapes of stream-lined surfaces may be employed and those in particular which will provide stream-lined effect for the water passing over the front surface,

the general shape of which, however, is that as indicated in Figs. 2, 3 and 4. The underwater apparatus can, of course, be made directional and rotated about its vertical apparatus in order to select the direction from which the sound returns with greatest intensity and, in fact, the device may be used for transmission, particularly the transmission of a directive beam, in a similar manner.

Having now described my invention, I claim:

1. A device for submarine signaling adapted to project from a vessel comprising a shaft having a hollow section and being streamlined with the forward portion forming a thin wall and the rear portion a thick wall, and sound-signaling means positioned within said hollow section near the thin wall thereof.

2. A device for submarine signaling adapted to project from a vessel comprising a hollow shaft having transverse streamlined sections, said shaft being comparatively thick and tapered on one side and having a comparatively thin wall on the opposite side, sound-signaling means placed within the hollow section of said shaft and means filling the hollow section with a medium to allow sound to be conducted to said sound-signaling means.

3. A device for submarine signaling adapted to project from a vessel comprising a hollow shaft having transverse streamlined sections with one portion tapered to a small end and having a comparatively thick wall and the other portion having a thin wall, said shaft being open at the bottom, and sound-signaling means positioned near the lower open end of the shaft.

4. A device for submarine signaling adapted to project from a vessel comprising a shaft having transverse streamlined sections with a rounded forward portion and a rear portion tapering to a small end, said rear portion having a hollow section therein and said forward portion having a cavity behind the rounded section and sound-signaling means positioned in said cavity.

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