May 30, 1950 G. A. SILVEY 2,509,943

MARKER FLARE

Filed March 10, 1947

FIG. 1

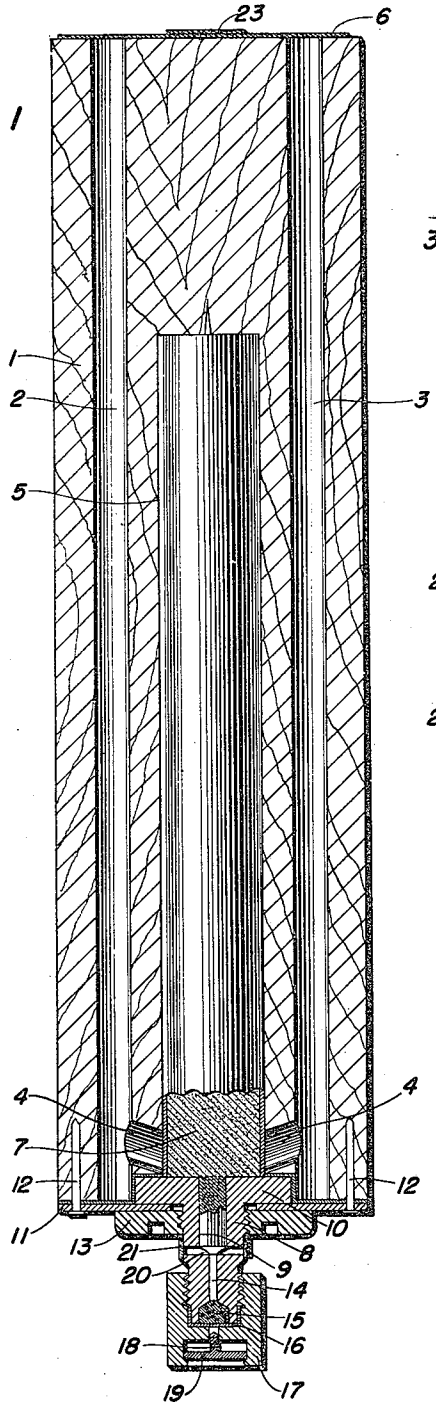


FIG. 2

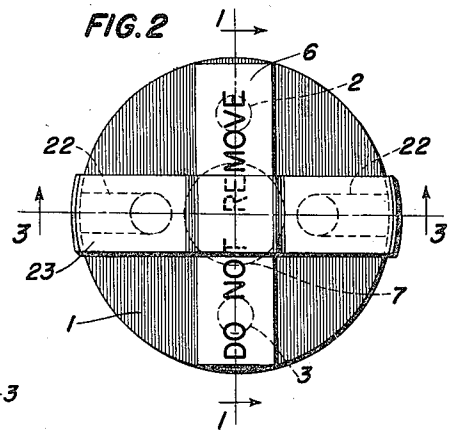


FIG. 3

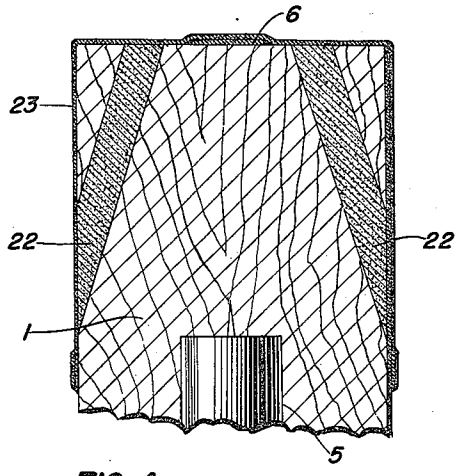
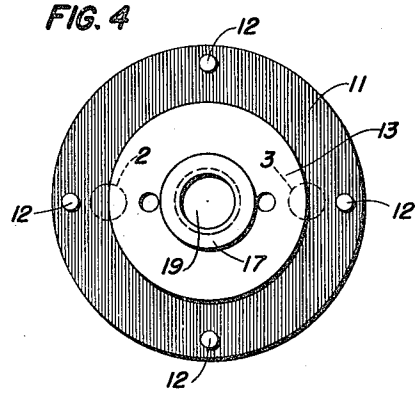


FIG. 4



INVENTOR

GENE A. SILVEY

BY S. D. O'Brien

ATTORNEY

Patented May 30, 1950

2,509,943

UNITED STATES PATENT OFFICE

2,509,943

MARKER FLARE

Gene A. Silvey, Seattle, Wash., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Navy

Application March 10, 1947, Serial No. 735,591

1 Claim. (Cl. 102—7)

1

The present invention relates to marker devices and more particularly to an improved marker flare for use in testing torpedoes which are equipped with an influence type of detonating or exploding mechanism.

An object of the invention is to provide an improved marker device which will function to indicate the location of a test torpedo, equipped with an influence type of detonating or exploding mechanism, at the time such influence mechanism operates.

Another object of the invention is to provide an improved buoyant marker flare designed to be simultaneously discharged from a test torpedo of the character described and ignited to indicate the location of operation of the influence mechanism by means of a smoke signal.

Another object of the invention is to provide an improved non-explosive starting mixture for use in the ignition assembly of a flare.

Another object of the invention is to provide an improved buoyant marker device designed to be discharged from a test torpedo of the character described and to color the surface of the water to indicate the location of operation of the influence mechanism.

Another object of the invention is to provide an improved buoyant marker flare designed to be simultaneously discharged from a test torpedo of the character described and ignited to produce a smoke signal and in addition designed to color the surface of the water to indicate the location of operation of the influence mechanism by means of the smoke signal and/or the colored area of the water.

A further object of the invention is to provide a marker flare of the character described which is sturdy, simple to construct, and economical of manufacture.

Other objects of the invention will become evident from the following description taken in connection with the accompanying drawing and it will be evident that many changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention as expressed in the accompanying claim. Therefore, the invention is not to be limited to the exact details of construction and arrangement of parts shown and described, as only the preferred form has been shown and described by way of illustration.

In the accompanying drawing:

Fig. 1 is a longitudinal sectional view of the marker flare taken on the plane indicated by the line 1—1 of Fig. 2.

2

Fig. 2 is a plan of the discharge end of the marker flare.

Fig. 3 is a fragmentary sectional elevational view of the discharge end of the marker flare taken on the plane 3—3 of Fig. 2.

Fig. 4 is a view of the lower end of the marker flare.

The present invention relates to a flare which is used primarily in testing torpedoes which are equipped with an influence type of detonating or exploding mechanism. The purpose of the flare is to indicate the position of the test torpedo relative to the target when the influence-operated mechanism has functioned. This is accomplished by the flare being projected from the test torpedo by means of a flare gun, the gun being controlled by said influence-operated mechanism. This gun not only projects the flare but simultaneously ignites the fuze as will be shown below.

The marker flare comprises a cylindrical block of wood or other buoyant material 1 through which extend longitudinally two discharge flues 2 and 3 opening at their lower ends by short ducts 4 into an axial bore 5. The discharge ports at the upper or discharge ends of these flues are initially closed by means of a protective strip 6 of adhesive tape, of such nature that it may be removed from the ports by the action of the water, or by pressure from within the flare, after it has been launched under water. The axial bore 5 contains a pyrotechnic charge 7 or smoke mixture of a slow-burning powder in a retaining protective tube of zinc, lead or the like. Such smoke charges are well known and are used in numerous applications.

The lower end of the charge becomes ignited when the marker flare is discharged from the flare gun carried by the torpedo and the slow-burning powder emits a black smoke that passes through the ducts 4 into the flues 2 and 3. After the tape 6 has been removed and the upper end of the marker flare has emerged above the water surface, the black smoke rises from the flue in two columns that merge to form the smoke signal.

An ignition assembly for activating the charge 7 is mounted on the lower end of the block 1. This assembly includes a metallic stud or body 8 having an interior bore 9 containing a primer. The stud is fashioned with an integral circular disk 10 forming an attaching flange, which is seated in a recess in the base of the block 1 to position and retain the powder charge 7 in the block. The integral disk or attaching flange 10 is retained

in the said recess by means of a circular cover plate 11 which is secured to the block 1 by the nails 12. Wax or an equivalent material is preferably applied to the joints between the various parts in the ignition assembly in the base of the marker to render the assembly substantially waterproof. To insure a compact and effectively sealed joint between the ignition assembly and the block 1, the stud 8 is externally threaded to receive a nut 13 that rigidly clamps over the cover plate 11 and attaching flange 10, and reinforces the plate as a support for the assembly.

The bore 9 which opens to the charge 7 contains a suitable primer or non-explosive starting mixture that may include a slightly nitrated cotton wad. A satisfactory starting mixture consists of:

	Percent by weight
Sulphur	17
Antimony	16
Potassium nitrate	42
Lead dioxide	25

The bore 9 in the stud 8 has a reduced extension forming a port 14 which terminates in an enlarged chamber carrying a percussion charge 15. A cup 16 of soft frangible metal provides a waterproof seal for the charge 15. A metallic cap 17 which threads upon the stud 8 seals the cup 16 in position. The cap 17 is recessed at is outer end to receive and retain a relatively movable firing pin 18 having an enlarged head or disk 19. The pin 18 which is slidable in a port that is aligned with the port 14, is shown in retracted position in Fig. 1. As the marker flare is discharged from the gun, the propelling force of the discharge impinges upon the head 19, thereby driving the pin 18 through the thin wall of the soft metal cup 16 into the percussion charge 15. The starting mixture or primer in the bore 9 is thereby ignited, which in turn ignites the main pyrotechnic charge or smoke mixture. To vent the bore of the stud 8 to release excess gases of ignition, lateral ports 20 are provided in the stud. These vent ports are initially closed by a strip of adhesive tape 21 wrapped around the ported stud. When the marker flare is projected from the torpedo, the action of the water on the adhesive and/or the pressure produced in the bore of the stud is sufficient to uncover the ports 20.

In addition to the black smoke signal created by the burning charge and arising from the two flues 2 and 3, means are also provided for coloring the surface of the water over the area in which the influence mechanism of the test torpedo has just functioned. This is accomplished

by the provision of two diagonally arranged bores 22 each of which contains a dye material initially retained in the bores by a strip of adhesive tape 23. The adhesive of this tape being readily water-soluble, the dye material in the bore 22 is soon exposed to the water, inasmuch as the lateral ports of these diagonal bores are below the waterline of the flare. This dye material thus exposed dissolves in the water to color the surface thereof to indicate the area into which the marker was projected and in which the influence mechanism of the torpedo operated.

What is claimed is:

In a marker flare designed to be projected from an under-water location by means of a flare gun, the combination of a buoyant cylindrical wooden block, said block having an axial bore extending through one end of the block but terminating short of the other end, having also two symmetrically placed longitudinal bores extending from end to end of the block between the axial bore and the outer surface of the block, and having further a pair of transverse bores respectively connecting the axial bore, near its open end, to the adjacent ends of said longitudinal bores, a closure disk secured to the corresponding end of the block and covering the said last-named ends of the longitudinal bores, a cartridge containing a smoke-producing pyrotechnic composition and housed in said axial bore, weighted means carried by said disk to cause the block to float with the weighted end down when placed in water percussion-actuated igniting means for the pyrotechnic composition, also carried by said disk, and sealing means, removable by contact with water, temporarily closing the remaining pair of ends of the longitudinal bores.

GENE A. SILVEY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,114,213	Clauser	Apr. 12, 1938
2,119,697	Anderson	June 7, 1938
2,263,585	Moore et al.	Nov. 25, 1941
2,338,719	Holt	Jan. 11, 1944
2,409,380	Nichols	Oct. 15, 1946
2,410,801	Audrieth	Nov. 12, 1946
2,470,783	Mead	May 24, 1949

FOREIGN PATENTS

Number	Country	Date
183,781	Germany	May 7, 1907