Nov. 8, 1955 F. M. JOHNSON 2,722,696

LIGHTED RESCUE LIFE LINE

Filed Jan. 30, 1953

FIG. 1

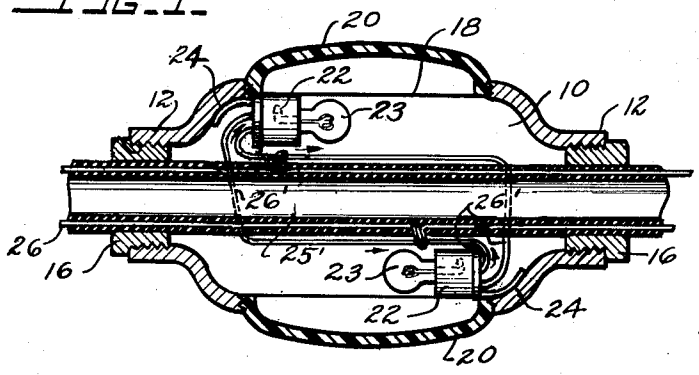


FIG. 2

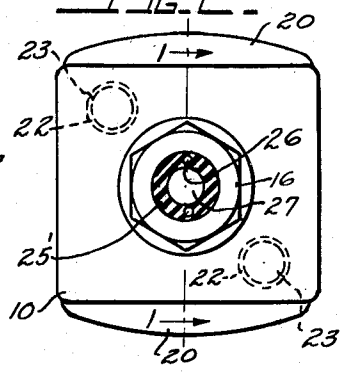


FIG. 3

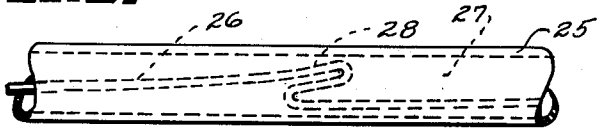


FIG. 4

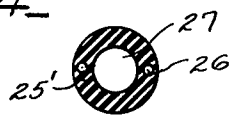
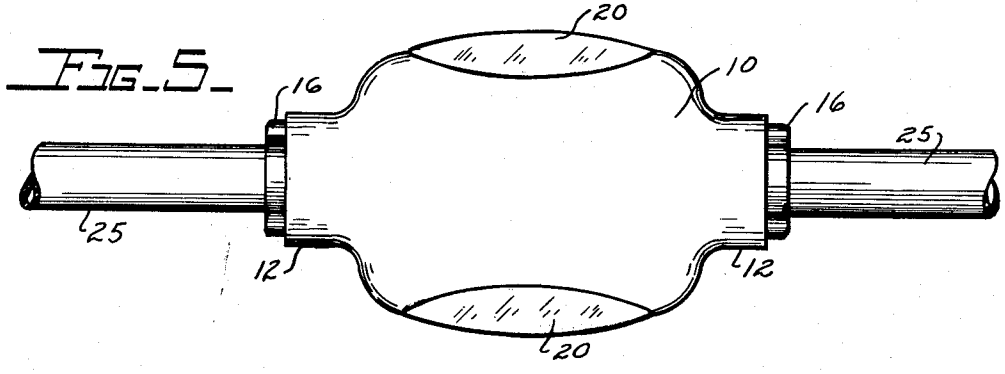


FIG. 5



INVENTOR.
FRANCIS M. JOHNSON
BY Wade Kenty AND
Frederick W. Cottleman
ATTORNEYS

United States Patent Office

2,722,696

Patented Nov. 8, 1955

2,722,696

LIGHTED RESCUE LIFE LINE

Francis M. Johnson, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the United States Air Force

Application January 30, 1953, Serial No. 334,383

8 Claims. (Cl. 9—14)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the United States Government for governmental purposes without payment to me of any royalty thereon.

This invention relates to floating life lines and particularly to illuminated buoyant life lines which are adapted for surface rescue work.

Life lines as presently constructed are relatively crude, being made of either hemp, sisal or cotton rope and provided with floats to keep them on the surface. Since they are without adequate lighting means their visibility is poor, and when made of these materials their life is extremely short.

These shortcomings existing in conventional designs are overcome in the life line hereinafter shown and described, in which a series of miniature light bulbs are longitudinally spaced apart, a flexible tubular conduit with waterproof receptacles or housings surrounding the conduit and bulbs and with electrical conductors for the bulbs either extending through the main opening in the flexible tubular conduit or woven in the walls of the flexible tubular conduit.

The manner in which this structure is achieved is hereinafter described, reference being had to the drawing, wherein:

Fig. 1 is a vertical axial section taken at **1—1** of Fig. 2 through one of the light receptacles with two miniature light bulbs mounted on and electrically connected within the receptacle.

Fig. 2 is a right-hand end view of Fig. 1.

Fig. 3 shows a section of a conventional hollow flexible conduit upon which the receptacles may be spaced apart and secured with the electrical conductor on the interior.

Fig. 4 is a cross section through a hollow flexible conduit in which the conductive wires are imbedded and adapted to be looped at intervals and sealed within the walls of the conduit, so that the looped portions can be drawn through apertures when formed in the walls inside of the receptacles.

Fig. 5 is a full line view of a receptacle **10** looking in the same direction as when viewing Fig. 1.

Like reference characters refer to like parts throughout the several views.

In the drawings a housing or receptacle **10** has bulbs **12**, one at each end. Hubs **12** are internally threaded to fit the external threads on the seal type lock nuts **16**. The receptacle **10** may preferably be made of molded plastic or synthetic flexible rubber and must be leakproof when assembled.

The conventional type hose or conduit **25** which may be passed through the receptacle **10** and sealed thereto at both ends by the seal nuts **16** is shown in plan in Fig. 3, while the special type hose **25'** is shown in cross section in Fig. 4. As a simple method of practicing my invention (see Fig. 3) electrically conductive line wires **26** may be strung through the center opening **27** of a conventional flexible buoyant conduit and turned back upon itself as at **28** approximately every six feet, as shown, to allow for making the electrical connections **26'** to the sockets exteriorly of the conduit, or, as a more approved method, the line wires **26** may be molded into the wall of the conduit **25'** as shown in Fig. 4. In practicing the approved method, one loop is pulled out from the positive line wire, and another from the negative, and bulb connections soldered to the loops. The second method has only the slight disadvantage that the line wires in Fig. 1 are more effectively separated from the water which may leak past the seals, and water cannot reach the buoyant interior of the conduit.

Opposite sides of the receptacle **10** are slabbed off as at **18** and the openings thus formed are internally threaded for the externally threaded covers **20**. Transparent covers or lens **20** may preferably be made of clear type plastic or glass. The joints between the body of the receptacle **10** and the covers **20**, as well as the joints between the internal and external threads of the hub **12** and seal **16**, must be fully sealed waterproof.

Small bayonet-lock type of lamp sockets **22** containing bulbs **23** are mounted on fixed, preferably molded-in brackets **24** within the receptacles. Small holes may then be punched through the wall of the flexible conduit **25** or **25'** and the loops of the line wires **26** or **26'** brought out through these small holes and connected to the lamp sockets **22** with leads **26'**.

While the dimensions of the novel buoyant life line herein disclosed may be varied to suit different situations and conditions, a diameter of one half inch O. D. with five-sixteenths inch hole for the conduit is thought to have the widest application. The material for the conduit may be either buoyant material such as undrawn nylon, or inflatable flexible tubing such as rubber, plastic or the like.

Whichever material is used, the lights may preferably be spaced approximately six feet apart and while, in Fig. 4 of the drawing, the lighting conductors are shown as woven in the wall of the conduit with the looped portions extending outwardly therethrough, a satisfactory arrangemen may comprise a flexible waterproof inflatable conduit in which the wires are strung in the interior bore or openings of the conduit as in Fig. 3. In either situation the necessary length of conductor for making the connections is obtained by lapping the cable back upon itself to form loops as at **28**, Fig. 3, for making the electrical connections thereto.

The life line, when in use, is payed out and towed in back of the rescue ship through the area being searched, the same ship being arranged to provide electric current for the lights and if necessary air pressure can be supplied to the interior of the conduit, where that is needed to keep the line afloat.

While two bulbs per station is preferable and is recommended, a single bulb for each station may, under certain conditions, give satisfactory results. In either case the line may preferably be approximately one hundred fifty feet long and made of material light enough in weight with its hollow interior to make it self-buoyant and having a covering of white or other light color to provide visibility.

The lights may be powered by the towing craft, the current being either six, twelve, twenty-four or one-hundred ten volts. The device should be properly stressed to allow towing through the water at thirty knots and be able to lift a six hundred pound weight.

The looped porions also provide expansion means at intervals along the conduit for the electric supply wires, so that no undue longitudinal stress or stretch will be applied to the electrical conductors should the conduit

itself be stressed longitudinally to cause slight longitudinal stretching thereof.

Having described an embodiment of my invention, I claim:

1. An illuminated rescue life line comprising a hollow elongated flexible watertight buoyant conduit means, a plurality of hollow lamp receptacles disposed on said conduit means at predetermined spaced intervals throughout the length of the conduit means with the conduit means extending through the receptacles, watertight sealing means between the opposite ends of each receptacle and the conduit means for sealing the receptacles watertight at their ends to the conduit means, a window fixed watertight in the side of each receptacle intermediate its watertight sealed ends, an electric lamp fixed within each receptacle in back of said window, flexible electrical conductor means extending longitudinally within the flexible conduit means for substantially the length of the conduit means and formed with looped portions located within the receptacles connected to said electrical lamps for illumination thereof when the conductor means is energized.

2. An illuminated rescue life line comprising a hollow elongated flexible watertight buoyant conduit means, a plurality of hollow lamp receptacles disposed in longitudinally spaced relation on said conduit means at predetermined intervals throughout the length of the conduit means with the conduit means extending through the receptacles, watertight sealing means between the opposite ends of each receptacle and the exterior of the conduit means for sealing the interiors of the receptacles watertight at their opposite ends to the conduit means, a window fixed watertight in the wall of each receptacle intermediate its watertight sealed ends, an electric lamp socket fixed to the interior wall of the receptacle back of said window and adapted to receive an electric lamp therein, a pair of flexible electrical conductors extending longitudinally within the flexible conduit means in spaced relation to each other for substantially the length of the conduit means, said electrical conductor means each being formed with looped portions each located within one of said receptacles and connected at its end to the contact terminals of the electric lamp sockets for energizing the sockets to illuminate the electric lamps when placed in said sockets.

3. Apparatus as claimed in claim 1 in which the electrical conductor means is located in the wall of the conduit means between the inner and outer surfaces thereof and said looped portions extend outwardly through apertures formed in the outer wall of the conduit means within the receptacles, and connected at the ends of the looped portions to the electric lamps.

4. Apparatus as claimed in claim 2 in which the two electrical conductors are located in the wall of the conduit means between the inner and outer surfaces thereof in spaced relation to each other and the ends of the loop portions of the electrical conductors extend through openings provided therefor in the outer wall of the conduit means located within the receptacles and connected to the electrical contacts of said lamp sockets.

5. In an illuminated, flexible life line, a flexible tubular buoyant conduit forming the life line and adapted to be closed at its opposite ends to prevent the escape of air from within the conduit, a plurality of lamp inclosing receptacles mounted on said conduit in spaced relation to each other, each receptacle formed with openings at its opposite ends to receive the conduit through said openings, an electric lamp fixed in each of said receptacles, a removable access window fitted watertight in said receptacle in front of said lamp, electrical conductor means for energizing and illuminating said lamps extending longitudinally within said conduit throughout substantially the entire length thereof, said electrical conductor extending through the outer wall of the conduit intermediate the openings in the ends of each receptacle and connected within the receptacle to the electric lamp therein, and sealing means between the exterior wall of the conduit and the openings in the ends of the receptacle to seal the interior of the receptacles watertight on said conduit.

6. Apparatus as claimed in claim 5 in which the electrical conductor means is formed with a plurality of slack portions to provide slack in the length of the electrical conductor means and at least one of said slack portions is located within each of the lamp receptacles between the ends thereof and extends through the outer wall of the conduit at a point within the receptacle between the opposite ends thereof and the end of the loop portion is electrically connected to the electrical lamp to illuminate the same when the electrical conductor is energized.

7. Apparatus as claimed in claim 5 in which the electrical conductor means comprises two electrical conductor wires extending longitudinally within said flexible conduit in spaced relation to each other and formed with slack extension portions located within each of the receptacles in the form of loop portions extending through the outer wall of the conduit into the interior of the receptacles at spaced points and connected substantially at the ends of the looped extension portions to the contact terminals of the electrical lamps within the receptacles, one electrical conductor loop extension being connected to one contact of each electric lamp and the other electrical conductor loop extension being connected to the other electrical lamp conduit for connecting the lamps within the receptacles in parallel throughout the length of the life line.

8. Apparatus as claimed in claim 5 in which the electrical conductor means comprises two electrical conductor wires extending longitudinally within the said flexible conduit in spaced relation to each other and formed with extension portions located within each of the receptacles extending through the outer wall of the conduit into the interior of the receptacles at spaced points and connected substantially at the ends of the extension portions to the contact terminals of the electrical lamps within the receptacles, one electrical conductor extension being connected to one contact of each electric lamp and the other electrical conductor extension being connected to the other electrical lamp contact for connecting the lamps within the receptacles in parallel throughout the length of the life line.

References Cited in the file of this patent

UNITED STATES PATENTS

1,174,594	McGiff	Mar. 7, 1916
2,368,558	Maloney	Jan. 30, 1945
2,642,591	Craver	June 23, 1953

FOREIGN PATENTS

312,464	Great Britain	May 30, 1929
470,816	Great Britain	Aug. 18, 1937