

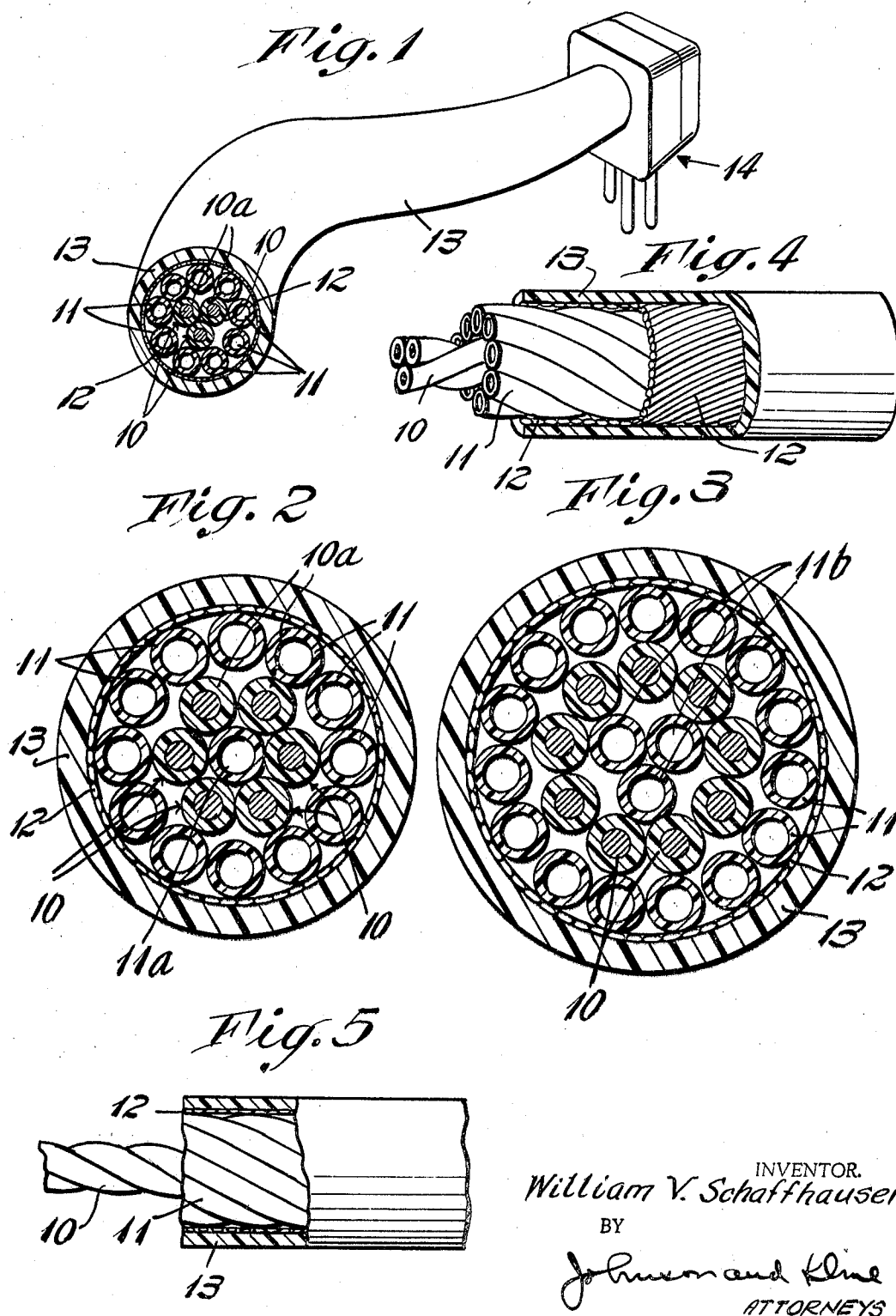
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W. V. SCHAFFHAUSER

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FLOTATION CABLE

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INVENTOR.
William V. Schaffhauser
BY
Johnson and Kline
ATTORNEYS

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FLOTATION CABLE

William V. Schaffhauser, Norwich, Conn., assignor to Plastic Wire & Cable Corporation, Jewett City, Conn., a corporation of Delaware

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5 Claims

ABSTRACT OF THE DISCLOSURE

A flexible flotation electrical cable comprising a plurality of electrical conductors enclosed in a flotation layer comprising hollow plastic flotation tubes helically disposed about a plurality of electrical conductors, a binder layer over the flotation layer and an enclosing flotation cable cover of waterproof and weather-resistant thermoplastic material thereover, the cable being capable of supplying power to units performing underwater operations without interference by said cable.

An object of the invention is to provide a simple, efficient, flexible flotation electrical cable which can be readily manufactured on existing equipment, lends itself to wide variation in its makeup to meet different requirements of power supply, buoyancy and flexibility as required, and can be easily manipulated and reeled as necessary.

A feature of the invention resides in the fact that the present cable, when used with a self-propelled cleaner for the bottom of swimming pools will not interfere with the cleaning operation because it will float above the bottom of the pool.

Another feature of the invention resides in the fact that when used with underwater power tools and the like, it will not interfere with the use of these tools and will also permit rapid retrieval of the tools due to its flotation properties.

A further feature of the invention resides in the versatility of the cable and the ease with which the elements thereof can be adjusted to permit varying power, flexibility and buoyancy requirements without substantial alteration of the usual cable machinery.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the accompanying drawings in which:

FIGURE 1 shows a portion of a cable with a fitting attached to the end.

FIG. 2 is a cross-section of another form of cable.

FIG. 3 is a cross-section of a still further form of cable.

FIG. 4 is a view partly in section showing the lay of conductors and the lay of flotation tubes extending in opposite directions.

FIG. 5 is a view of the cable showing the lay of the conductors and the lay of flotation tubes extending in the same direction.

As shown in the drawings, the cable of the present invention comprises a plurality of electrical conductors 10 surrounded by a plurality of flotation tubes 11 held in place by a binder layer 12, which binder layer is enclosed by a flexible cover 13 of waterproof or weather-resistant material and has its ends sealed to the usual fitting 14.

The conductors are flexible and are preferably covered by a flexible insulation 10a, preferably a thermoplastic resin. The flotation tubes 11 are continuous hollow tubes, preferably extruded of a thermoplastic material and which extend for the full length of the cable. At present preferred, the tubes are made of a polyethylene material because of its low specific gravity. Since the hollow tubes

are sealed off at each end by the fitting 14 or the like device to which they are connected, they provide a highly efficient flotation layer. The binder layer 12 may take various forms, such as the usual cable tape or a suitable strand material wound over the flotation layer. The outer cover or jacket 13 is preferably extruded from a suitable thermoplastic material over the bound assembly. Although this cover may be rubber (natural or synthetic) or of thermoplastic resins such as polyethylene, nylon or the like, it is presently preferred to use a polyvinyl chloride material which, in addition to providing a weather and water resistance, is also flame resistant.

While the flotation tubes can vary in diameter so long as the geometry of the cable elements produce the round cable cross-section, they preferably have a diameter substantially equal to the diameter of the insulated conductors so that they can be run through the usual cable-making machine which will twist the components together into a compact finished flotation cable with the conductors and tubes arranged to provide the required power supply and buoyancy.

For example, in the form of the invention shown in FIG. 1, three conductors 10 are helically twisted together to form a core and nine flotation tubes 11 are twisted into a helical layer around them. The flexibility of the cable can be controlled by the manner in which the components are assembled. If the lay or helical twist of the conductors and the flotation tubes is in the same direction as shown in FIG. 5, the cable will be more flexible than if the lay in the two layers is in opposite directions as shown in FIG. 4. Also, the shorter the pitch of the helix, the more flexible the cable will be.

In the form of the invention shown in FIG. 2, the cable includes a central flotation tube 11a around which six conductors 10 are twisted to form the core and twelve flotation tubes are twisted around the core and form the helical buoyant layer. In the form of the invention shown in FIG. 3, three central hollow flotation tubes 11b are twisted together in the same manner as the conductors of FIG. 1. Around these central tubes there are twisted nine conductors to form the core and fifteen flotation tubes are twisted to form a helical layer surrounding the nine conductors. In each of these forms the direction of twist in each component can be in the same direction or reverse direction as required. Also, if fewer conductors and more buoyancy is needed, some of the conductors can be readily replaced by flotation tubes without modifying the apparatus used in making the cable.

Thus, a highly efficient flotation cable of simple construction is provided which can be readily varied to meet different needs for power, buoyancy and flexibility and which can be easily made on existing cable-forming equipment.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. A water-buoyant, flexible, insulated electric cable including a central core comprising a plurality of insulated electrical conductors axially disposed within the cable, a buoyant layer surrounding said core and comprising a plurality of elongate, hollow flexible plastic tubes extending longitudinally of the cable, binder means surrounding the core and tubes to maintain them in assembled relation, and a protective-water-resistant jacket covering the assembly, said central core including an inner core comprising a plurality of hollow plastic tubes helically twisted together and said plurality of helically disposed insulated conductors helically disposed around said inner core, and the hollow tubes in said buoyant layer are helically disposed in side-by-side relation around said central core.

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2. A water-buoyant, flexible, insulated electric cable including a central core comprising a plurality of insulated electrical conductors axially disposed within the cable, a buoyant layer surrounding said core and comprising a plurality of elongate, hollow flexible plastic tubes extending longitudinally of the cable, binder means surrounding the core and tubes to maintain them in assembled relation, and a protective water-resistant jacket covering the assembly, said insulated conductors and said hollow plastic tubes of said core and said buoyant layer are each disposed in side-by-side relation and are helically twisted with a predetermined lay to provide for controlled flexibility of said cable.

3. The invention as defined in claim 2 wherein the lay of the twisted conductors and the twisted plastic tubes are in the same direction.

4. The invention as defined in claim 2 wherein the lay of the twisted plastic tubes is in the reverse direction to the lay of the twisted conductors.

5. The invention as defined in claim 2 wherein said cable and the hollow tubes therein are sealed at each end.

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E. A. GOLDBERG, Primary Examiner

U.S. Cl. X.R.

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