No. 657,196. Patented Sept. 4, 1900.

T. GUILLEAUME.

SUBMARINE CABLE.

(Application filed Oct. 19, 1899.)

(No Model.)

Fig. 1.

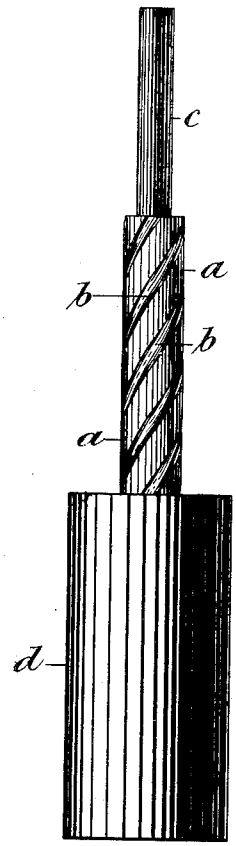


Fig. 3.

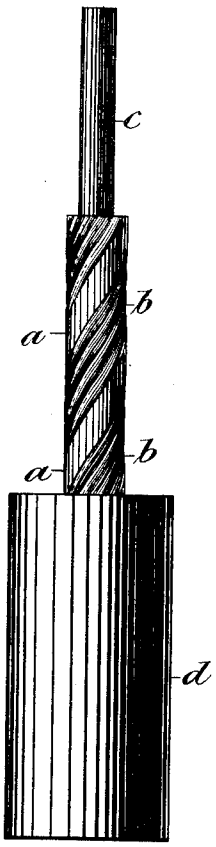


Fig. 5.

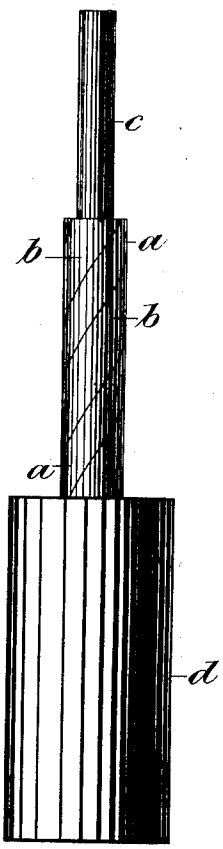


Fig. 2.

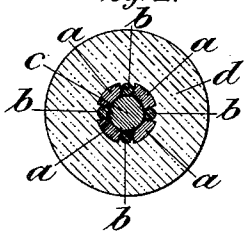


Fig. 4.

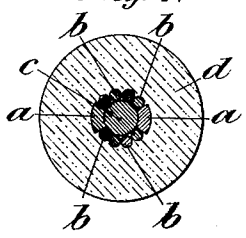
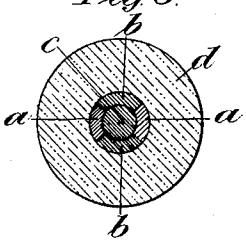


Fig. 6.



Witnesses.

Georg Müller.

Otto Pick

Inventor.

Thurdre Guilleaume

UNITED STATES PATENT OFFICE.

THEODORE GUILLEAUME, OF MÜLHEIM-ON-THE-RHINE, GERMANY.

SUBMARINE CABLE.

SPECIFICATION forming part of Letters Patent No. 657,196, dated September 4, 1900.

Application filed October 19, 1899. Serial No. 734,072. (No model.)

To all whom it may concern:

Be it known that I, THEODORE GUILLEAUME, a subject of the German Emperor, residing at Mülheim-on-the-Rhine, in the German Empire, have invented certain new and useful Improvements in Submarine Cables, (in respect whereof I have caused a patent to be applied for in Germany on the 24th of June, 1899, and in Great Britain, to bear date 12th of July, 1899, No. 14,408,) of which the following is a specification.

This invention relates to an improved method of constructing long cables intended for submarine use and of the kind in which the conductor is composed of a number of small wires laid up about a central wire or core, with a view to imparting flexibility to the conductor, the object of the present invention being to reduce the "capacity" in cables of this type and to enable the speed of working them to be increased.

In long submarine cables the speed of working is seriously restricted by the great electrostatic capacity of india-rubber and gutta-percha, no other insulating medium being, however, in other respects so suitable for use in long submarine cables. With a view to reducing the capacity when the conductor is of the "built-up" type it has been proposed to employ outer wires which are either flat or are shaped as segments of an annulus, so as to render the external surface of the conductor smooth. In order to still further reduce the capacity, the self-induction of the conductor is, according to the present invention, increased. This is accomplished by laying up around the central wire or core a number of wires composed of iron or other magnetic metal or a number of such wires arranged alternately or otherwise grouped with copper wires. In either case the outer wires, whether of copper, iron, or other magnetic metal, may be flat in form or may be shaped as segments of an annulus, so as to impart a smooth outer surface to the compound conductor, or some of the outer wires may be cylindrical and others segmental in cross-section, while the core, instead of consisting of a single wire, may be composed of a number of small copper wires laid up about a central wire of copper or other metal of high conductivity.

Examples of different modes of constructing cables according to the present invention are illustrated in the accompanying drawings, whereof—

Figure 1 is a side elevation, and Fig. 2 a transverse section, of a cable in which a number of "shaped" and cylindrical wires of copper and iron, respectively, are laid up alternately around a cylindrical core-wire. Fig. 3 is an elevation, and Fig. 4 a transverse section, of a cable in which a number of cylindrical wires of iron disposed between shaped wires of copper are laid up around a cylindrical core-wire. Fig. 5 is an elevation, and Fig. 6 a transverse section, of a cable wherein both the copper and the iron conducting-wires constituting the outer group are of the shaped type before referred to.

In the constructions shown in Figs. 1 to 4, *a a* are the shaped wires of copper, and *b b* the cylindrical wires of iron. In Figs. 1 and 2 these wires are laid up alternately around the core-wire *c*, and the whole is inclosed within the insulating-covering *d*, while in Figs. 3 and 4 several cylindrical iron wires *b b b b* are disposed between the shaped copper wires *a a*, laid up around the core-wire *c*, and then inclosed in a covering *d* of insulating material.

According to the construction illustrated in Figs. 5 and 6 shaped wires *a a* of copper and shaped wires *b b* of iron, arranged alternately, are laid up around a core-wire *c*, a smooth outer surface being hereby imparted to the conductor. The wires laid up around the core-wire may be wholly of iron, or there may be laid up around the core-wire first a number of wires of copper or other high-conducting metal or alloy and around these a number of wires of iron or other magnetic metal.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A flexible conductor for submarine cables wherein a number of iron and copper wires are arranged alternately, either singly or in groups, and laid up around a core-wire

of high conductivity, substantially as herein described.

2. An electric conductor for submarine cables having a central conducting-wire and, laid up around the same, a number of wires of iron or other magnetic metal arranged, either alternately or in groups, with a number of wires of copper or other metal of high conductivity, substantially as and for the purposes set forth.

THEODORE GUILLEAUME.

Witnesses:
WILLIAM H. MADDEN,
CHAS. E. BARNES.