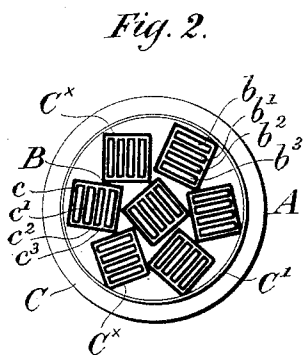
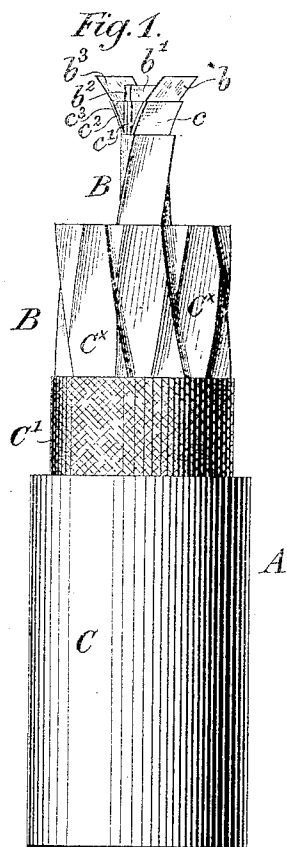


(No Model.)

T. GUILLEAUME.
ELECTRIC CABLE.

No. 531,614.

Patented Dec. 25, 1894.



WITNESSES:

WITNESSES:
Rich. Schuller
Ludw. Friesing

INVENTOR:

INVENTOR:
Thomas Guillemey

UNITED STATES PATENT OFFICE.

THEODORE GUILLEAUME, OF COLOGNE, GERMANY.

ELECTRIC CABLE.

SPECIFICATION forming part of Letters Patent No. 531,614, dated December 25, 1894.

Application filed April 26, 1892. Serial No. 430,791. (No model.) Patented in Germany November 7, 1891, No. 65,930, and in England November 12, 1891, No. 19,630.

To all whom it may concern:

Be it known that I, THEODORE GUILLEAUME, a subject of the German Emperor, residing at Cologne, in the German Empire, have invented certain new and useful Improvements in Electric Cables, (in respect whereof I have obtained Letters Patent in Germany, to bear date November 7, 1891, No. 65,930, and in Great Britain, to bear date November 12, 1891, No. 19,630,) of which the following is a specification.

This invention relates to electric cables, particularly such as are intended for use for telephonic transmission, and where complete metallic circuits are employed.

A telephone cable made according to this invention is illustrated in the accompanying drawings.

Figure 1 is a side elevation (having parts cut away to show the construction), and Fig. 2 a cross section.

The improved cable A comprises several strands B twisted together and sheathed with lead C or other suitable protective material. In the present design, the cable is composed of seven strands, each consisting by preference of four flat wires or metallic ribbons b , b' , b^2 and b^3 , each insulated from the others by means of a wrapping c , c' , c^2 or c^3 of paper or other suitable material. The four or other number of flat wires are arranged flatwise one upon the other, so as to form a bar or bundle approximately square in cross section, and the strand or bundle is then twisted. This latter treatment has the effect of fixing and permanently retaining the several conductors b , b' , b^2 and b^3 in position in relation to one another; but its primary object is to neutralize, and prevent the effect of, induction as between one conductor and another. The conductors b and b^3 , in conjunction with the transmitting and receiving instruments, form a closed circuit; the conductors b' and b^2 being similarly comprised in another closed circuit; or, the conductor b may be in communication with the conductor b^3 , and the conductor b' in communication with the conductor b^2 . In either case, two closed circuits are formed. Each strand or bundle is twisted and served, either before or after the twisting operation, with a coating C^x of paper or other

insulating material. Instead of each strand being composed of four conductors, any other even number may be employed.

A cable, instead of being composed of several strands B each constructed in the manner described, may consist of a single bundle of flat wires or ribbons b , b' , b^2 and b^3 , each insulated from the others, but laid flatwise together so as to present an approximately square cross section; the group or bundle being then twisted, served with a further coating of paper or other insulating material C^x , and finally sheathed with lead or other protective covering; or, several such twisted bundles, each inclosed in a lead covering, instead of or in addition to the paper coating C^x , may be twisted together to form a cable; the whole being ultimately furnished with an additional lead or other protective sheathing. The sheathing C may, if necessary, have an internal lining C' , and be protected externally by means of the usual kind.

A telephone cable constructed in the manner above described possesses the following advantages:—When, for instance, four of the flat wires or metallic ribbons are grouped together in a strand, the alternate or the extreme and mean conductors can be connected together to form two closed circuits; this arrangement destroying induction and securing improved efficiency, particularly in long distance telephony. The flat shape of the conductor is also advantageous for the utilization of capacity for the purpose of facilitating telephonic communication. The flat shape of the conductor does not, however, interfere with the employment of insulating material containing air-spaces when it is desired to reduce the capacity.

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

1. In an electric cable, a strand or bundle consisting of one or more pairs of flat wires or ribbons, each insulated from the other or others and each pair serving to convey flow and return currents in a closed circuit, the several wires or ribbons being laid flatwise against one another and the whole group being then twisted together, substantially as herein described.

2. In an electric cable, a strand or bundle

consisting of one or more pairs of flat wires
or ribbons, such as *b*, each served with insu-
lating material, such as *c*, and laid together
flatwise, the whole strand or bundle being
5 subsequently twisted, and, either before or
after the twisting operation, provided with
an insulating covering *C*^x, substantially as
herein described.

3. An electric cable consisting of a pair or
10 pairs of insulated ribbons, such as *b*, twisted

together to form a strand or strands, such as
B, the strand or strands being then insulated
and laid up into a cable and inclosed in a
sheathing, such as C, substantially as herein
described.

THEODORE GUILLEAUME.

Witnesses:

SIBILLA LANG,

H. ALLEN MAXWELL.