(No Model.)

W. T. HENLEY, Dec'd.

G. HENLEY & S. GEDGE, executors of said Henley, deceased.

TELEGRAPH CABLE.

No. 286,698. Patented Oct. 16, 1883.

FIG. 1.

FIG. 2.

FIG. 3

FIG. 4

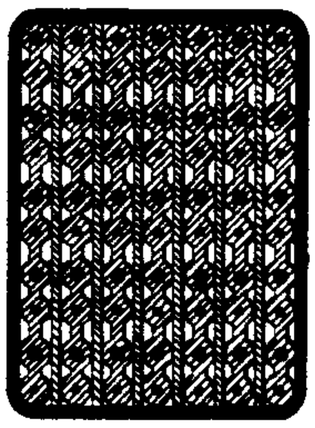

FIG. 5.

FIG. 6.

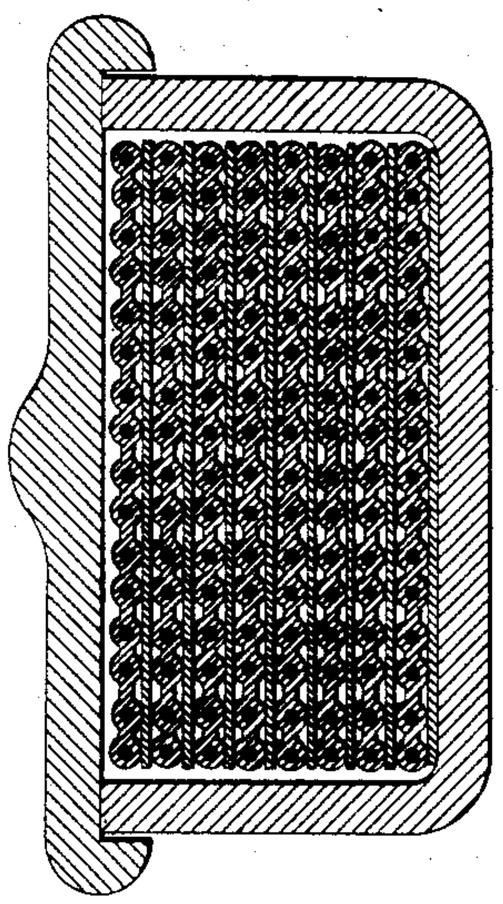

FIG. 7.

FIG. 8.

FIG. 9.

FIG. 10.

FIG. 11.

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM T. HENLEY, OF PLAISTOW, COUNTY OF ESSEX, ENGLAND; GEORGE HENLEY AND SYDNEY GEDGE, EXECUTORS OF SAID HENLEY, DECEASED.

TELEGRAPH-CABLE.

SPECIFICATION forming part of Letters Patent No. 286,698, dated October 16, 1883.

Application filed September 27, 1881. (No model.) Patented in England April 30, 1881, No. 1,873; in France May 30, 1881, and in Belgium May 30, 1881.

To all whom it may concern:

Be it known that I, WILLIAM THOMAS HENLEY, of Plaistow, in the county of Essex, England, telegraph engineer, have invented new and useful Improvements in Electric Cables for Telephone and other Purposes, (for which I have obtained a patent in Great Britain, No. 1,873, bearing date the 30th day of April, 1881,) of which the following is a specification.

According to the invention I construct combined conductors for telephonic, telegraphic, and other purposes, as hereinafter described, by which means I obtain additional strength and security, and obviate the disturbing effects produced by induction from wire to wire. I make the insulated wires with any suitable material, but prefer the ozocerited india-rubber, as described in the specification of my former patent dated April 5, 1881, No. 239,776. I inclose the wires by means of rollers or dies in the insulating material in pairs or any further number, as shown by the accompanying drawings. Figure 1 shows a single pair; Fig. 2, three pairs united, the spaces between each pair being greater than between the wires of each pair. This is to prevent the induction when using the metallic circuit for telephone purposes, as that is found to be much better than using the earth for the return-circuit. The metallic circuit is found to reduce the effects of induction considerably; but by my present improvements it will be diminished very much more, and the distances capable of being worked very much increased, also the tensile strength of the ropes, bands, and cables much increased. To obtain the latter effect I make one wire of each pair of steel, by preference galvanized or zinc-coated. This should be as much larger than the copper wire in same circuit as its electrical resistance is greater, so that the electrical conductivity of the pair of wires, steel and copper, should be as nearly as possible equal.

Fig. 1 shows a pair of wires thus constructed, and Fig. 3 a band of wires similarly made, with wider intervals between each pair; and Fig. 4 shows several such bands superposed, with tarred felt or other suitable material between each layer to keep the wires a suitable distance apart to counteract the inductive effects. These may be deposited in an iron or wood trough, or may be made up into a combined belt to be suspended from point to point or laid along the roofs of houses. When laid under ground in pipes or troughs, the wires may be all copper, as shown in Figs. 5 and 6, as so much tensile strength is not required. Fig. 7 shows some of the twin circuits for the telephone laid up spirally round a central steel strand covered with yarn, and each pair is kept farther apart by an intervening tarred cord. Fig. 8 shows the same with a second row or layer of the wires kept a certain distance from the other by tarred hemp or other suitable material. The whole is then covered with "compounded" tape or braided hemp. This furnishes a very strong rope, either for suspension or putting into pipes. These insulated wires may be single instead of being made in pairs; but for telephonic purposes each two wires should be separated by a space from the next two wires, as here shown. Fig. 9 shows the wires of copper and steel insulated round a central core of hemp or other suitable material. In this case the insulated steel wires, while forming part of the circuit, give the necessary tensile strength without the central steel strand. Fig. 10 shows a double row according to same plan. Fig. 11 shows insulated wires laid up round a central cord of suitable material, with insulated steel wires laid up spirally, also with tarred cords of hemp or other suitable material to keep the steel wires from injuring the cores. These cores and steel wires may be laid up in a double row, as shown. The steel wires will be found to give great strength to the rope for the purposes of suspension or otherwise, and may be used for the return-circuit, especially for telegraph purposes.

I claim as my invention—

1. An electric cable made as a belt, with two parallel metallic conductors inclosed in and insulated by a web of ozocerited india-rubber, having a groove on each side between the conductors, substantially as and for the purposes set forth.

2. An electric cable made as a belt, with pairs of parallel metallic conductors inclosed in and insulated by a web of ozocerited india-rubber having grooves on each side between

the conductors, the distance between two pairs of such conductors being greater than the distance between the conductors of each pair, substantially as and for the purposes specified.

3. An electric cable made as a belt, with two parallel conductors, one of copper and the other of steel having sectional areas in the inverse proportion of their electrical conductivity, the said conductors being inclosed in and insulated by a web of ozocerited india-rubber, having a groove on each side between the conductors, substantially as and for the purposes set forth.

4. An electric cable made as a belt, with pairs of parallel conductors, one conductor in each pair being of copper and the other of steel, with sectional areas in the inverse proportion of their electrical conductivity, and the said conductors being inclosed in and insulated by a web of ozocerited india-rubber, having grooves on each side between the conductors, the distance between two pairs of such conductors being greater than the distance between the conductors of each pair, substantially as and for the purposes specified.

London, 8th September, 1881.

W. T. HENLEY.

Witnesses:

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