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I. KITSEE.

TRANSMISSION OF INTELLIGENCE WITH THE AID OF ELECTRIC ENERGY.

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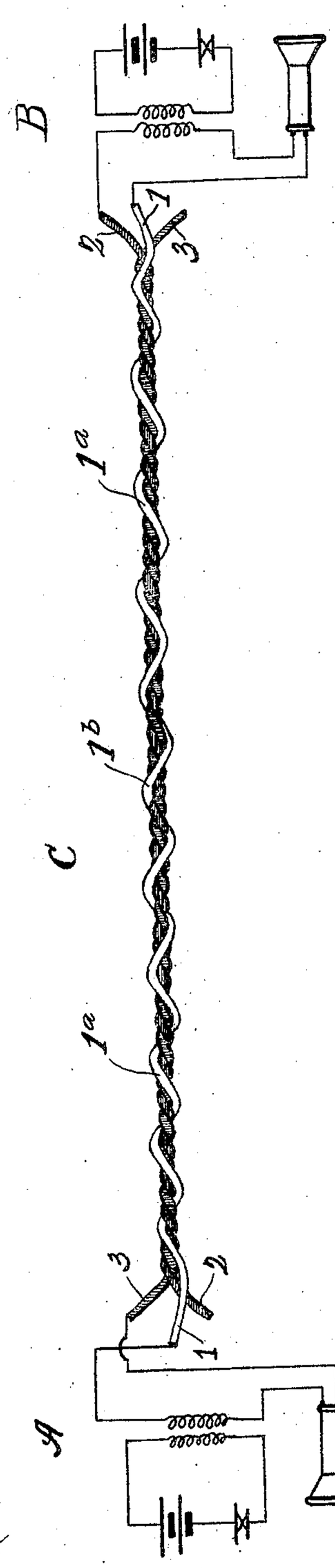

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TRANSMISSION OF INTELLIGENCE WITH THE AID OF ELECTRIC ENERGY.

No. 803,111. Specification of Letters Patent. Patented Oct. 31, 1905.

Application filed March 25, 1905. Serial No. 252,014.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in the Transmission of Intelligence with the Aid of Electric Energy, of which the following is a specification.

My invention relates to an improvement in the transmission of intelligence with the aid of electric energy, and has more special reference to long-distance telephonic transmission.

In general, my invention comprises the construction and use of such a line that the effects of induction are utilized to increase the quantity and quality of transmission, and which, it is probable, are combined to some extent with the effects of static capacity in bringing about the remarkable results attained. The construction referred to involves a line or cable which comprises a plurality of relatively insulated or conductively-separated wires, which are twisted in intimate relation with one another, and are therefore at no point in metallic contact. The wires for one line or a single circuit are preferably three in number and of a comparatively small gage. I have found that three strands of No. 28 insulated wire have given extremely satisfactory results in actual open-air tests for distance over a mile. These strands are twisted into intimate relation with each other so as to make approximately four or five complete turns to the inch for each strand. These twisted wires should preferably extend for the whole length of the line, the ends of two separate wires being connected to the instruments or apparatus at each end of the line or at any two stations, the opposite ends of two wires being left free.

I do not herein desire to advance any particular theory as to the causes and actions of the transmitting currents or impulses in my line which produce the great advantages in quantity, quality, and efficiency of the electric transmission. Suffice it to say that electric induction, both self and mutual, plays an important part in the transmission and is probably modified by and coöperates with static capacity to a greater or less extent.

I do not wish to be understood as being limited to the details, arrangements, and sizes herein set forth, for they may be varied to suit the different conditions of any particular line or number of lines included in a single circuit or cable, neither do I wish to be understood as being limited to the transmission of intelligence in the application of my invention, for it is evident that the same may be utilized in the transmission of power electrically by alternating or intermittent currents; but in practice I found that if the line is of an exceptionally long distance it is best that one of the three wires, and preferably the wire which is connected at each of the extreme stations with the usual telephonic devices, should be twisted in a manner so that part of its length should follow the twist of the other two wires and part of its length its twist shall be in a direction opposite to the direction of the twist of the other two wires. In my experiments I reversed the twist of this third wire every eleven hundred feet and found that the same gave satisfactory results; but it is obvious, if occasion requires, that the reverse of the twist may occur more or less frequent.

In the drawing, which illustrates in diagrammatic view my invention, C is the line of transmission as an entirety, consisting of the individual wires 1, 2, and 3. The wires 2 and 3 are twisted regularly with each other and the wire 1 follows the twist of these two wires 2 and 3 part of their length and then the wire 1 is reversed—that is, is twisted oppositely to the wires 2 and 3 for part of its length—this manner of twisting being followed out throughout the whole length of the line. I have designated the sections in which the third wire follows the twist of the other two wires as 1^a and the sections in which the third wire is twisted in opposition to the other two wires as 1^b.

The two stations at the extreme ends of the line I designate as A and B, respectively. At the station A the wires 1 and 3 are shown connected together, with the interposition of the receiving device and the secondary of an inductorium, and at the station B the wires 1 and 2 are shown connected together, with the interposition of the receiving device and the secondary. It is therefore seen that the three wires are connected together in a manner so that they form an open circuit, starting, let us say, at the free end of wire 3, running the whole length from station B to station A, connected there, through the usual receiving device and secondary, to the wire 1, which wire 1 then runs to station B, where it is connected, with the interposition of the usual device, to wire 2, this wire running back to station A and remaining there unconnected.

As stated above, all three wires are in intimate relation and twisted together, the twisting, as said above, of the two wires 2 and 3 being regular throughout and the twisting of the third wire (here shown as wire 1) being reversed at intervals.

It is necessary for me to add that the closer and shorter the turns of the twisted wires the better the transmission.

I do not deem it necessary to go into the detail of the construction of the transmitting and receiving devices used in the telephonic stations, as the same do not form part of my invention, and I have only illustrated these devices in conventional signs to show their connection to each other and to the line of transmission.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a circuit for transmitting varying electric currents a line comprising three insulated conductors twisted together in intimate relation with each other, said wires being inductively separated throughout their entire length and being connected together at their terminals in a manner so as to form one open circuit, the twist of two of said wires throughout the whole length of the line in one direction, and the twist of the third of said wires at intervals in opposition to the twist of the other two wires.

2. In a circuit for transmitting varying electric currents a line comprising three insulated conductors twisted in intimate relation with each other, two conductors having each one end connected to a separate station and the third connected with one end to one of said stations, and with the second end to the second of said stations more or less remote from the first-mentioned station, the direction of the twist of two of said conductors alike throughout the whole length and the direction of the twist of the third of said conductors running alternately with the twist of the other two conductors and opposite to the twist of the said two conductors.

3. A line for electrically transmitting intelligence consisting of three conductors insulated from each other but inductively related to each other, said three conductors connected together in a manner so as to form one continuous circuit and devices operatively connected to said circuit, the inductive relation of one of said conductors as to the other two conductors being alternately reversed.

4. In electric transmission a line comprising three conductors connecting two stations more or less remote from each other, said three conductors forming one open circuit, the inductive relation of one of said conductors as to the other of said conductors being reversed at predetermined intervals.

In testimony whereof I hereby sign my name, in the presence of two subscribing witnesses, this 23d day of March, A. D. 1905.

ISIDOR KITSEE.

Witnesses:
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