I. KITSEE.

ELECTRIC TRANSMISSION OF INTELLIGENCE.

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1,096,175. Patented May 12, 1914.

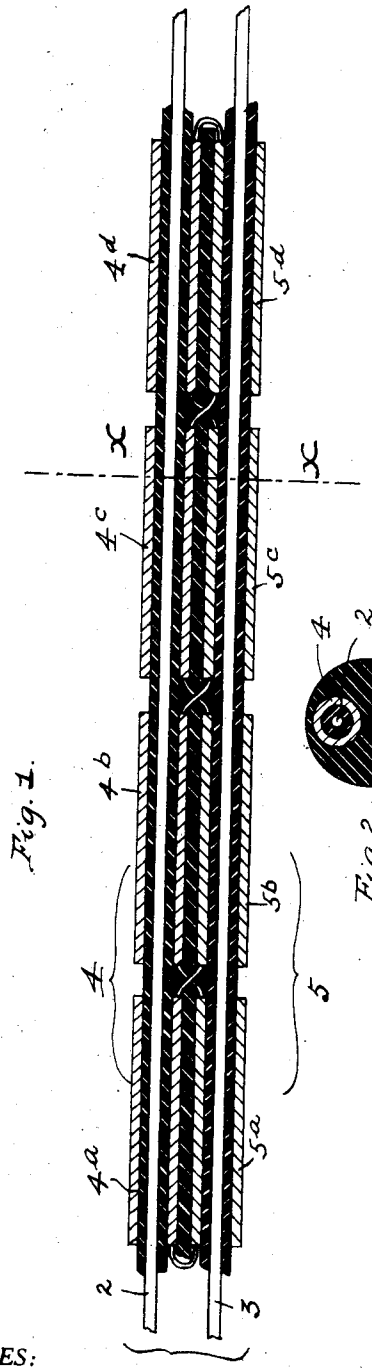


Fig. 1.



Fig. 2.

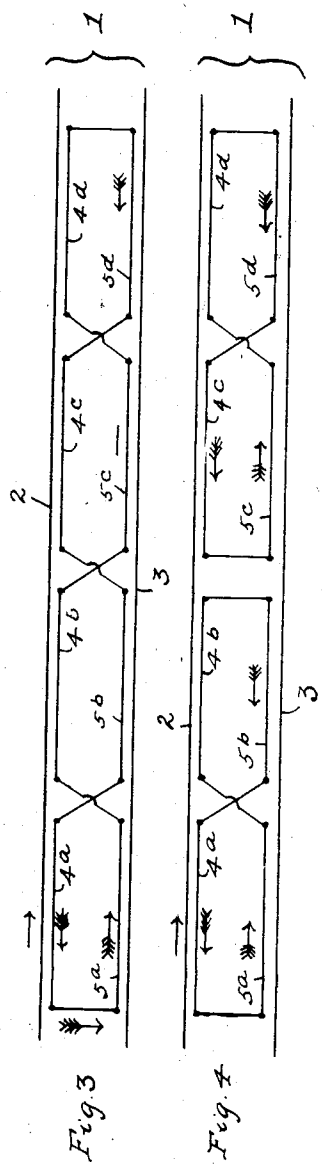


Fig. 3

Fig. 4

WITNESSES:

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ELECTRIC TRANSMISSION OF INTELLIGENCE.

1,096,175. Specification of Letters Patent. Patented May 12, 1914.

Application filed October 2, 1908, Serial No. 455,800. Renewed January 13, 1914. Serial No. 811,899.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric Transmission of Intelligence, of which the following is a specification.

My invention relates to an improvement in the electric transmission of intelligence and has more special reference to transmission over long distance lines, such for instance as submarine cables.

To-day, in a submarine cable, only one working line can be employed, for the reason that if two working lines, are placed parallel to each other, the disturbance through induction from one conductor to the other conductor would make the working on any of these conductors impractical. The delicate instruments employed in submarine cables would easily be affected by the impulses induced from one conductor into the neighboring conductor.

It is the aim of my invention to provide conductors inclosed in a cable with means to shield them from the inductive influence of neighboring conductors and thereby make it possible to produce a submarine cable with two or more working lines, each adapted to be worked independently from the other.

In the accompanying drawing, Figure 1 is a longitudinal section of a cable comprising two working lines provided with my invention. Fig. 2 is a section of Fig. 1 on the line x—x. Fig. 3 is a diagrammatic view showing the electrical connections. Fig. 4 is a diagrammatic view illustrating the connections in modified form.

In the drawing, 1 is the cable as an entirety; 2 and 3 are two working lines. The line 2 is provided with the conducting shield 4 and the line 3 is provided with the conducting shield 5. This conducting shield may be in the form of a braiding or tube, or may consist of any preferred construction, the only requirement being that the line proper should be, as much as possible, surrounded in its entirety by this shield.

The shield of line 2 is here shown as to be divided into four sections and designated as 4^a, 4^b, 4^c, and 4^d. The shield of line 3 is also divided into four sections and designated as 5^a, 5^b, 5^c, and 5^d. The different sections of the shield 4 are conductively connected with the different sections of the shield 5, so as to form a conducting circuit in a manner so that alternate sections of one shield connect with alternate sections of the second shield; the terminal sections being connected in series. The circuit, therefore, starting from the section 4^a of the shield 4 is arranged as follows: 4^a, one terminal of 5^b, the other terminal of 5^b connected to 4^c, the second terminal of 4^c connected to 5^d; the free terminal of 5^d connected to one terminal of 4^d; the free terminal of 4^d connected to one terminal of 5^c; the opposite terminal of 5^c connected to one terminal of 4^b; the second terminal of 4^b connected to one terminal of 5^a; the end terminals of 4^a and 5^a connected in series. It will thus be seen that the different sections of the two shields are, electrically considered, transposed as to their working lines. It is now supposed that an impulse is transmitted over the line 2 in the direction of the unfeathered arrow and this impulse will induce in the section 4^a an impulse flowing in the direction of the feathered arrow. This impulse has to flow through the alternate sections of the two shields in a manner, so as to be neutralized in the different sections of the shield 5. The inductive influence, therefore, of the impulse in shield 4 will be nullified or neutralized on the shield 5, and vice versa; an impulse generated in the shield 5 will be, on account of the transposition, neutralized or nullified on the shield 4. The inducing effect, therefore, of the line 2 on the line 3 will be *nil*, and vice versa; the inducing effect of the line 3 on the line 2 will be *nil*. If it is desired to assemble more than one pair of working lines into one cable, then the shield sections of the different pairs may be connected in multiple, or the transposition of the different shield sections for the different working lines may be transposed substantially as is shown in the drawing; that is, they may be connected in series as to each other in a manner, so that the flow of an induced impulse from one section may be nullified by the flow of an induced impulse from the adjoining section.

In the drawing, each line wire is insulated from the shield and the shield of each working line is insulated from the shield of the other line through the entire length with the exception of those parts which are con-

nected conductively together so as to form one circuit. I have shown in this drawing the braiding as to consist of four separate conductors, but it is obvious that the number of these conductors may be increased or decreased at will without departing from the scope of my invention, and in this case, the separate conductors may be connected so as to form more than two circuits and may also be connected so as to form only one circuit.

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

1. In a system for electrically transmitting messages, a cable comprising a plurality of conductors in independent working circuits, a shield conductor in said cable for each of said conductors, and means for connecting said shield conductors of said different conductors in an independent closed circuit.

2. In a system for electrically transmitting messages, a cable comprising a plurality of conductors in independent working circuits, a shield conductor in said cable for each of said conductors, said shield conductors of said different cable conductors included in an independent closed circuit transposed at intervals along said cable.

In testimony whereof I affix my signature in presence of two witnesses.

ISIDOR KITSEE.

Witnesses:
EDITH R. STILLEY,
MARY C. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."