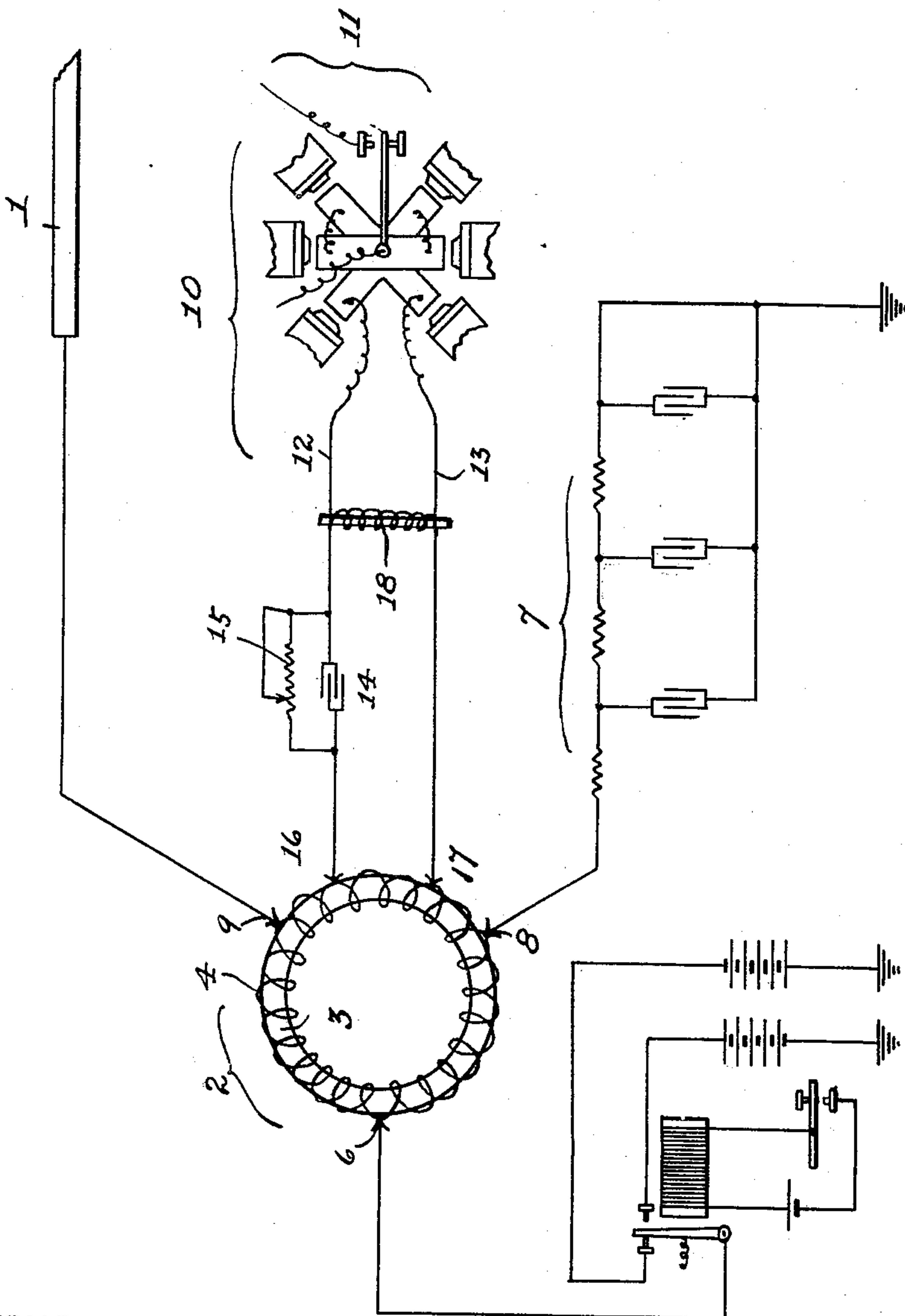


I. KITSEE.
 DUPLEXING TELEGRAPHIC LINES.

APPLICATION FILED APR. 12, 1911. RENEWED DEC. 30, 1916.

1,218,870.

Patented Mar. 13, 1917.



WITNESSES:

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DUPLEXING TELEGRAPHIC LINES.

1,218,870.

Specification of Letters Patent.

Patented Mar. 13, 1917.

Application filed April 12, 1911, Serial No. 620,649. Renewed December 30, 1916. Serial No. 139,962.

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 Duplexing Telegraphic Lines, of which the following is a specification.

My invention relates to an improvement in duplexing telegraphic lines. Its object is to produce efficient means to duplex telegraph lines.

For the purpose of illustrating one form my invention may take, reference is had to the accompanying drawing.

In this drawing I have illustrated one terminal of a cable provided with a duplexing arrangement according to my invention and I have also illustrated in this drawing means to transmit impulses. It is obvious that these means may vary according to requirements.

1 is the line of transmission here shown as part of a cable; 2 is the duplexing device as an entirety. This duplexing device performs the function of what is known in the art as an "auto-transformer", i. e., part of the closed electric circuit is connected to the current carrying wire and part of same is connected to a circuit from which the resultant impulses may be taken. This duplexing device comprises here the closed magnetic circuit 3 and the closed electric circuit 4. The closed electric circuit consists here of a wire wound spirally around the magnetic core and closed at its terminals.

5 is the transmitting arrangement as an entirety. This transmitting arrangement is connected through a switch or similar device 6 with the coil 4 of the device 2 in a manner so that this connection may be varied at will. 7 is the artificial line connected through means 8 with a second part of the coil 4. This connection is also made so as to be varied in accordance with the desire of the operator. The line of transmission or cable 1 is connected through means 9 with the third part of the coil 4 and this connection may also be varied in accordance with requirements.

10 is the receiving arrangement as an entirety. This receiving arrangement comprises here the relay or receiving device 11 connected to the circuit comprising the wires

12 and 13. 14 is a condenser shunted by the variable resistance 15 and inserted in the wire 12. The terminal of the wire 12 is connected through means 16 to one part of coil 4 and the terminal of the wire 13 is connected through means 17 with a second part of the coil 4. Both of these means are such that their relation to the coil may be varied in accordance with requirements.

18 is an inductive resistance in shunt to the wires 12 and 13.

The function of an auto-transformer is well understood and does not need to be here referred to in particular. It suffices to say that when the home impulses are transmitted over the line through the device 2, no current will flow through the circuit 12 or 13. But when an impulse arrives from the far off station, its effect will be felt in the circuit 12 and 13 and, therefore, the relay or receiving device 11.

It is obvious that those parts of the coil 4 to which the receiving circuit is connected, may be made of wire of finer gage than the other parts; and it is also obvious that the parts to which the receiving device is connected may consist of a greater number of convolutions than the remaining parts.

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

1. As a means to duplex lines of transmission, an auto-transformer, part of said transformer connected to the transmitting circuit and part of said transformer connected to the receiving circuit comprising an impedance and a receiving device connected to said impedance.

2. As a means to duplex lines of transmission, a closed electromagnetic coil, means to connect part of said coil to the transmitting circuit, part of said coil to the line of transmission and part of said coil to the receiving circuit, said receiving circuit comprising a condenser, a resistance overbridging said condenser, and an impedance, and comprising also a polarized relay in shunt with said impedance.

3. In cable telegraphy, in combination with a line of transmission, an artificial line, a receiving device and a transmitting device, a duplexing device comprising an autotransformer in the form of a closed magnetic impedance, a connection between said imped-

- ance and one terminal of said transmitting device, a connection between said impedance and one terminal of said line of transmission, a connection between said impedance and one terminal of the artificial line and two connections between said impedance and the circuit including the receiving device; each of said connections comprising only part of said closed impedance.
4. In cable telegraphy, the combination with a line of transmission, an artificial line, a receiving device and a transmitting device, of a duplexing device comprising an autotransformer in the form of a closed impedance, a connection between said impedance and one terminal of said transmitting device, a connection between said impedance and one terminal of said line of transmission, a connection between said impedance and one terminal of the artificial line, and two connections between said impedance and the circuit including the receiving device, said several connections being variable to include more or less of said closed impedance.
- In testimony whereof I affix my signature in presence of two witnesses.
- ISIDOR KITSEE.
- Witnesses:
EDITH R. STILLEY,
MARY R. SMITH.

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