Aug. 28, 1934. R. HERZOG 1,971,911

ELECTRIC RECEIVER FOR SIGNALING ARRANGEMENTS

Filed April 27, 1932

Fig. 1

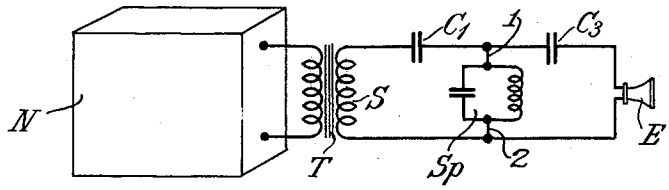
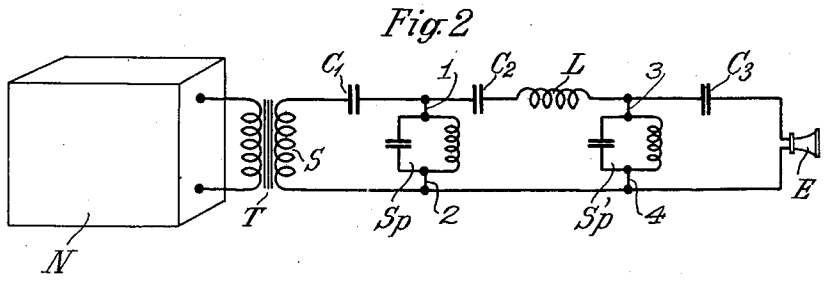


Fig. 2



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ELECTRIC RECEIVER FOR SIGNALING ARRANGEMENTS

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5 Claims. (Cl. 178—51)

In the art of electric signaling, the problem arises as to how to separate from one another different telegraphic transmitters working on the same or approximately the same frequency. Moreover, it may happen that a telegraphic transmitter is situated very close to a working telephonic transmitter and therefore its reception is likewise rendered difficult. The problem is most difficult, however, if telegraphic transmitters to be separated work on the same frequency and are distinguished from one another merely by their low frequency tone. Attempts have been made to solve this problem by means of a loose-coupled rejector circuit arrangement, but this is not sufficient as soon as the tones of the transmitters differ only very slightly.

The difficulty is overcome, in accordance with the present invention, by inserting in the low frequency circuit of the receiver a filter arrangement which comprises in its simplest form two series connected acceptor circuits tuned to the tone to be received, one comprising the input circuit and the other the output circuit, and a rejector circuit likewise tuned to this tone and connected across the terminals of the acceptor circuits. If desired, further units, each comprising an acceptor and a rejector, can be connected in circuit in the filter arrangement between the input and output, as will be more fully described hereinafter. In such arrangements, according to the invention the amount of capacity employed in each rejector should be large compared with that of an acceptor and preferably at least ten times as great.

The invention will now be more fully described with reference to two specific embodiments thereof illustrated in the accompanying drawing in which

Fig. 1 is a diagrammatic representation of one embodiment, Fig. 2 a similar view showing the other embodiment.

Like characters of reference denote like parts in both views.

In either view the wiring diagram shows the output circuit of the low frequency part N of a receiver. In this circuit is connected a transformer T, the secondary winding S of which, together with the condenser C1, forms an acceptor circuit for the tone frequency to be received and the input of the filter arrangement according to the invention. The output acceptor circuit is formed by a capacity C3 and the inductance of the telephone E, which are likewise tuned to the tone to be received.

The embodiment shown in Fig. 1 consists of these two acceptor circuits S, C1 and C3, E and a rejector circuit Sp connected to the terminals 1, 2.

In the embodiment illustrated in Fig. 2, a further acceptor, consisting of a capacity C2 and an inductance L, is interposed between the input acceptor S, C1 and the output acceptor C3, E. A rejector circuit Sp' is connected to the terminals 3, 4 which are disposed between the acceptors C2, L and C3, E.

The capacity in each rejector Sp or Sp' is chosen as large as possible and the inductance as small as possible, with the total damping of the circuit as small as possible in other respects. The problem of separating telegraphic transmitters from one another is then solved if the condensers of the rejectors have capacities which are large compared with those of the condensers C1, C2 or C3 of the acceptors, preferably at least ten times as great. This invention therefore exhibits a characteristic distinction from the prior art, in that the rejector circuits employed embody capacities far larger than customary hitherto in the art.

It is obvious that the arrangements illustrated can be repeated in any number of successive stages, according to circumstances. Moreover, either part of the filter may be selectively cut out. The advantage of a circuit operating as described with acceptor circuits and rejector circuits connected across their terminals resides in the fact that losses are extremely small. At the points 1, 2 and 3, 4, there obtains only a voltage which corresponds to the ohmic voltage drop in the acceptor circuit and therefore is extremely low. Only a very small loss can thus result.

What is claimed is:

1. In an electric receiver for telegraph signaling arrangements, a low frequency circuit including an input acceptor circuit, an output acceptor circuit connected in series therewith to form a filter arrangement, each acceptor circuit being tuned to the frequency of the signal to be received, and a rejector circuit bridging these acceptor circuits and likewise tuned to said signal frequency, the capacity of such rejector circuit being at least ten times that of either of said acceptor circuits, the damping of the rejector circuit being low, whereby said rejector circuit forms a high impedance path to the frequency of the signal to be received and a low impedance path to frequencies adjacent said signal frequency.

2. In an electric receiver for telegraph signaling arrangements, a low frequency circuit including an input acceptor circuit, an output acceptor circuit connected in series therewith to form a filter

arrangement, each acceptor circuit being tuned to the frequency of the signal to be received, and a rejector circuit bridging these acceptor circuits and likewise tuned to said signal frequency, the capacity of such rejector circuit being ten times as great as the capacity of either of said acceptor circuits, the inductance and the damping of the rejector circuit being low, whereby said rejector circuit is sharply tuned to the signal frequency and forms a high impedance path thereto and a low impedance shunt to frequencies adjacent said signal frequency.

3. In an electric receiver for telegraph signaling arrangements, a low frequency circuit including series connected acceptor circuits each tuned to the frequency of the signal to be received, one thereof forming the input circuit and another thereof the output circuit of a filter arrangement, and rejector circuits bridging these acceptor circuits and likewise tuned to said signal frequency, the capacity of such rejector circuits being at least ten times that of each acceptor circuit, the damping of the rejector circuit being low whereby it forms a high impedance path to the frequency of the signal to be received and a low impedance to frequencies adjacent thereto.

4. In an electric receiver for telegraph signaling arrangements, a low frequency circuit including series connected acceptor circuits each tuned to the frequency of the signal to be received, one thereof forming the input circuit and another thereof the output circuit of a filter arrangement, and rejector circuits bridging said acceptor circuits and likewise tuned to said signal frequency, the capacity of each rejector circuit being ten times as great as the capacity of each acceptor circuit, the inductance and resistance of the rejector circuit being low, whereby said rejector circuit is sharply tuned to the signal frequency offering a high impedance thereto and forms a low impedance shunt to frequencies adjacent said signal frequency.

5. In a telegraph receiver having an audible signal member, a low frequency circuit including an input acceptor circuit consisting of an inductance and a capacitance element, an output acceptor circuit consisting of a capacitance element and an inductance element connected in series with said input acceptor circuit, said inductance element being a part of said audible signal member, a rejector circuit bridging said acceptor circuit, said circuits having values of capacitance and inductance and connected at points in such spaced relation to each other that impulses of desired frequencies are transmitted to said audible signal receiving member and impulses of other frequencies are by-passed by said rejector circuit, the capacitance of the rejector circuit being high relative to the inductance and resistance thereof and at least ten times that of each acceptor circuit, whereby said rejector circuit is sharply tuned to the frequency of the signal to be received and offers low impedance to adjacent frequencies either side of the signal frequency.

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