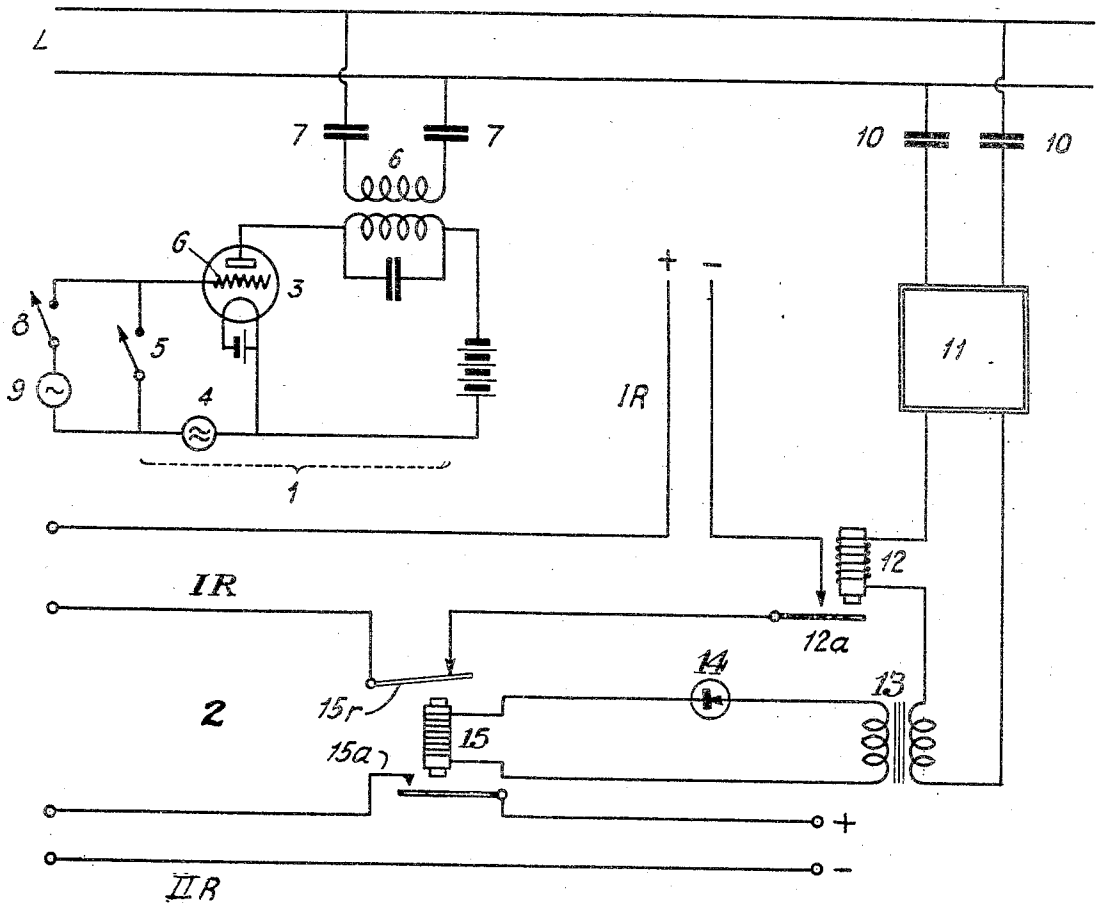
Feb. 14, 1933. W. STÄBLEIN 1,897,739

CONTROL MEANS

Filed Jan. 6, 1932



INVENTOR
WILHELM STABLEIN
BY H. S. Glover
ATTORNEY

Patented Feb. 14, 1933 1,897,739

UNITED STATES PATENT OFFICE

WILHELM STÄBLEIN, OF BERLIN, GERMANY, ASSIGNOR TO ALLGEMEINE ELEKTRICITÄTS GESELLSCHAFT, FRIEDRICH KARL, OF BERLIN, GERMANY, A CORPORATION OF GERMANY

CONTROL MEANS

Application filed January 6, 1932. Serial No. 584,921, and in Germany October 2, 1930.

This invention relates to control means, and in particular to means for the selective transmission of two signals by modulation of one carrier wave.

For the purpose of selective transmission of two signals, as is known in the prior art, two distinct radio frequencies may be used which are coordinated, respectively, to the two signals. However, it is also known in the earlier art that the two desired signals may be transmitted on a single frequency, each of the signals having its own modulation frequency, differentiation being insured by different modulation of one and the same carrier wave.

Now, according to the present invention a simpler arrangement is created by that only one of the two signals to be distinguished is differentiated or characterized by modulation, while the other signal is transmitted unmodulated. On the one hand, this means a simplification in the transmitter equipment insofar as another modulator device is dispensable, while, on the other hand, such electrical filter means as have heretofore been provided at the receiving end for the purpose of separating the various frequencies or modulation frequencies can be dispensed with, for separation is accomplishable by the aid of a simple relay scheme.

There is shown in the accompanying drawing, by way of example, an arrangement adapted to wired wave transmission.

The sending end is denoted by 1, and the receiving end by 2. At the transmitter end is provided a generator or oscillator valve, or relay of that type wherein the input circuit is connected with a radio frequency source indicated at 4. This source is included in the grid circuit of the oscillator or relay tube 3. Whenever the unmodulated signal is to be sent out, the switch 5 is closed and as a result the radio frequency source 4 is connected with the grid G. By means of the coupler coils 6 and the coupling condensers 7, oscillations having the frequency of the source 4 are then fed from the anode cathode circuit of tube 3 into the wire line L. When the modulated signal is to be transmitted, the switch 8 is closed. The radio frequency source 4 and the modulation wave source 9 are now connected in series with the grid G. This results in the transfer of a radio frequency carrier wave modulated by the frequency of the generator 9 being transferred to the line L and over said line to the receiving station.

At the receiving end a radio frequency receiver 11, merely indicated schematically, is connected by way of the coupling condensers 10 to the line L. The said radio frequency receiver 11 has in series in the output thereof the direct current relay 12 and the primary winding of an alternating current transformer 13. The secondary winding of said transformer is connected in series with a rectifier 14 and direct current relay winding 15. Whenever unmodulated radio frequency current is transmitted, a pure direct current will flow in the audio frequency circuit of the receiver 11 with the result that only the relay 12 is caused to respond and is caused to close its working contact 12*a* in the circuit IR. When modulated radio frequency current is transmitted, then a direct current having an alternating current superposed thereon will flow in the audio frequency circuit of the receiver 11. The alternating current component induces in the secondary end of the transformer 13 a corresponding potential which is rectified by the rectifier 14 and which causes the relay 15 to respond. In this relay the working contact 15*a* included in the circuit IIR is closed, while the back contact 15*r* included in circuit I will be opened. Simultaneously with the energization of the relay 15, however, also the relay 12 becomes energized so that the working contact 12*a* will be closed also when the signal modulated with alternating current is transmitted. By the opening of the back contact 15*r* contained in the circuit IR, however, this circuit will be opened so that, as will be seen, when transmitting the unmodulated signal only the circuit IR, and when transmitting the modulated signal, only the circuit IIR, is closed.

The circuits IR and IIR may be connected to any apparatus for the utilization of unmodulated carrier frequency and modulated

carrier frequency respectively. For example, in a radio or wired radio signaling system, a printer may be rendered operative by circuit IR to receive and record the messages sent through circuit IIR.

Having thus described my invention and the operation thereof, what I claim is:

1. Signalling apparatus comprising a transmission channel, transmitting apparatus including a high frequency thermionic generator having its output electrodes connected with said channel, a source of high frequency connected with the input electrodes of said generator, a source of modulating frequency in series with said input circuit, switching means in said circuit, said switching means being adapted to short-circuit said modulating frequency source, a receiver at the other end of said channel, said receiver having an output circuit including an alternating current relay and the primary of an alternating current transformer in series, detecting means in series with the secondary winding of said alternating current transformer, a direct current relay connected with said detecting means, a plurality of work circuits, contact means in one of said work circuits associated with each of said relays, and contact means in another of said circuits associated with one of said relays.

2. An arrangement for the selective transmission over a line of two signals by means of a single carrier wave comprising, a source of high frequency oscillations, means for capacitively coupling said source to said line, a source of modulating energy connected with said high frequency source, switching means for short-circuiting said source of modulating energy whereby said carrier may be sent out over said line modulated or unmodulated, a receiver connected with said line, a pair of signalling circuits, a pair of relays connected between said receiver and said signalling circuits, one of said relays being responsive to energy in the output of said receiver to close one of said circuits when said carrier is unmodulated, both of said relays being responsive to energy in the output of said receiver to close both of said circuits when said carrier is modulated, and additional means for maintaining one of said circuits open when said carrier is modulated.

3. Signalling apparatus comprising, a transmission channel, transmitting apparatus including a source of high frequency oscillations connected with said channel, a source of modulating potentials connected with said source of high frequency oscillations, switching means, said switching means being adapted to short-circuit said modulating potential source, receiving means associated with the other end of said channel, said receiving means having an output circuit including a relay, detecting means coupled with said output circuit, a second relay coupled with said detecting means, a plurality of work circuits, circuit interrupting means in one of said work circuits associated with each of said relays, and circuit interrupting means in another of said circuits associated with one of said relays.

WILHELM STÄBLEIN.