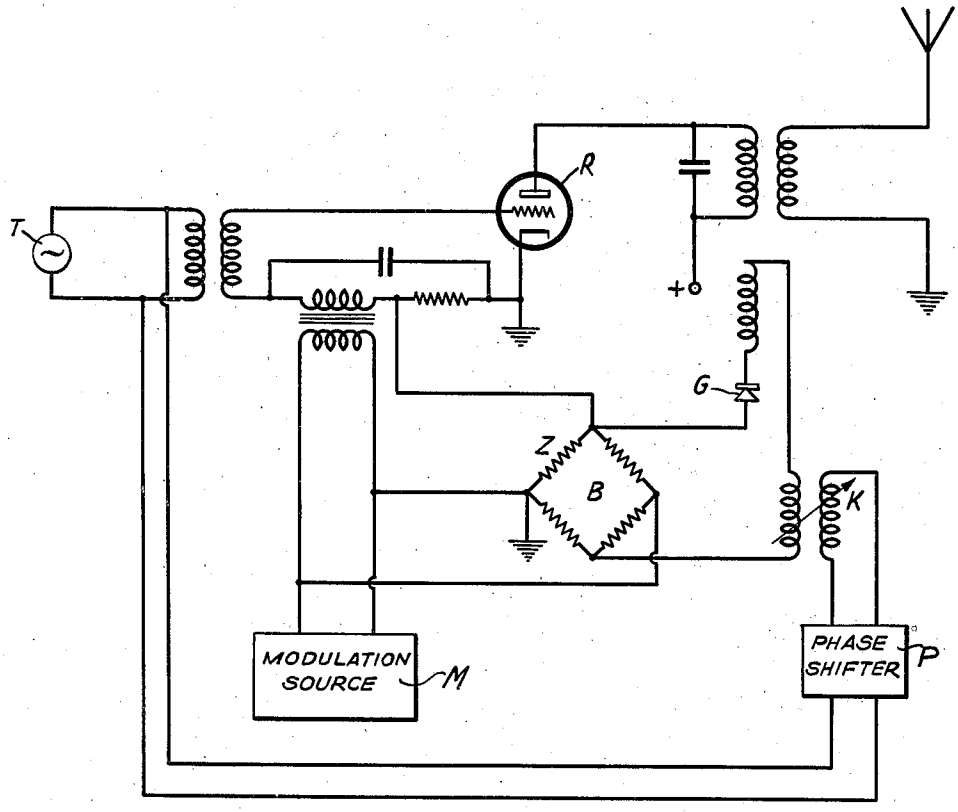
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HIGH FREQUENCY TRANSMITTER

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HIGH FREQUENCY TRANSMITTER

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4 Claims. (Cl. 179—171.5)

The invention relates to a high frequency transmitter in which reduction of distortion through counter coupling of the low frequency component is obtained by detection of the modulated oscillations appearing in the output. It is known to bring about a distortion reduction by counter coupling of the audio-frequency and a difference voltage formed by the audio frequency appearing in the output and by the original modulation potentials. The audio-frequency is obtained by the detection of the high frequency oscillations derived from the output circuit. It was found, that at very high degrees of modulation of the transmitter a satisfactory distortion reduction cannot be brought about and that additional distortions appear whose cause was at first not known. The invention is based upon the teaching that these distortions which are produced at high degrees of modulation can be traced to the fact that the detection in the detector rectifying the output potential is not linear so that in this detector additional distortions appear rendering impossible a complete compensation of the other distortions. These difficulties can be eliminated in accordance with the present invention in a simple manner in that the degree of modulation of the high frequency oscillations appearing in the output circuit and applied to the detector is decreased by the application of carrier oscillations so that the detector instead of having to detect fully modulated oscillations, need be used only for the detection of oscillations whose degree of modulation may be as low as desired. In this case a completely linear operation of the detector can be easily achieved, since its characteristic can always be maintained linear over a small range. In the case of highly modulated oscillations linear detection over the entire range may be accomplished only under great difficulties.

The invention will be elucidated with reference to the accompanying figure which shows an embodiment of the invention. Herein is shown item M the modulation source and item T, the source of the carrier frequency both operating upon the transmitter tube R contained in any desired modulation circuit. The high frequency oscillations are derived from the output circuit of the tube R and applied to a detector G. The detector is connected to the one diagonal of the bridge circuit B, to the other diagonal of which the original modulation potentials are applied. Then in the one branch of the bridge, for instance in Z, there appears the difference of the potential derived from the output and the original audio frequency potentials i. e. only the potentials which correspond to the distortions in the tube and its circuits. These potentials are applied to the grid circuit of the tube R where they effect a compensation of the distortions. Since the detector G does not operate strictly linearly for high modulation percentages, the invention proposes to couple in the detector circuit additional carrier frequency oscillations derived from the carrier frequency source T and applied to the detector circuit by means of the coupling coil K. Phase shifting means P is provided in the circuit. The phase relationship between the modulated and unmodulated currents is so adjusted that the resultant percentage modulation is within the range handled by the detector G with minimum distortion. Aside from the control setting of the phase relationship between the modulated current and the unmodulated current, in addition a control of the amplitude may be carried out in this circuit so that the degree of modulation of the modulated high frequency potentials appearing at the detector G can be chosen as desired.

The invention is not limited to the example of construction shown and may be used in the various circuits in which it is necessary to return and rectify the potentials derived from the output of a discharge tube circuit.

I claim:

1. The method which includes the steps of impressing modulating potentials on high frequency oscillations to obtain modulated high frequency oscillations, adding a portion of said high frequency oscillations to a portion of said modulated high frequency oscillations in a desired phase relationship whereby a modulated oscillation of a lower percentage of modulation is produced, rectifying said last mentioned modulated oscillations to produce additional alternating current components and superimposing said additional alternating current components on said modulating potentials in a desired phase relationship.

2. In combination, a source of carrier waves, a modulator tube, a source of modulating waves, means for feeding carrier and modulation waves from said sources to said modulator tube, a rectifier, means for feeding modulated wave energy from said modulator tube and means for feeding unmodulated carrier wave energy from said carrier wave source to said rectifier, and means for additionally modulating carrier wave energy from said carrier wave source with the output of said rectifier.

3. Signalling means comprising an electron tube having emitting, controlling and output electrodes, a source of modulating potentials, a source of carrier frequency oscillations, circuits coupling said sources to electrodes of said tube, an output circuit connected to electrodes of said tube, a rectifier, a circuit for feeding part of the modulated energy appearing in the output circuit of said tube to said rectifier, another circuit for feeding unmodulated carrier wave energy from said carrier frequency source to said rectifier, a circuit through which the output of said rectifier flows for additionally modulating carrier wave energy fed from said carrier frequency source to said tube.

4. In a signalling system an electron discharge tube having input and output circuits, a source of modulating potentials, means for subjecting input electrodes of said tube to said modulating wave potentials, means for additionally subjecting input electrodes of said tube to waves from a carrier frequency oscillation source, an output circuit connected to output electrodes of said tube, a rectifier coupled to said output circuit, a circuit for feeding unmodulated carrier frequency wave from said carrier source to said rectifier and means for subjecting the input electrodes of said tube with the rectified output of said rectifier.

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