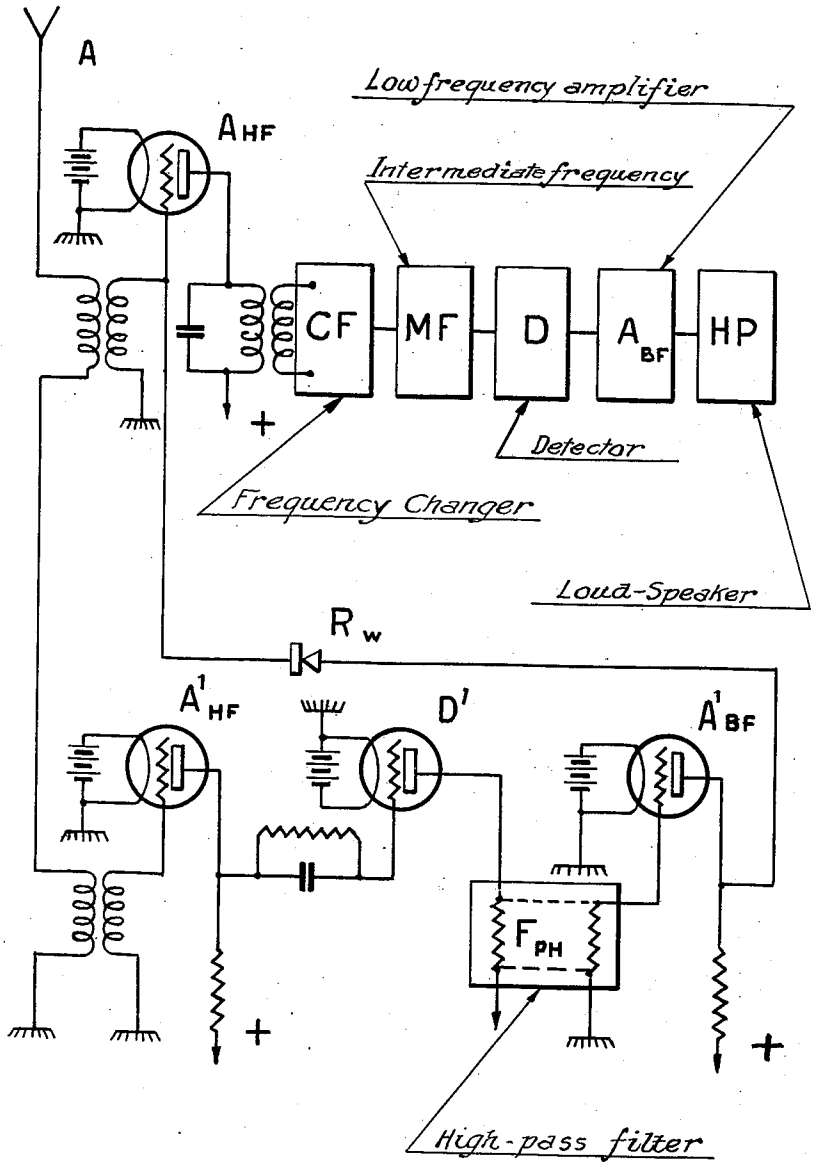
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ANTIPARASITE FILTER FOR RADIO RECEIVERS

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ANTIPARASITE FILTER FOR RADIO RECEIVERS

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5 Claims. (Cl. 250—20)

The present invention is for the elimination of parasites in wireless telegraphy and telephony and utilizes two fundamental properties of these perturbations:

(1) Their very high damping which is the cause of the well-known fact that every parasite represents a sequence of waves of a very brief total duration; and

(2) The very irregular, non-sinusoidal shape assumed by the curves of the low frequency currents produced by the parasites after detection.

These two properties, in a rather simple way separate the detected parasites from the detected emissions. In fact, if at the reception, the complex of incoming waves passes through strongly damped circuits, or is amplified aperiodically, the sequences of waves, constituting the parasites, conserve their very brief total durations and become, after detection, very brief impulsions, the duration of which is considerably inferior than that of the periods of the highest acoustic vibrations.

Let us now assume that we let pass the complex of low frequency currents, thus obtained, through a high-pass filter, the inferior frontier of which is situated above 6,000 cycles/second. Under those conditions, the emissions (i. e. music and speech) will not pass; only the impulsions produced by the detected parasites will pass.

If these impulsions, properly amplified, and directed, act thereafter on the grid of an amplifier submitted to the action of the same complex of incoming waves, this valve will be blocked every time when a parasite will appear in the incoming complex. This blocking will have exactly the same duration as the parasite. The amplification, thus controlled, lets the high frequency oscillations pass during the intervals of time situated between the perturbations. In such a way, the incoming complex is released from parasites. The very brief interruption of the emission produced by the blocking of the amplifier, disappears in the following stages of amplification on account of the very reduced damping of the oscillating circuits placed there.

The figure of the drawing attached thereto, represents exclusively as an example, one of the possible diagrams of the antiparasite device described above.

The upper row represents an ordinary radio-receiver formed by an aerial A, a high frequency amplifier (a semiaperiodical one) A_{HF}, a frequency changer CF, a stage of intermediate frequency MF, a detector D, a low frequency amplifier A_{BF} and a loud speaker HP. This type of receiver may be replaced by any other type of receiver, either a super heterodyne, or a direct receiver, or any other type whatsoever. Especial care however, should be taken to establish the first high frequency amplification in such a way that it should not transform the strongly damped, and consequently very brief, sequences of waves, constituting the parasites, into less damped sequences which, consequently would be of a relatively long duration.

The grid of this first high frequency amplifier (A_{HF}) is submitted to the action of the brief leaps of negative tension produced by the detection of parasites effected in the auxiliary device represented in the lower row of the figure. The auxiliary device is influenced by the same complex of incoming waves as the receiver drawn in the upper row, because both devices are connected to the same antenna A. The incoming complex passes first through the high frequency amplifier A'_{HF}, constituted so that the strongly damped sequences of waves conserve the strong damping and their very brief durations. For this purpose, either an aperiodic amplification (such as represented on the drawing), or sufficiently damped oscillating circuits, should be utilized. After amplification, the incoming complex is detected by the detector D', and the system of low frequency currents, thus obtained, is led through a high pass filter F_{PH}, the inferior frontier of which is situated above the musical frequencies, for instance, above 5,000 to 6,000 cycles/second.

Thus, the filter F_{PH} will stop all music and speech and will let pass only the very brief impulsions produced by the parasites after their detection. These impulsions will be amplified by the low frequency amplifier A'_{BF} and led to the grid A_{HF} in the proper manner, i. e., as negative impulsions, either directly or through a rectifier R_W, or through push-pull rectifiers, in order to eliminate the impulsions of opposite sign.

In this way, the valve A_{HF} will be blocked every time a parasite appears in the incoming complex, and this blocking has the same duration as that of the parasite in question. As to the interruptions produced by these blockings, they are inevitably swept off under the action of the various oscillating circuits contained in the receiver, in view of the weak damping of these circuits and the very reduced duration of the interruptions.

Having now particularly described and ascertained the nature of my said invention and in

what manner the same is to be performed, I declare that what I claim is:

1. In a wireless receiver a method for eliminating noise interference comprising first, detecting the whole plurality of incoming waves comprising both the signals to be received and the interference, second, filtering the detected plurality of waves to substantially absorb all waves other than the interference, third, amplifying the impulses from the detected interference, fourth, amplifying the entire plurality of incoming waves including the interference and permitting the detected interference to block the amplification of the interference coupled with the signals to be received.

2. In a wireless receiver, the method of eliminating noise interference which consists in, detecting the whole plurality of incoming waves comprising the signals to be received and the interference, in filtering the products of the detection to block out the signals and to transmit the interference, and in amplifying the whole plurality of incoming waves comprising the signals to be received and the interference and simultaneously the filtered-out detected interference to permit the detected interference to block and substantially to nullify amplification of the interference coupled with the signal to be received.

3. In a wireless receiver the method of eliminating noise interference which consists in detecting the whole plurality of incoming waves comprising the signals to be received and the impressed interference in high-pass filtering the detected waves and interference with a lower limit substantially close to the upper audio-limit to absorb the detected incoming signals while transmitting the higher frequency interference, and in amplifying the entire plurality of incoming waves comprising the signals to be received and the impressed interference and simultaneously the filtered detected interference to amplify only detected signals minus the disturbance by causing mutual blocking of the filtered and the impressed disturbances.

4. In a wireless receiver, at least one high frequency amplifying stage, a detector stage for detecting the entire plurality of incoming waves comprising the signals to be received and the interference, a filter for filtering out and transmitting the detected interference, means for impressing on the grid of the high frequency stage the entire plurality of incoming waves comprising the signals to be received and the interference, the output of said filter being connected to said grid to impress said detected filtered interference thereon, the incoming interferences and detected filtered interference coacting to nullify each other while said signal is amplified substantially minus interference.

5. In a wireless receiver a high frequency amplifying stage, an audio-frequency detector stage, means for impressing the entire plurality of incoming waves comprised of the signals to be received and the interference upon both of said stages, a filter having a lower limit substantially close to the upper audio frequency limit in operative association with the detector stage and having an output of detected interference of higher frequency than said signals, means operatively coupling the output of said filter to the high frequency stage to impress the detected filtered interference upon the high frequency stage with the entire plurality of incoming waves to block the high frequency stage against transmission of the interference.

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