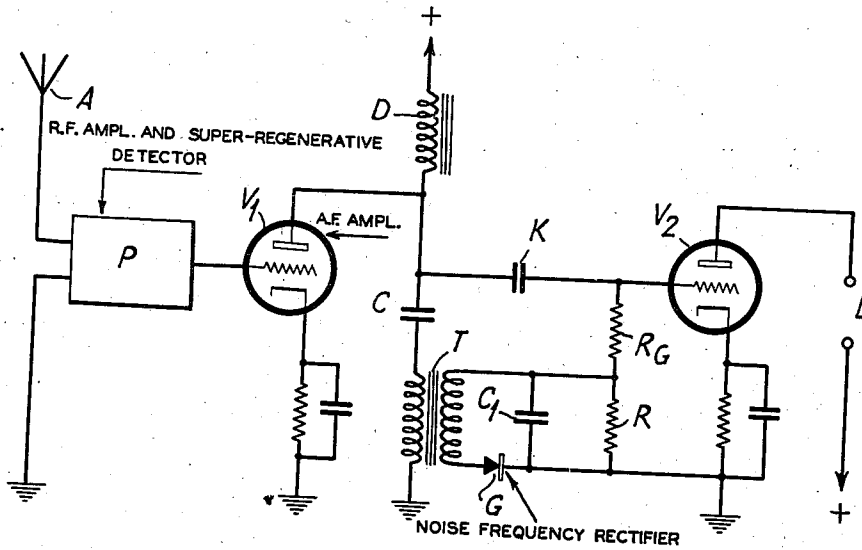


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K. SOHNEMANN
SUPERREGENERATIVE RECEIVER

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INVENTOR
KURT SOHNEMANN
BY *H.S. Brewer*
ATTORNEY

UNITED STATES PATENT OFFICE

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SUPERREGENERATIVE RECEIVER

Kurt Sohnemann, Berlin, Germany, assignor to
Telefunken Gesellschaft für Drahtlose Tele-
graphie m. b. H., Berlin, Germany, a corpora-
tion of Germany

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The conventional type of super-regenerative receiver apparatus as known in the prior art involves the drawback that outside the correct tuning to a transmitter station, very strong noises become audible, these noises disappearing only when the set is tuned to a transmitter station of sufficiently great field intensity and signal strength. This situation becomes particularly annoying if, as in two-way communication, the tuning is to the frequency of a transmitter which at the time happens to be inoperative, though the receiver apparatus must be prepared for the reception of its signal. The noise level during intermissions of reception becomes in such cases often unbearably high.

According to the present invention a filter is provided in the AF (audio frequency) amplifier of the super-regenerative receiver apparatus, said filter being designed to remove the frequencies inside the range lying between the practically important AF signal frequencies (say, 50–5000 cycles) and the bias or quench frequency (say, 20,000 cycles) which form part of the noise frequencies, or part thereof, for instance, the range between 10,000 and 15,000 cycles. The frequencies so filtered out, after rectification, are utilized for blocking the receiver.

The particular merit of the invention is that the receiver is automatically blocked in those intermissions of reception in which otherwise the disagreeable noise would arise, while upon collection of the station signal to be received the receiver is restored to a state ready for operation. It will be remembered that the frequency content of the noise extends all the way from very low frequencies up to frequencies of an order of the quench frequency, say, around 20,000 cycles and even beyond this limit. But the most marked frequency components of the noise lie inside the range of from 10,000 to 15,000 cycles.

By eliminating these frequencies and by rectifying them, it is an easy matter to secure a sufficiently strong control potential designed to effect the blocking of the receiver apparatus by ways and means known in the art. As soon as the desired station signal comes in, the noise disappears. Inasmuch as the filter does not eliminate practically any low-frequency signal frequencies and the bias frequency, the control voltage used for blocking decreases to a very low level with the result that the receiver is rendered operative.

An exemplified embodiment of the invention is shown in the drawing. The desired signal waves intercepted by the aerial A, if desired, after amplification, are fed to the super-regeneration recti-

fier P. The resulting AF (audio frequency) oscillation is fed to the grid of the input amplifier tube V1, the plate alternating potential of which by way of the coupling condenser K is impressed upon the control grid of the next amplifier tube V2. Included in the plate lead of the tube V2 is the loudspeaker or headset L. The D. C. plate potential is fed to the plate of tube V1 by way of a choke-coil D. At the same time, the plate by way of condenser C and the primary winding of transformer T is connected to ground. The size of the condenser C and of the inductance of the primary winding of transformer T are so chosen that the two provide a series circuit having a natural frequency around 12,000 cycles, the damping thereof being of such a value that the two cut-off frequencies of the transmission are approximately at 10,000 and 15,000 cycles. The secondary potential of transformer T is rectified by rectifier G which may be of the diode type or the copper-oxide or dry type. The rectified potential arises across the terminals of the load resistance R across which the condenser C1 is connected in parallel.

While the positive end of the load resistance R is directly connected with the grounded end of the cathode resistance of the tube V2, the negative end of the load resistance R is connected through leak resistance RG with the control grid of tube V2. If the noise is intense, such a high negative voltage arises across the resistance R that tube V2 is cut off. But when the noise ceases the voltage across resistance R will drop practically to zero level with the consequence that tube V2 operates with its normal grid bias voltage.

I claim:

1. In super-regenerative signalling apparatus for modulated wave reception of the type which in the absence of a signal is adversely affected to a considerable degree by noises having a frequency distribution including frequencies which are higher than the modulation frequencies but lower than the quench frequency, means for selecting and rectifying said higher frequencies without affecting said modulation and quench frequencies, and means utilizing the resulting rectified voltage for preventing reproduction of said noises when the amplitude of the resulting rectified voltage is greater than a predetermined amount.

2. In super-regenerative radio receiving apparatus for modulated wave reception of the type which in the absence of a signal is adversely affected by noises having a frequency distribution

including frequencies which are higher than the modulation frequencies and lower than the employed quench frequency, the method of preventing the passage of such noises through the receiving apparatus which comprises selecting and rectifying said higher frequencies without affecting said modulation and quench frequencies, and utilizing the resulting rectified voltage to squelch the receiving apparatus when the amplitude of the rectified voltage is greater than a predetermined amount.

3. In super-regenerative radio receiving apparatus for modulated wave reception, a modulation frequencies output circuit, said receiver employing a quench frequency higher than the modulation frequency range, an audio amplifier tube having an input circuit and an output circuit, a coupling between said modulation frequencies output circuit and said input circuit for feeding the modulation frequencies to said input circuit, a filter circuit connected to said modulation frequencies output circuit and arranged to filter out modulation frequencies which are above the upper end of the modulation range and less than said quench frequency, a rectifier circuit coupled to said filter circuit for rectifying said filtered modulation frequencies and means for

applying the resulting rectified voltage as a bias voltage to said tube.

4. In radio receiving apparatus for modulated wave reception including a pair of terminals across which audio frequency energy is available, an audio frequency amplifier tube having an anode, a cathode, and a grid electrode, a load, means including a source of direct current for connecting said load between said anode and cathode, a condenser connected between one of said terminals and said grid electrode, a circuit comprising a condenser and the primary of a transformer in series, connected between said two terminals, said condenser and primary of the transformer being tuned so as to filter out of said audio frequency energy, audio frequencies of higher frequency than the modulation frequencies, a pair of resistors in series, connected between said grid electrode and cathode, a rectifier and a condenser in series, connected across the secondary winding of said transformer, conductive means connected between one end of said last named condenser and a point common to said two series resistors and conductive means connecting the other end of the condenser to said cathode.

KURT SOHNEMANN.