Feb. 25, 1936. G. CORBETT 2,032,117

RADIO VOLUME CONTROL

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Fig. 1.

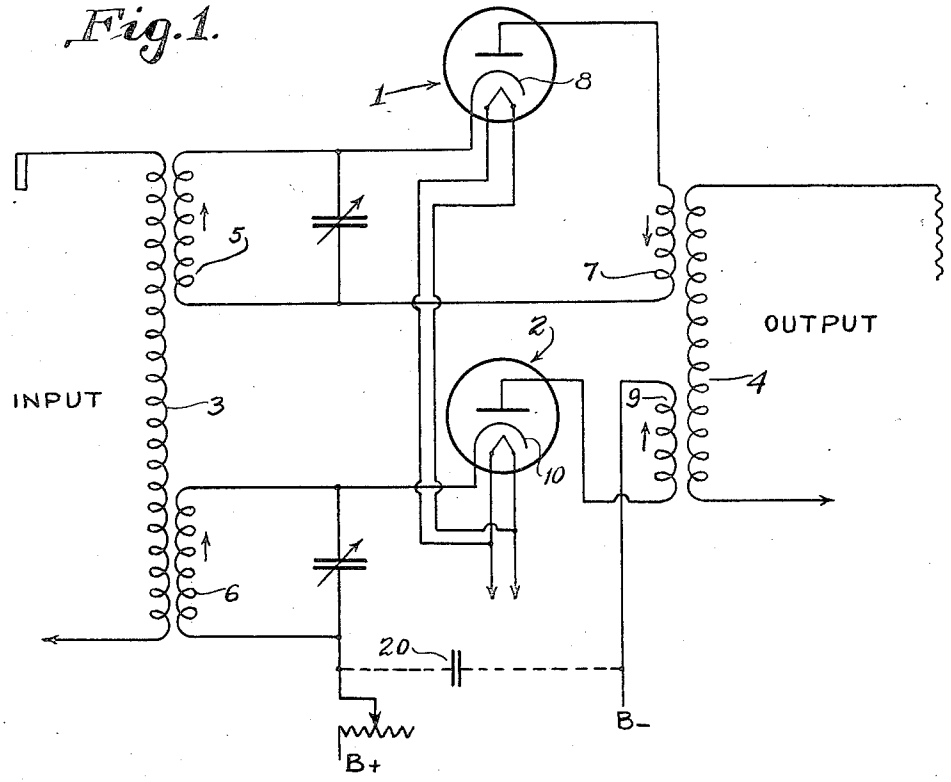
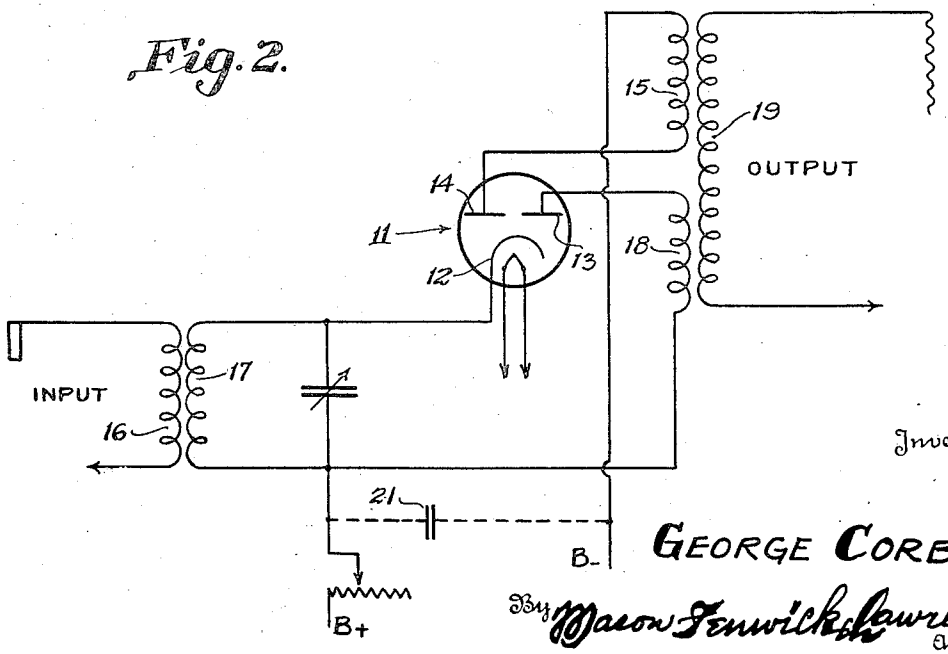


Fig. 2.



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RADIO VOLUME CONTROL

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1 Claim. (Cl. 250—20)

This invention forming the subject matter of this application relates broadly to volume control systems adapted to use in a radio receiver.

The main object of the invention is to provide a very simple and inexpensive volume control which may be readily applied in the radio frequency or intermediate frequency amplifying stages of a broadcast receiver to maintain the volume of the receiver output at a desired and substantially constant strength.

Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawing:

Figure 1 is a diagram illustrating the circuit arrangement of the present invention, as applied in the high frequency amplifying part of a radio receiver; and

Figure 2 is a similar diagram of a modified form of the invention.

As shown in Figure 1 of the drawing, the volume control comprises the two-element rectifiers 1 and 2 having their filaments connected suitably to any source of heater current. These tubes and their operating elements are arranged between the output coil 3 of a preceding tube and the input coil 4 of a succeeding tube in the high frequency amplifying part of a broadcast receiver. It will be understood, of course, that the output of the said preceding tube of the receiver is the input of the volume control; and that the output of this control constitutes the input of the receiver tube succeeding said control. The coils 3 and 4 are, therefore, to be considered as a diagrammatic representation of the usual broadcast receiver having this control applied thereto.

In the tube 1 there is no bias between the plate and cathode. The plate and cathode of tube 2, however, are connected suitably to a source of steady voltage, the cathode of tube 2 being positive relative to its plate and having its potential adjustable, so as to make potential difference equal to the strength of signal desired.

The input from coil 3 is divided equally between the parallel coils 5 and 6 of the tubes 1 and 2, respectively. Obviously, when signals energize the coil 3, the tube 1 acts as a simple detector, current flowing through the coil 7 on the alternation which makes the cathode 8 negative. Obviously, too, no current would flow in coil 9 of tube 2, unless the signal be stronger than the positive voltage on the cathode 10 of tube 2; in which case, the excess voltage in coil 9 would oppose the voltage in coil 7, and keep the voltage induced in coil 4 substantially constant and at the desired signal strength.

In the modification shown in Figure 2, a full wave rectifier 11 is substituted for the single plate rectifiers shown in Figure 1. The cathode 12 and plate 13 are at the same potential with respect to each other. As in the other form of the invention, the potential of the cathode 12 is made positive relative to the plate 14, and may have its potential varied to secure any desired potential difference equal to the strength of signal desired.

The operation of this form of the invention is the same as that shown in Figure 1. No current flows in coil 15 unless the signal energizing the coils 16 and 17 be stronger than the positive voltage on the cathode 12, in which case, the excess voltage in coil 15, would oppose the voltage in coil 18, and bring the induced voltage in coil 19 down to the desired strength. Whenever found desirable, a by-pass condenser 20 may be connected across the source of direct biasing current in either form of the invention disclosed herein.

One of the decided advantages of this system over prior systems of volume control resides in the fact that whenever stray signals, stronger than that for which the volume control is adjusted, are imposed upon the receiver, it is at once cut down to the strength of the desired signal. In prior systems, both the desired and the stray signals are reduced in the same proportion.

What I claim is:

A radio receiving system having a plurality of amplifying stages; a two plate rectifier; a circuit including one plate of said rectifier interposed between the output of one of said stages and the input of the next succeeding stage to transmit signal energies from said output to said input; and a second circuit including the other plate of said rectifier and operable only by signal energies in excess of a predetermined maximum, the induced current in the second circuit bucking the output current of the first circuit to maintain constant the volume of signal energies transmitted from the output of the first named stage to the input of the next succeeding stage, and means for varying the potential of the cathode of said rectifier relative to said other plate to secure any potential difference equal to the strength of signal desired.

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