This invention relates to an amplifier-filter circuit characterized in this that a band filter circuit is associated with the output circuit of a vacuum tube amplifier in such a connection that a suitable portion of the voltage at the input side of said filter is fed back to the grid of said vacuum tube so that the attenuating frequency region of the filter is suppressed, and a portion of the voltage at the output side of said filter is also fed back to the grid of said vacuum tube so that the passing frequency region of said filter is regenerated.

The object of this invention is to obtain an effective and reliable amplifier-filter circuit.

In the accompanying drawing:

Fig. 1 shows two simple filter circuits used in this invention; and Fig. 2 shows a circuit embodying this invention, in which the filament batteries are not indicated.

This invention has as its object to obtain an amplifier-filter circuit, that is, a circuit by which a special frequency band is amplified and filtered, and said circuit can be efficiently used in electrical transmission circuits in general.

According to this invention, the circuit comprising two simple band filters A and B in Fig. 1 connected in tandem, is adapted to perform as a filter and an amplifier, and as special connections are employed in its amplifying device, the amplifier-filter action of this circuit is accomplished more effectively and reliably than others.

In Fig. 2 showing one embodiment of this invention, the circuit formed by inductances 6, 14 and capacities 7, 15 corresponds to the filter A in Fig. 1, and the circuit formed by inductances 6, 16 and capacities 7, 17 corresponds to the filter B in Fig. 1. These two filters are connected in tandem and by means of two vacuum tubes 1 and 2, they are inserted between receiving terminals 3 and sending terminals 4, so that a special network circuit is formed.

When a voltage is applied to the receiving terminals 3 of the network, this voltage is amplified by the vacuum tube 1, filtered by the said filter network, and only the passing frequency region of the filter is applied to the vacuum tube 2 and amplified therein. Said amplified voltage of the passing region appears at the sending terminal 4. It should be noticed that special connections are provided at the output circuit of the vacuum tube 1 in order to feed portions of the voltages at the input side and the output side of the filter back to the grid of the vacuum tube.

Said special connections are as follows: At the input side of the filter, the winding 9 of the transformer 5 is connected retroactively to the grid of the vacuum tube 1 in order to feed back a suitable portion of the input voltage so that the attenuating frequency region of the filter is effectively suppressed, and at the outgoing side of the filter, the winding 13 of the transformer 12 is connected also to the grid of the vacuum tube 1 in order to feed back an electromotive-force due to the voltage or current at the outgoing side, so that the passing frequency region of said filter is regenerated.

As the circuit according to this invention is connected as stated above, the suppressive action of the circuit for the passing region of the filter is reduced and the suppressive action of the circuit for the attenuating region is increased. Therefore the filter and the amplifier actions of this circuit are well performed.

In this amplifier-filter circuit, it is obvious that any suitable modification may be accomplished, such for an example, the elimination of the inductance 6.

What is claimed is:

1. An amplifier-filter circuit characterized in this that a band filter circuit is associated with the output circuit of a vacuum tube amplifier in such a connection that a suitable portion of the voltage at the input side of said filter is fed back to the grid of said vacuum tube so that the attenuating frequency region of the filter is suppressed, and a portion of the voltage at the output side of said filter is also fed back to the grid of said vacuum tube so that the passing frequency region of said filter is regenerated.

2. An amplifier-filter circuit according to the preceding claim characterized in this that the band filter associated with the output circuit of the amplifying vacuum tube may comprise two simple band filters connected in tandem.

In witness whereof, I hereunto subscribe my name this 23rd day of July, 1932.

HEIICHII NUKIYAMA.