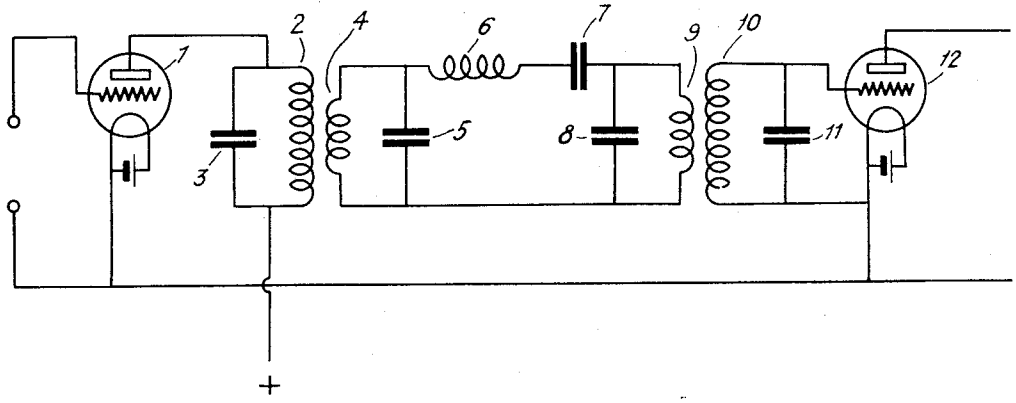
Dec. 12, 1933. K. POSTHUMUS ET AL 1,938,640

INTERMEDIATE FREQUENCY AMPLIFIER

Filed Jan. 25, 1932



INVENTORS
KLAAS POSTHUMUS
THEODORUS J. WEYERS

BY H. T. Grover

ATTORNEY

Patented Dec. 12, 1933 1,938,640

UNITED STATES PATENT OFFICE

1,938,640

INTERMEDIATE FREQUENCY AMPLIFIER

Klaas Posthumus and Theodorus Josephus Weyers, Eindhoven, Netherlands, assignors to Radio Corporation of America, a corporation of Delaware

Application January 25, 1932, Serial No. 588,626, and in France and Belgium June 25, 1931.

2 Claims. (Cl. 179—171)

Superheterodyne receivers require amplifiers adapted to amplify selectively a more or less wide band of mean-frequency oscillations. For this purpose tuned transformers are usually utilized as coupling elements between the amplifier valves. In order to obtain an amplification characteristic curve which is as rectangular as possible, it is advisable to utilize a band filter in one of the series-branches of which are connected in series an inductance and a capacity of such values that said branch forms a short-circuit for the mean frequency of the band to be transmitted. In this case a drawback consists in that said inductance, which must be adapted to the very high self-induction of the transformer windings, must be chosen so large as to be almost impracticable due to which the series condenser becomes so small as to be almost impracticable.

According to the invention, this drawback is removed by arranging this tuned series branch between a step-down output transformer and a step-up input transformer. The self-inductions of the secondary and the primary winding respectively of these two transformers may be comparatively small and the self-induction of the series branch may be adapted to them.

The invention will be more clearly understood by referring to the accompanying drawing which represents, by way of example, a two-stage mean-frequency, or intermediate frequency amplifier of a super-heterodyne receiver according to the invention.

In the anode circuit of a mean frequency amplifier tube 1 is connected a primary winding 2 of an output transformer and in parallel therewith a condenser 3 in such manner that the circuit 2, 3 is tuned to the mid-band frequency of the modulation band which is to be selectively amplified. This mid-band frequency is, of course, the operating intermediate frequency. On account of the high internal resistance of the tube 1 the self-induction of the coil 2 must have a comparatively large value.

The secondary winding 4 of the output transformer has much fewer turns than the winding 2 and is tuned by a parallel condenser 5 to the same frequency as the circuit 2, 3. On the input side of the following intermediate frequency tube 12 is arranged an input transformer 9, 10 whose two windings are tuned by condensers 8 and 11 respectively to the above-mentioned mid-band frequency. The primary winding 9 comprises considerably fewer turns than the secondary winding 10. Between the two circuits 4, 5 and 8, 9 is inserted a tuned series branch 6, 7, the inductance 6 of which is matched to the comparatively small self-induction of the windings 4 and 9 respectively. Owing to this the coil 6 and the condenser 7 acquire values lying within limits of practicability.

While we have indicated and described one arrangement for carrying our invention into effect, it will be apparent to one skilled in the art that our invention is by no means limited to the particular organization shown and described, but that many modifications may be made without departing from the scope of our invention as set forth in the appended claims.

What is claimed is:

1. An intermediate frequency amplifier comprising a pair of cascaded amplifier tubes, a coupling network connected between the output electrodes of the first of said tubes and the input electrodes of the second tube, said network consisting of a step down transformer having its primary coil in the anode circuit of the first tube, a step-up transformer having its secondary in the grid circuit of the second tube, a condenser connected across each of the windings of said transformers to provide four resonant networks each tuned to said intermediate frequency, and a series resonant path, tuned to said frequency, connected between points of like potential of the secondary of the step down transformer and the primary of the step up transformer, the inductive reactance of said path being chosen to match that of the last named secondary and primary.

2. An intermediate frequency amplifier comprising a pair of cascaded amplifier tubes, a coupling network connected between the output electrodes of the first of said tubes and the input electrodes of the second tube, said network consisting of a step down transformer having its primary coil in the anode circuit of the first tube, a step up transformer having its secondary in the grid circuit of the second tube, a condenser connected across each of the windings of said transformers to provide four resonant networks each tuned to said intermediate frequency, and a series resonant path, tuned to said frequency, connected between points of like potential of the secondary of the step down transformer and the primary of the step up transformer, the inductive reactances of the last mentioned secondary and primary being comparatively small, the inductive reactance of said path being chosen to match that of the last named secondary and primary.

KLAAS POSTHUMUS.
THEODORUS JOSEPHUS WEYERS.