Jan. 2, 1923. 1,441,029.

H. J. ROUND.

TRANSMITTER FOR TELEPHONY.

FILED MAR. 31, 1920.

Fig. 1.

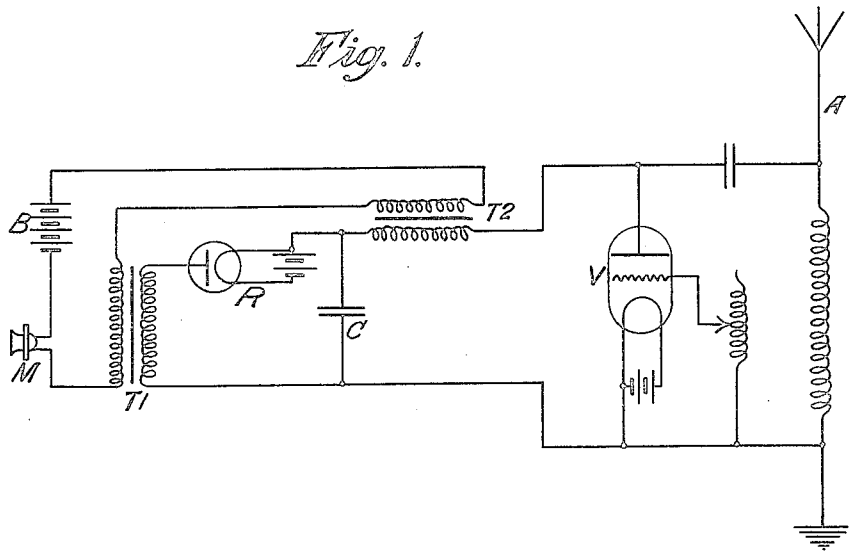
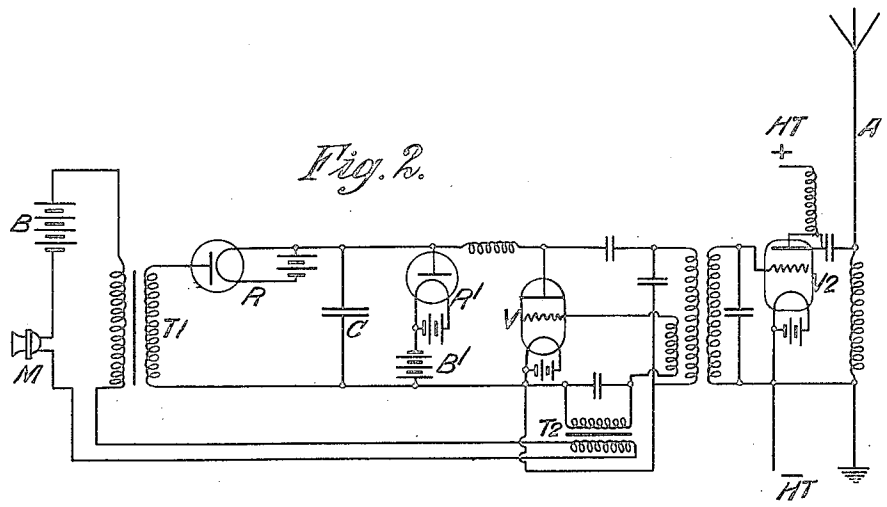



Fig. 2.

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Inventor
By Ira J. Adams.
atty

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# UNITED STATES PATENT OFFICE.

HENRY JOSEPH ROUND, OF LONDON, ENGLAND, ASSIGNOR TO THE RADIO CORPORATION OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

## TRANSMITTER FOR TELEPHONY.

Application filed March 31, 1920. Serial No. 370,177.

*To all whom it may concern:*

Be it known that I, HENRY JOSEPH ROUND, a subject of the King of Great Britain, residing at 9 Woodberry Crescent, Muswell Hill, London, England, have invented new and useful Improvements in Transmitters for Telephony, of which the following is a specification.

This invention relates to improvements in telephone transmitters of the type employing thermionic generators, and its object is to provide an arrangement whereby the generation of the continuous waves upon which the sound vibrations are impressed is controlled by the voice.

It is well known that the necessity for starting these continuous waves when it is desired to speak and for stopping them when it is desired to listen is an impediment to free conversation as some switching device is usually required.

According to this invention, means are provided whereby the voice itself causes both direct and alternating current, to be fed to a thermionic generator, the direct current, starting with the voice and stopping with the voice, causes continuous waves to be generated while the alternating current causes the amplitude of these waves to be varied.

Preferably there is connected to the generator a large condenser connected through a rectifier to a transformer in the microphone circuit so that any vibrations of the current in this circuit give the condenser a charge which leaks rapidly away when the vibrations cease. The microphone is also connected to the primary of another transformer, usually in series with the large condenser and with a smaller one which forms part of the oscillatory circuit.

This invention is illustrated by the accompanying drawing which shows it as applied to wireless telephony, Fig. 1 being a diagrammatic illustration of circuit arrangements embodying the invention and Fig. 2 a similar view of a modification.

In Figure 1 M is a microphone connected in series with a battery B and the the primaries of two transformers T1 and T2. The secondary of T1 is connected through a rectifying valve R to a condenser C one side of which is connected to the filament of a thermionic generator V while the other side is connected through the secondary of T2 to the anode of the generator V connected to an aerial A. It will be seen that since there is no source of potential such as the usual battery in the anode filament circuit of V there will be no generation of oscillations by V until speech is commenced when direct current will be fed to the anode filament circuit from the charge in condenser C, due to the transformer T1 and the rectifier R. The valve will then generate continuous waves the amplitude of which will be varied according to the speech by the alternating currents fed to the valve by the transformer T2 and the envelope of the oscillations will correspond to the alternating current wave and the speech will be reproduced at the receiving end without distortion.

If the windings of T1 and T2 are such that a fairly large part of the energy goes to the production of the direct current and only a smaller part to the production of the alternating current, a rapid rise of direct current potential is obtained on the condenser as soon as speech starts.

In order, however, to prevent this potential from rising to more than a definite value, a limiting device may be employed which by limiting the potential on C speeds up the dying away when the speech stops, as shown in Figure 2, where rectifier valve R1 and battery B1 represent the limiting device.

In this arrangement also is shown the alternating current produced by the voice as acting on the grid of the generating valve V and the resulting oscillations are then magnified by the valve circuit V2, having a high voltage input source HT connected across the plate and filament. The magnified oscillations are supplied by the valve V2 to the antenna A.

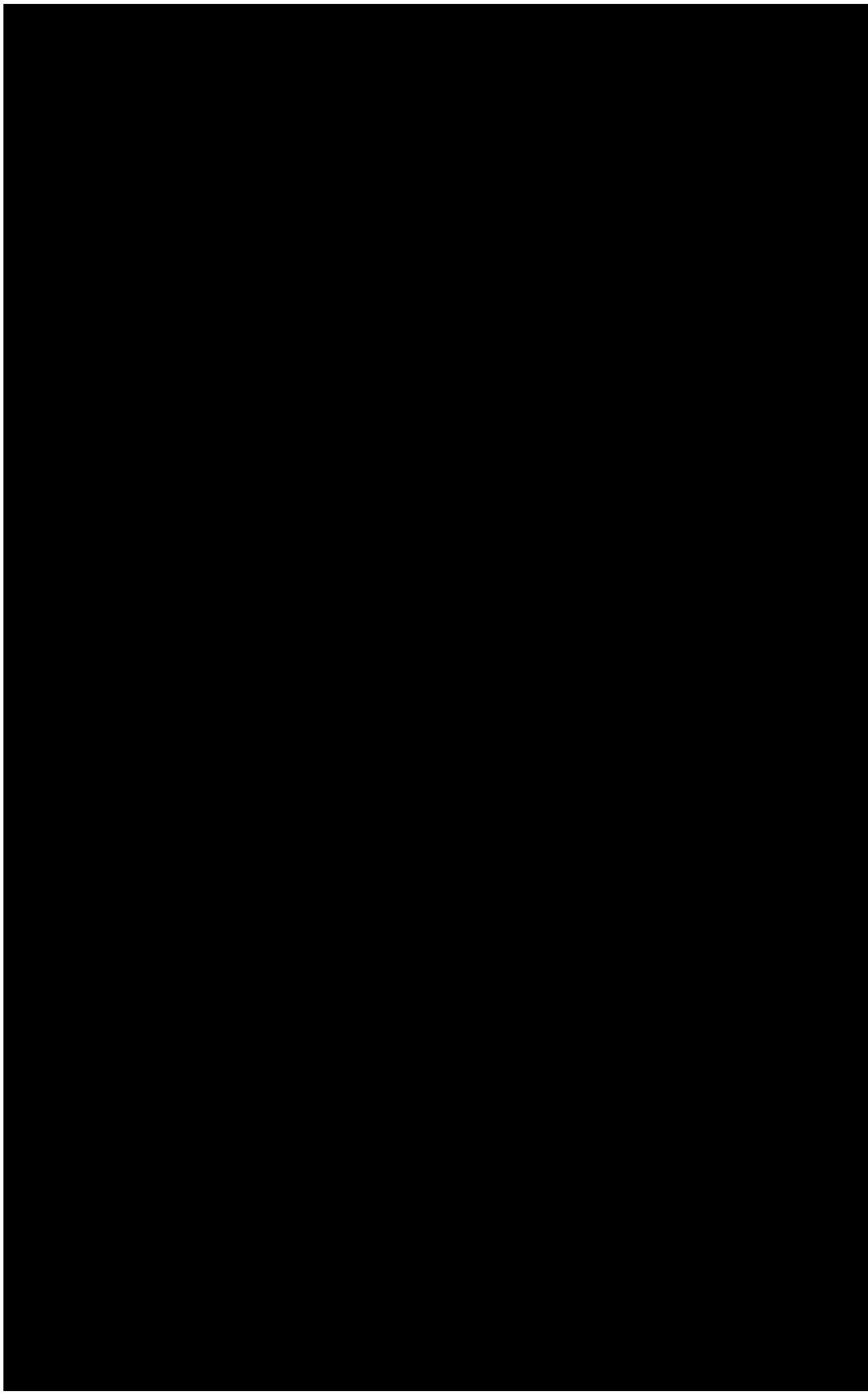
These two diagrams are shown merely as illustrations of the invention which is not limited to these circuits in particular.

The continuous waves may be varied by the voice in any of the well known methods.

What I claim is:—

1. In a telephone transmitter, the combination of a thermionic generator, a rectifier and means whereby the voice causes direct current to be supplied to the generator from the rectifier.

2. In a telephone transmitter, the combination of a thermionic generator, a rectifier,



rectifier and a condenser, a three electrode valve comprising a plate, filament and grid, said plate and filament being connected to said condenser, means for coupling said grid to the first mentioned circuit and an oscillation circuit connected to the plate and filament.

17. In a telephone transmitter, the combination of a circuit containing a microphone and a source of direct current, a second circuit coupled to the first circuit containing a rectifier and a condenser, a three electrode valve comprising a plate, filament and grid, said plate and filament being connected to said condenser, means for coupling said grid to the first mentioned circuit and an oscillation circuit connected to the plate and filament, and means for coupling the grid to the oscillation circuit.

18. In a telephone transmitter, the combination of a thermionic generator, a rectifier, a condenser cooperating with the generator, and means whereby the voice causes current to be supplied to said condenser from said rectifier.

19. In a telephone transmitter, the combination of a thermionic generator, a rectifier, a condenser cooperating with the generator, means whereby the voice causes current to be supplied to the condenser from the rectifier, and means whereby the voice is caused to vary the high frequency current produced by the generator.

20. In a telephone transmitter, the combination of a microphone, a source of current, two transformers, a rectifier, a condenser connected in series with the rectifier and with the secondary of one transformer, a device adapted to limit the potential on the condenser, and a thermionic generator comprising a filament, a grid and an anode, the anode being connected to one side of the condenser and the grid being connected to the other side of the condenser through the secondary of the second transformer.

In testimony that I claim the foregoing as my invention I have signed my name this 23rd day of February 1920.

HENRY JOSEPH ROUND.