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C. V. LOGWOOD

ELECTRICAL SIGNAL SYSTEM

Filed May 28, 1921

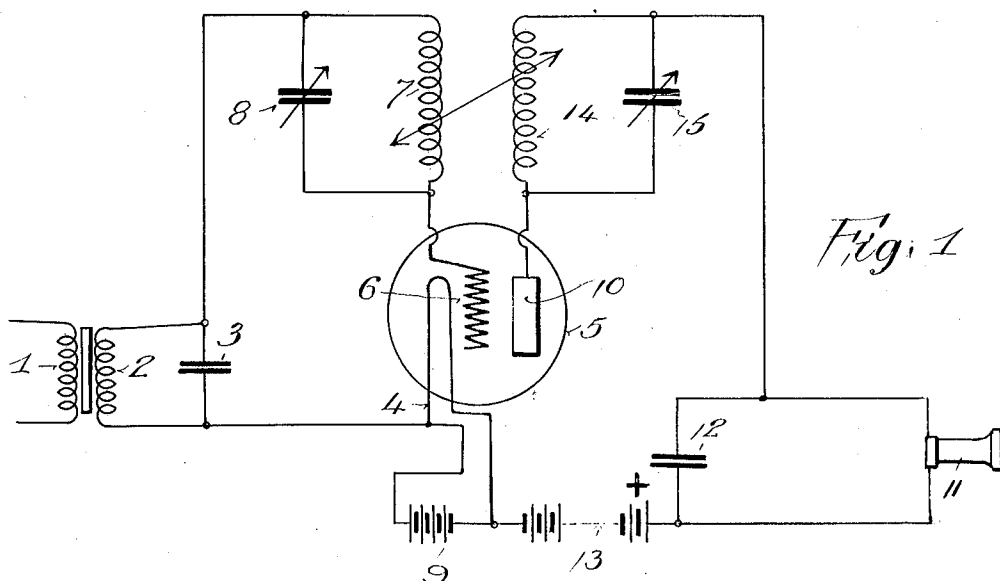


Fig. 1

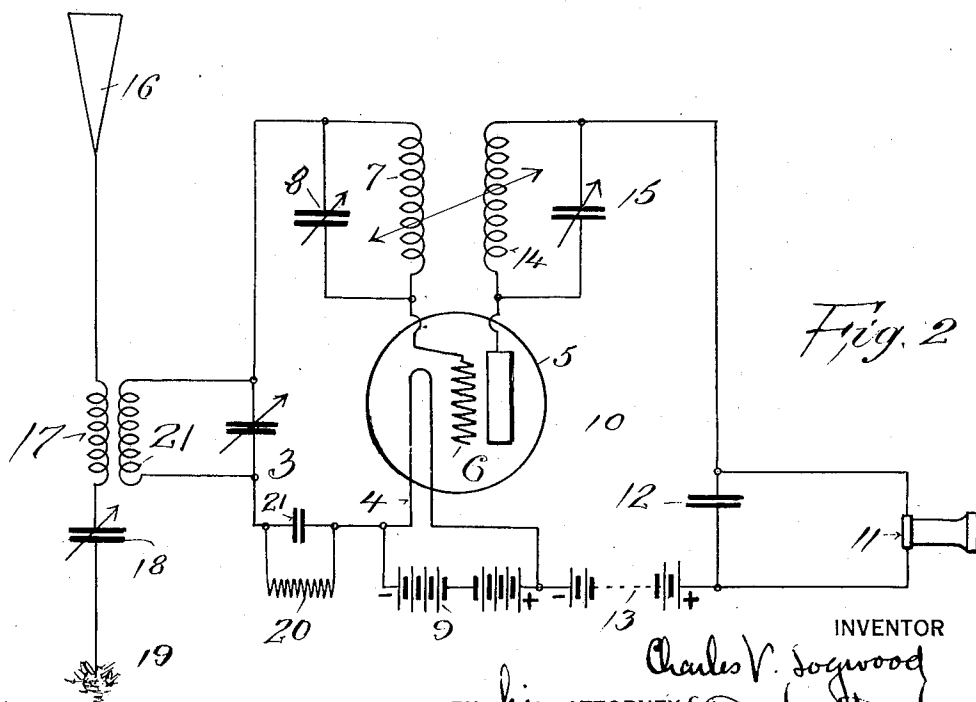


Fig. 2

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ELECTRICAL SIGNAL SYSTEM.

Application filed May 28, 1921. Serial No. 473,362.

This invention relates to electrical signal systems, and more particularly to such systems wherein the three electrode audion is employed.

The object of the invention is to provide an electrical signalling system which is simple in structure, efficient in operation, and wherein certain novel circuit arrangements employed in connection with the three electrode audion to enable certain novel results by the use thereof.

A further object of the invention is to provide in a single audion circuit arrangement a combined detector of audio frequency currents and amplifier of radio frequency currents.

Further objects of the invention will appear more fully hereinafter.

The invention consists substantially in the construction, combination, location and relative arrangement of parts, and the circuit arrangement employed in connection therewith, all as will be more fully hereinafter set forth, as shown by the accompanying drawing and finally pointed out in the appended claim, wherein

Fig. 1 is a diagrammatic view showing the audion circuit arrangement embodying my invention;

Fig. 2 is a similar view showing a slightly different use of the circuit arrangement embodying my invention.

The same part is designated by the same reference character wherever it occurs throughout the two views.

In Fig. 1 I have illustrated my invention as applied to the reception of audio frequency signals wherein audio-frequency signals are received from a suitable source by coil 1 of the audio frequency transformer. It is wholly immaterial, so far as my invention is concerned, from what source the audio frequency signals are received, for example, they may be received over a line wire, or they may be received through ether. The secondary coil 2 of the audio frequency transformer is preferably shunted by the condenser 3, and is connected at 1 to the terminal of the filament electrode 4 of the audion 5, the other terminal being connected to the grid electrode 6 of said audion. The grid filament circuit includes an air core transformer coil 7 shunted by a suitable and preferably adjustable capacity such as a condenser 8. The filament elec-

trode 4 of audion 5 is heated in the usual manner by means of a current source 9, and the plate electrode 10 of the audion 5, is connected to the filament 4 in the usual manner through the circuit which includes a signal indicating device such as the telephone receiver 11, preferably shunted by a condenser 12, in which circuit is also included the usual B source, for example, the battery 13. The plate filament circuit includes the inductance coil 14 shunted by a suitable variable capacity, for example, the variable condenser 15, and the coils 7 and 14 inductively associated with each other in an adjustable manner, as will be readily understood on inspection of the drawing. In the arrangement thus shown it will be readily seen that I have provided in a single audio arrangement a combined detector of audio frequency currents and amplifier of radio frequency currents, for it will be apparent to those skilled in the art that by means of the grid filament circuit being inductively coupled with the plate filament circuit, and both including an oscillating circuit, the audion becomes a source of sustained high frequency oscillations. For example, if telephone currents are received by the transformer coil 1, the current impulses are detected by the audion in the usual well known manner. At the same time, however, the audion is serving as a source of sustained high frequency oscillations, and the high frequency oscillations generated by the audion are modulated by means of the low frequency impulses received by the telephone transformer 1, with the result that the modulated frequency oscillations generated by the audion thus modulated are fed back from the plate filament circuit to the grid filament circuit in a condition greatly amplified, due to the inherent amplifying quality of the audion whereby reamplification of oscillating currents is effected. It will be readily seen, therefore, that the signals detected by the receiver 11 may be greatly amplified.

In Fig. 2 I show the invention applied to the reception of signals received from an aerial into an antenna earth system which is designated at 16, 17, 18 and 19, wherein 16 is the aerial, 17 the primary winding, 18 the variable capacity, and 19 the ground connection. The signals received are impressed by the primary winding 17 to the secondary winding 21, which is shunted by a condenser

3, which condenser may in either instance be variable, as shown in Figure 2, or a fixed condenser, as shown in Fig. 1.

In the foregoing arrangement, the two oscillatory circuits 8-7 and 21-3 are tuned to different frequencies whereby a beat note is produced. This tuning is effected so that the beat note is ultra audio or inaudible, and is not rendered audible until the rectification process of the audion 5 does so.

Many modifications and changes in detail will readily occur to those skilled in the art without departing from the spirit and scope of my invention, for example, the usual type of high resistance leak shown at 20 shunting a condenser 21 may be employed in the grid filament circuit. Further, many other refinements and developments in the audion art may be employed in this circuit, which, for the sake of simplicity and clarity of disclosure has been stripped of unessential details.

Having now set forth the objects and nature of my invention, and having shown a structure embodying the principles of my invention, what I claim as new and useful and of my own invention, and desire to secure by Letters Patent, is:

The combination with a source of alternating current of an audion having input and output circuits, the input circuit including two inductances in series and each shunted by a variable condenser to provide tuned circuits and the output circuit including an inductance shunted by a variable condenser, said input and output circuits being inductively coupled together, the tuned circuits in said input circuit being tuned to different frequencies and said source being directly associated with only one of said tuned circuits.

In testimony whereof I have hereunto set my hand on this 24 day of May A. D., 1921.

CHARLES V. LOGWOOD.