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KEYING MONITOR

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Fig. 1.

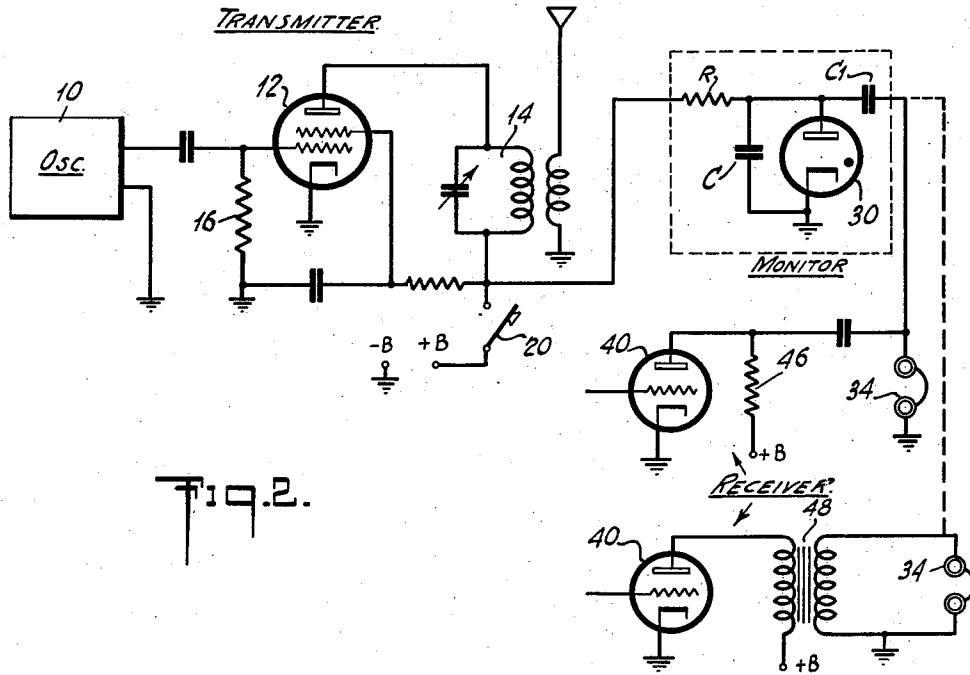
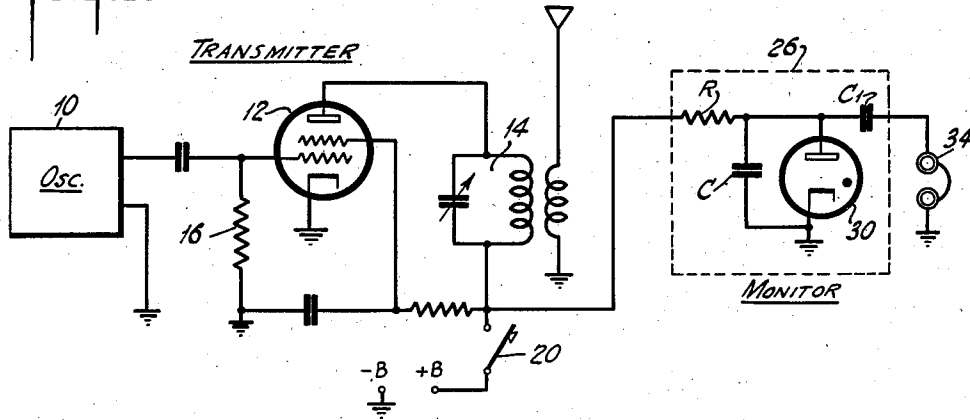


Fig. 2.

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KEYING MONITOR

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4 Claims. (Cl. 250-17)

In telegraph systems it is desirable to have at the transmitter means for aurally monitoring the keyed wave being transmitted.

The manual keying of a radio telegraph transmitter can in most instances be improved for the operator if some means are available for monitoring the keyed signals.

The general object of this invention is to improve aural monitoring of telegraph signals. Heretofore two general methods have been employed. In one of these methods oscillations from a heterodyne oscillator are mixed with a signal from the radio frequency section of the transmitter to provide an aural beat note which may be observed. The other method involves use of an audio oscillator which is actuated by the key and does not make use of the heterodyne principle.

A more detailed object of this invention is to provide an improved aural monitor of the second type described above, wherein an audio oscillator is actuated by the key and heterodyning oscillations are unnecessary.

A still further object of this invention is to provide monitoring means for use in light weight compact telegraph systems operating on batteries or other perishable power supplies.

A still further object of this invention is to provide a simplified light weight monitor which requires extremely little operating power, the required power in fact being so small that it is practically negligible and may be disregarded when considering the power supply for the transmitter.

The above objects and others which will appear in the description which follows, are attained by providing a simple relaxation type oscillator employing a gaseous tube such as a small neon tube connected with an RC network and keyed as the transmitter is keyed. The values of R and C of the network are chosen so as to produce the desired audio frequency. The wave generated, which is of audible frequency, is applied to some type of transducer for observation, for example, a telephone head set.

A feature of the invention resides in the compactness of the monitor, the simplicity thereof, as well as in the small amount of power required to operate the same. This is of considerable importance where the transmitter and monitor must be of small dimensions and of light weight for portable use.

In describing our invention more in detail reference will be made to the attached drawing wherein Figs. 1 and 2, each show a monitoring

arrangement associated with a transmitter, all in accordance with our invention.

In Fig. 1, at the left, is shown a transmitter of a simple type comprising a source of oscillations 10, a final amplifier stage including a tube 12 having its grid and cathode excited by oscillations from source 10 and its anode coupled with a tank circuit 14 in turn coupled with utilizing means such as, for example, radiating means. It should be noted that bias for the control grid can be supplied by any of the conventional methods, for example, by a leak resistance 16, while the remaining electrodes, except the cathode, is supplied by operating potentials from a single source. The transmitter is keyed by manipulating the key 20 in the direct current supply lead to the anode and screen grid of tube 12. Other types of transmitters may be used, provided they include a direct current keying circuit.

The monitor all of which is included in the dotted rectangular 26, comprises a gaseous tube 30 having its electrodes shunted by a condenser C, with the tubes anode and condenser C coupled by resistance R to the direct current circuit completed by key 20 in operation. Transducer means, such as a telephone head set 34, is coupled to the monitor by a condenser C1.

In operation when the key 20 is closed, to signal, condenser C is charged through resistance R. When the charge on C reaches a critical value the tube 30 breaks down and changes from a high impedance to a low impedance and conducts. Oscillations are thereby generated of a frequency depending on the rate at which C is charged through resistance R to the said critical value and discharged by the tube 30. This rate in turn depends on the values of R and C.

The choice of values of R and C will depend upon two conditions, first, the voltage required to operate the gas tube, and second, the desired audio monitor frequency. The condenser C1 is made large enough to provide sufficient coupling of the generated oscillations to the transducer 34. The wave form of a relaxation oscillator of this type is a saw tooth, but since it is used only for monitoring, it is found to be perfectly satisfactory.

In the modification in Fig. 2, the keying monitor is used as described above and serves an additional purpose which will now be described.

The terminal at which the transmitter is located usually includes a radio receiver and the two may be used alternately to communicate to other somewhat similar stations. The receiver may be of any desired type and has not been

shown in detail. It will, however, include an output tube 40 having its anode coupled to a transducer and in accordance with our invention the transducer may serve in the monitor so that the anode of the tube 40 is coupled by condenser 46 to the transducer 34. Now when the transmitter key 20 is in the up position, that is, non-operative, the gas tube 30 remains coupled for audible frequencies, across the receiver output. When the receiver output level reaches a value such as to break down the gas tube 30, the impedance thereof becomes low. In this manner a peak limiting action is obtained and this action is of considerable value in reducing disturbing noises such as static, etc.

The stage 40 in the receiver wherein the peak limiting is accomplished, may have a resistive-capacitive output as shown at 46, or a transformer output 48. In the latter case, the connection is made as shown in dotted lines. In the latter case, the tube 30 may be connected across the secondary winding of the transformer 48.

An additional benefit derived from the use of our monitor resides in the fact that since R and C are, as stated above, adjusted so that potentials of a selected value operates the oscillation generator, if the power supply potential falls below this value oscillations will not be produced and this is an efficient means for checking the condition of the power supply.

It will be obvious that our improved monitor, as illustrated in Figs. 1 and 2, uses a very small number of parts, thereby adding little to the expense of the system and to the weight thereof and to the power used thereby. Low power drain on the battery operated apparatus is thus assured. Moreover, the monitor requires a small space for installation.

The tube 30 used was of the type GE-type T-12, and is about 1 inch long and 1/4 inch in diameter. R and C and C1 are also very small.

We claim:

1. In combination with a transmitter having a

radio frequency stage wherein radio frequency energy is relayed, and a source of direct current potential is connected to said stage by a key, a monitor comprising a tube having electrodes coupled in a circuit for the production of oscillations of tone frequency when direct current potential of proper value is supplied to the said circuit, a coupling including said key when closed between said circuit and said source, and a transducer coupled to said oscillation producing circuit.

2. In combination with a transmitter having a radio frequency stage wherein radio frequency energy is relayed, and a source of potential is connected to said stage by any known modulation method such as a key, a monitor comprising a relaxation oscillator including a tube having electrodes, a condenser coupled to said electrodes, a charging resistance for said condenser coupling said condenser through said key when closed to said source, and a transducer coupled to the oscillator.

3. In combination with a signalling system, a radio frequency stage wherein radio frequency energy is relayed, and a source of potential is connected to said stage by a key or its equivalent, and a circuit wherein currents representing audible signals appear, an aural monitor comprising a relaxation oscillator including a tube having electrodes, a condenser coupled to said electrodes, a coupling including a charging impedance and said key when closed coupling said condenser to said source, and a transducer coupled to the oscillator and to said circuit wherein said currents representing signals appear, the arrangement being such that when the key is closed oscillations are generated in said tube for monitoring purposes, and when the key is open said tube acts as a peak limiter for the currents in said last mentioned circuit.

4. A combination as recited in claim 2, wherein said condenser is in shunt to the tube electrodes.

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