PUBLISHED
MAY 25, 1943.
BY A. P. C.

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TRANSMITTERS FOR TESTING RADIO RECEIVERS

Filed July 5, 1941

Serial No.
401,099

FIG.1.

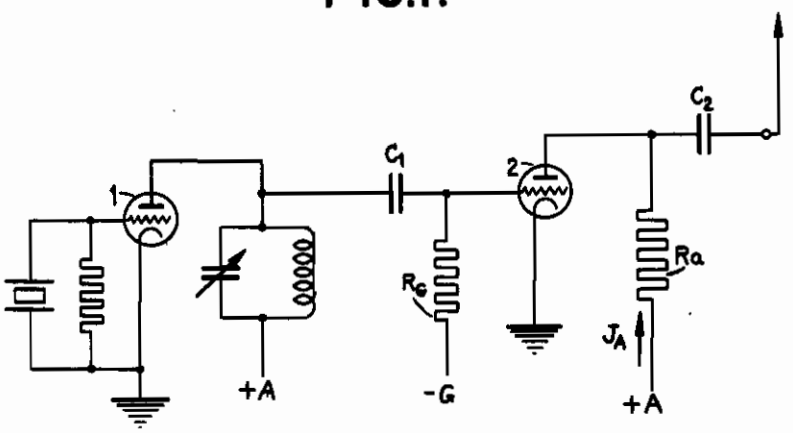
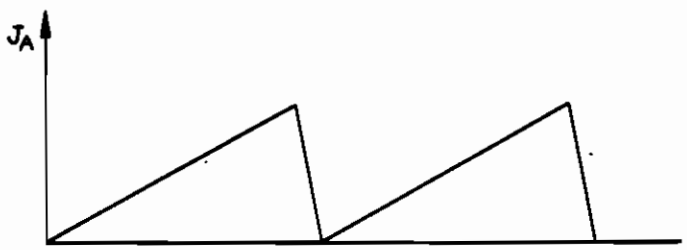


FIG.2.



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Published May 25, 1943

Serial No. 401,099

ALIEN PROPERTY CUSTODIAN

TRANSMITTERS FOR TESTING RADIO RECEIVERS

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Application filed July 5, 1941

For testing direction finding receivers and the like a small measuring transmitter has to be erected on the test floor. This transmitter is arranged to radiate a nearly constant field intensity in order to provide for testing the compensation of site error and for ascertaining the direction finding properties of the receiver. For this purpose it has been necessary continually to supervise the frequency and field intensity of such tests transmitter because supply lines from the receiver to the transmitter are not permissible. The frequeney of the transmitter must be changed in accordance with instructions called at an attendant.

A test transmitter as provided by the present invention does not require any manipulation other than erecting and energizing it and then nevertheless radiates a constant field intensity for the fundamental frequency and harmonics thereof.

To such end an amplifying tube is used and the anode current thereof is made to be saw-tooth-shaped. In order to achieve this the control frequency of the testing transmitter is conveyed to the amplifying tube at an amplitude which is sufficiently great, while also the grid condenser and the grid leak resistance of such amplifying tube are properly calculated. As a result, with a certain anode loading resistance there will be effective at the antenna condenser the fundamental wave and harmonics which are the more numerous the steeper the descending flanks of the saw teeth. The amplitude of the harmonics decreases when the ordinal thereof increases. Contrary to this phenomenon the radiation of a short bar-shaped antenna increases with the frequency increasing in its turn. Therefore, according to other features of the invention the amplitude, which decreases when the ordinal of the harmonics increase, is so balanced by properly tuning the antenna, that the antenna shall radiate a constant amplitude for the fundamental wave and a number of harmonics.

In the drawing, Fig. 1 is a diagrammatic view showing one embodiment of the invention, Fig. 2 is a graph of the anode current of tube 2, Fig. 1.

The arrangement illustrated in Fig. 1 is the customary control transmitter which also may be variable. 1 denotes the oscillatory tube, 2 the amplifying tube, R_G the grid leak resistance, C_1 the grid condenser for tube 2. According to the invention, R_G and C_1 are so chosen that the anode current JA of tube 2 is saw-tooth-shaped, as illustrated in Fig. 2. This anode current has the fundamental frequency of the control transmitter. With a certain anode resistance R_a, there are effective at the antenna condenser C_2 the fundamental wave and harmonics which are the more numerous the steeper the descending flanks of the saw teeth represented in Fig. 2.

If the antenna be $\lambda/4=2.5$ m long, λ being the wavelength, then its best efficiency is obtained in the case of $\lambda=10$ m. Furthermore, if the fundamental frequency of the control transmitter be 1 MHz, that is, one million cycles per second, it will be possible to insure a fairly constant field intensity of the test transmitter within a range that includes the 25th harmonic. The transmitter thus operates within the entire necessary frequency range, say from 100 m down to 10 m, at a field intensity which is constant for distances of 100 kHz, 500 kHz or 1000 kHz.

No attendance to such test transmitter is necessary during operation.

Transmitters of this kind are intended especially for testing the reception of short waves.

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