

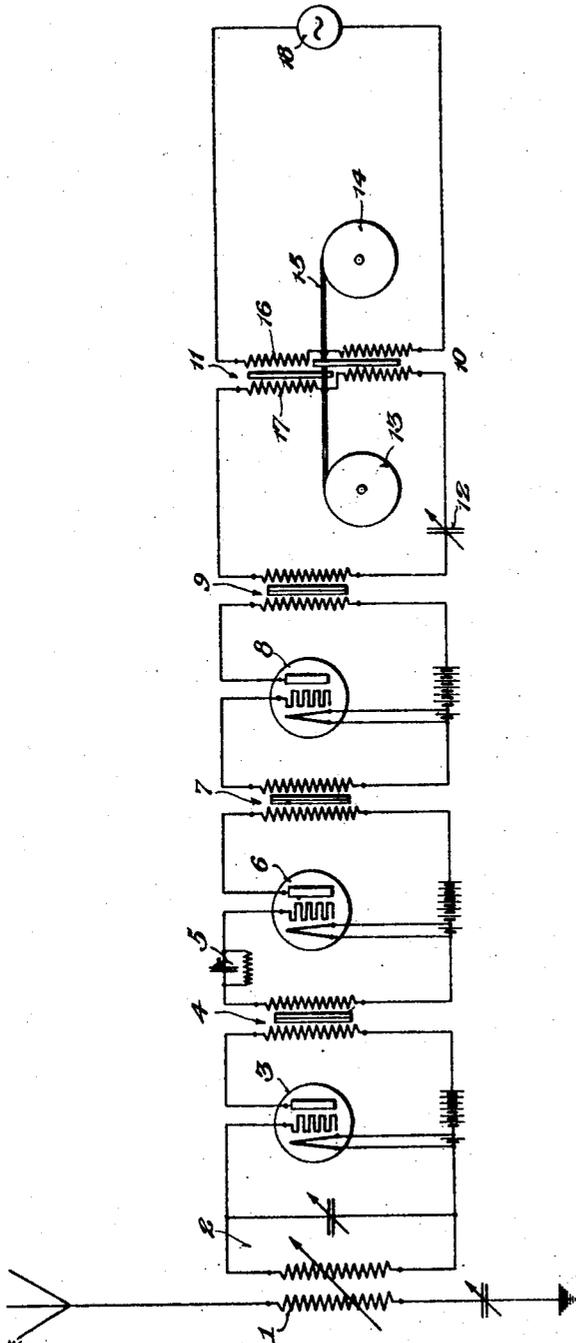
Aug. 30, 1927.

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1,640,881

RADIO TELEGRAPH SYSTEM

Filed March 26, 1921



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Patented Aug. 30, 1927.

1,640,881

UNITED STATES PATENT OFFICE.

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RADIO TELEGRAPH SYSTEM.

Application filed March 26, 1921. Serial No. 456,020.

Our invention relates broadly to signaling systems and more particularly to a reception system for radio telegraphy.

5 The object of our invention is to provide an improved method for receiving signals by aid of a telegraphone.

10 A further object of the invention is to provide a method of agitating the recording element of a telegraphone simultaneously with the recording of signals.

15 Heretofore when employing the telegraphone in the reception of signals it has been customary to excite the recording element with a magnetic field created by a source of direct current simultaneously with the reception of signals. The purpose of this exciting field (sometimes called the polarizing field) being to set the molecules of the magnetic recording element in motion thus sensitizing said recording element to be actuated simultaneously by the incoming signal. This may be termed overcoming the hysteresis effect of the steel wire, i. e., the recording element. When using high amplification objectionable noises are heard in the reproduction process due to the direct current excited magnetic field. These disturbances are caused from the unevenly magnetized steel wire and the vibration of the wire as it passes the reproducing signal heads.

25 In our improved exciting system which forms the subject matter of the present invention the advantages of the exciting system above described are obtained to a greater degree and without the disadvantages encountered in the reproducing process, i. e., objectionable noises. An alternating magnetic field of preferably high frequency is used in the exciting process.

30 It has been found when running a telegraphone at normal speed, that frequencies of 10,000 cycles per second and above are not recorded efficiently but that they have the effect of agitating the recording element so as to greatly increase the sensitiveness of said element to feeble signal impressions.

35 Our invention will be more clearly understood by reference to the following drawing wherein numeral 1 represents a tuned antenna circuit, 2, a tuned input circuit associated with the vacuum tube, 3, and coupled to the antenna circuit 1. The output circuit of the vacuum tube 3 actuates the input circuit of the vacuum tube, 6, by means

of a radio frequency transformer 4. Vacuum tube 6 is adjusted to operate as a detector tube and has the usual grid leak and condenser 5 inserted in the grid circuit. Audio frequency transformer 7 couples the output of vacuum tube 6 to the input of vacuum tube 8. The output of vacuum tube 8 is connected to the winding 17 of the signal head 11 on the telegraphone 10, through the audio frequency transformer 9 and variable condenser 12. The usual filament and plate batteries are associated with the vacuum tube circuits. The recording wire 15 of the telegraphone 10 passes thru the signal head 11 from reel 13 to 14. The reels are operated by electric motor drive. High frequency generator 18 energizes the exciting winding 16 of signal head 11. This generator may be for example, of the vacuum tube or alternator type. Windings 16 and 17 are wound on the same iron core.

The operation of the system is as follows: The incoming signal is selectively received, amplified and detected. The audio frequency of the incoming signal is impressed on the circuit 9, 12 and 17 which is tuned to the frequency of said audio frequency signal. A high frequency energizing current preferably above 10,000 cycles per second derived from source 18 constantly excites the winding 16. The recording steel wire 15 as it passes the pole pieces of the signal head 11 is agitated by the high frequency magnetic field created in the pole pieces by the winding 16. Under this agitation the wire 15 is sensitive to audio frequency magnetic changes superimposed on the high frequency magnetic field by the signal energy in the winding 17. An intense magnetic stress is created on the steel wire conforming with the signal energy and without leaving any trace of the high frequency exciting magnetic field on the wire.

Having thus described our invention what we claim is:

100 1. A telegraphic receiving system comprising in combination a signal receiving circuit, a generator of high frequency current, a movable wire recording element, a pair of magnetic core members located on opposite sides of said movable wire recording element, sets of independent windings each set comprising a pair of sections with one section disposed on each of said core members, one set of said windings being con-

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nected in said signal receiving circuit and the other set of said windings being connected with said high frequency generator.

2. A telegraphic receiving system comprising in combination a signal receiving circuit, a generator of high frequency current, a movable wire recording element, a pair of magnetic core members located on opposite sides of said movable wire recording element, a pair of windings carried by each of said core members and separately

connected in series, one set of said series connected windings being arranged in circuit with said signal receiving circuit, and the other set of said series connected windings being connected in series with said generator of high frequency current whereby said core members are simultaneously saturated by radio frequency and audio frequency magnetic fields.

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