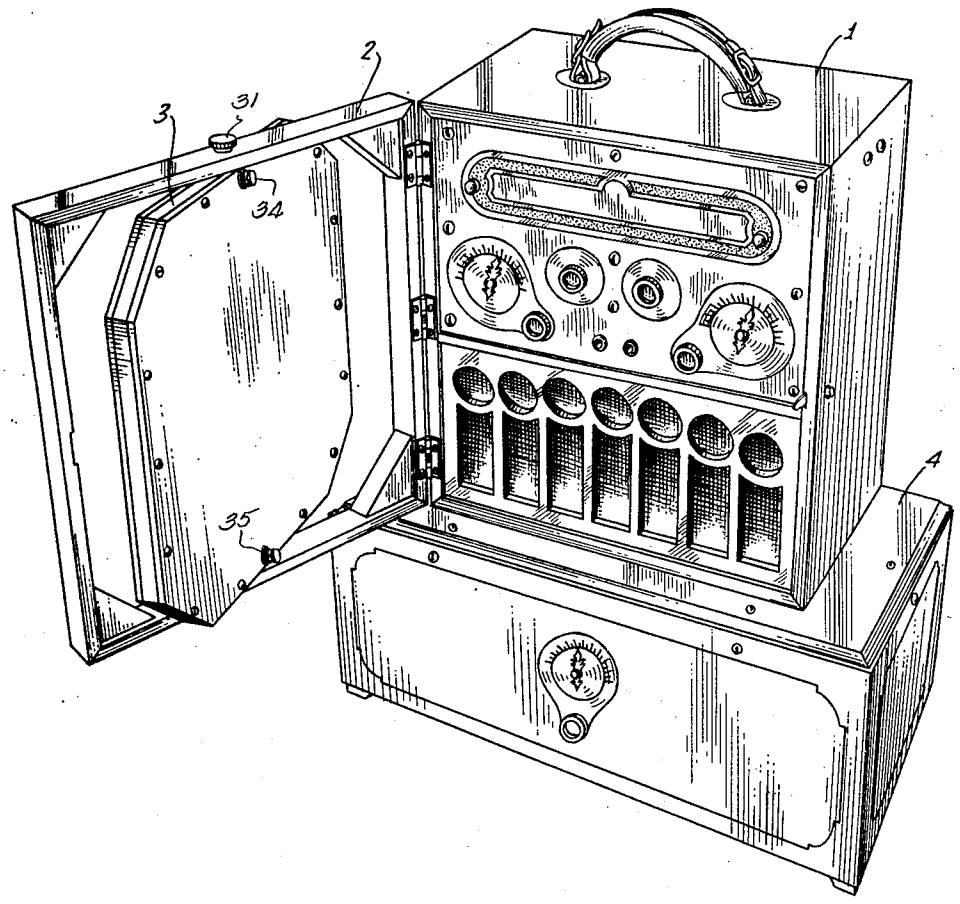
June 9, 1931. A. F. VAN DYCK 1,808,941

RADIO SYSTEM

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Fig. 1



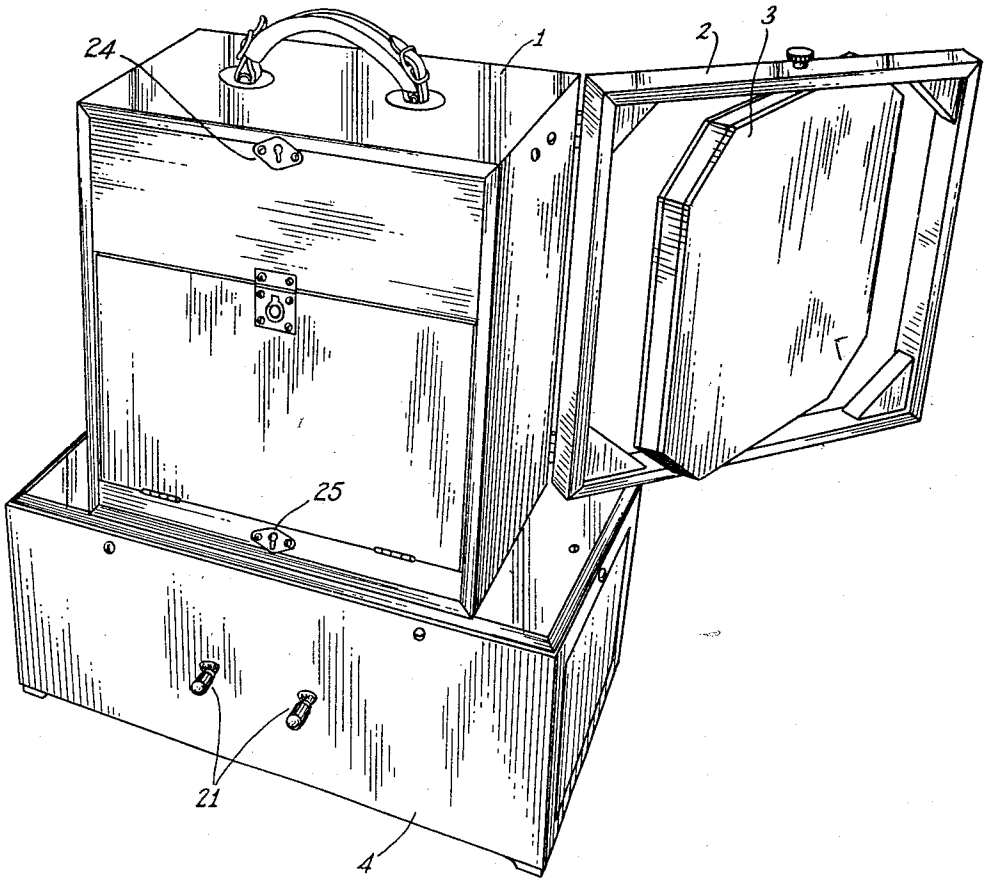
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RADIO SYSTEM

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Fig. 2



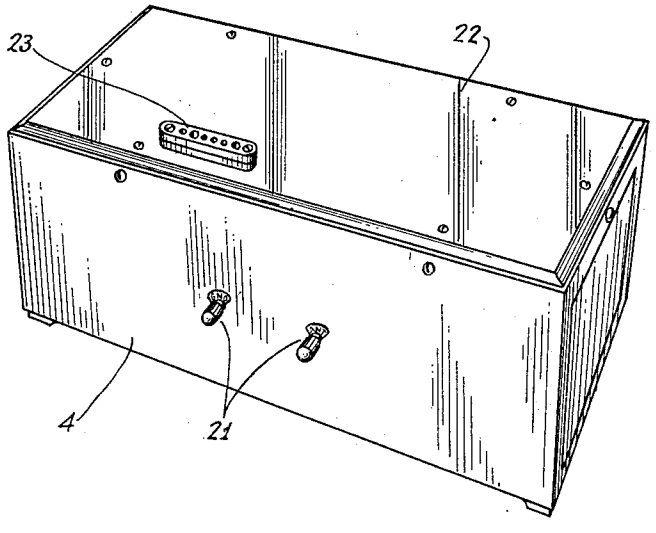


Fig. 3

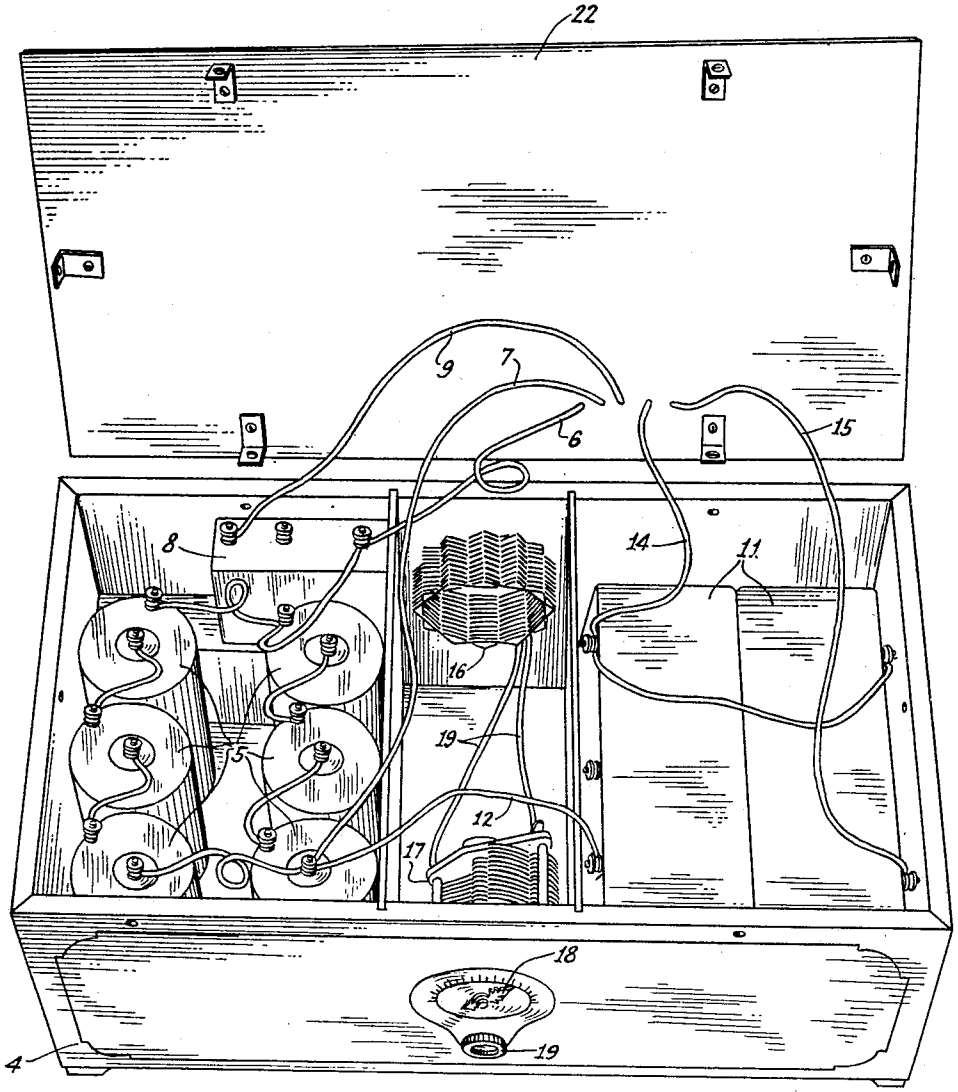
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Fig. 4



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UNITED STATES PATENT OFFICE

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RADIO SYSTEM

Application filed November 7, 1925. Serial No. 67,474.

My invention relates to radio receiving systems, and particularly to supplementary apparatus for combination therewith comprising non-portable current supply means therefor, and a resonant circuit coupled thereto.

An object of my invention is to provide, in combination, a portable radio receiving apparatus having contained current sources, with an alternative non-portable current supply source.

Another object of my invention is to provide, in combination, a portable radio system having a loop antenna, and a non-portable current supply therefor, with a cooperating serial and ground system.

Another object of my invention is to provide as a distinct part of a radio receiving system, a cabinet having therein current supply sources, a resonant circuit, and antenna and ground connection means.

Another object of my invention is to provide in combination a radio receiving system having a loop antenna with a non-portable cabinet containing current sources, and with a resonant circuit coupled to the loop antenna and adapted to be connected to an antenna and ground system.

Another object of my invention is to provide in combination, a portable radio receiving system and a non-portable cabinet having separate compartments, respectively containing high and low voltage batteries and a resonant circuit.

It has been found possible to design radio receiving devices, preferably of the super-heterodyne type, which will function with a small loop antenna and which are sufficiently compact, so that the circuits, receiving apparatus, translating device, and current supply sources may be mounted within a cabinet of such size and weight as to be conveniently portable. A typical apparatus of this kind embodies the super-heterodyne circuits, and triode vacuum tubes in such type and number as to be conveniently energized by the provided 1½ volt A batteries, a C battery and four 22½ volt B batteries. The requirement of portability, however, restricts both the number and size of the batteries incorporated in the apparatus and, therefore, frequent renewal of the batteries becomes necessary when the apparatus is in regular use.

Since a portable set is frequently used for substantial periods of time in a fixed location, it has been found desirable to provide alternative current source for connection with the apparatus when it is in use in such a fixed location, for the purpose of avoiding the drain upon the small sized batteries which are desirable in the portable case.

Also in certain instances, it has been found desirable to use the receiving system with an antenna and ground.

This may conveniently be done by the apparatus of my invention, which provides a convenient stationary cabinet, upon which the portable apparatus may be placed, which is divided into compartments adapted to house the fixed current sources, and also a resonant circuit which is adapted to be connected to the aerial and ground system and loosely coupled to the loop antenna of the receiving apparatus.

Other objects and structural details of my invention will be apparent from the following description when read in connection with the accompanying drawings, wherein:

Fig. 1 is a perspective view in front elevation of a portable radio apparatus in combination with a cabinet containing supplementary current supply means and a resonant circuit.

Fig. 2 is a perspective view in rear elevation of the same combination.

Fig. 3 is a perspective view in rear elevation of the container cabinet for the current sources and the resonant circuit, and

Fig. 4 is a view of the interior of the cabinet showing the current sources and the resonant circuit.

In Figure 1 a portable cabinet 1 contains the circuits, triodes, and apparatus of a radio receiving system which may preferably be of the super-heterodyne type. The cabinet 1 further contains small current supply sources and a "loud speaker" reproducer. The front of the cabinet and the controls are protected by the swinging frame 2 and antenna 3 as disclosed in my copending appli-

cation, Serial No. 57,339, filed September 19, 1925.

The frame 2 has pivoted therein the loop antenna structure 3 as described in the copending application. A non-portable cabinet 4 having a plurality of compartments is provided by my invention, as shown in the figures, upon which the cabinet 1 with its contained apparatus may be positioned.

The cabinet 4 contains, in its various compartments as shown in Figure 4, a plurality of 1½ volt "A" batteries 5 which are connected in series-parallel relation to leads 6 and 7, and a grid bias battery 8 which is connected to leads 6 and 9.

The cabinet 4 further contains in another compartment, a set of large size "B" batteries 11, which may be four in number, of 22½ volt pattern, or may be two of the 45 volt pattern. These batteries are connected in series and the negative terminal thereof is connected by a lead 12 to the batteries 5, and the lead 7. A mid point tap from the batteries 11 is connected to lead 14 and the positive terminal of the batteries 11 is connected to the lead 15.

An air-core inductance 16 is provided in a middle compartment as shown. A variable condenser 17 having an indicator 18 and a control knob 19 is provided within the same compartment and connected by leads 19 to the terminals of the inductance 16. Terminals 21 are provided upon the exterior rear side of the cabinet 4 as shown in Figures 2 and 3 and the leads 19 are connected to them.

The terminals 21 are adapted to be connected to a ground and aerial system. The circuit comprising the ground and aerial with the inductance 16 and the condenser 17 thus forms a resonant circuit which is adapted to be tuned to the various frequencies of the desired signals by movement of the variable condenser 17. When the cover 22 of the cabinet 4 is closed and the cabinet 1 containing the portable radio system is positioned thereon, electro-magnetic coupling occurs between the various conductors of the resonant circuit, and the loop 3 of the radio receiving apparatus. It is desirable that the loop 3 be positioned with its axis parallel to the axis of the coupling coil 16 within the cabinet 4 in order to obtain satisfactory electro-magnetic coupling therebetween. This may be obtained by swinging the door 2 and loop 3 to a convenient position or it may preferably be obtained by removing the loop 3 from the covering frame 2 by unscrewing pivot 31 and attaching it to contact members 24 and 25 by means of prongs 34, 35 which fit into the pear shaped holes in members 24, 25. These contact members complete the circuit to the detector system as described in the previously mentioned copending application. When so positioned closer and more satisfactory coupling between the antenna circuit and the loop is obtained. By this means signals, incident upon the aerial, may be transferred to the loop 3 and therefrom to the radio receiving circuits within the cabinet 1.

The leads 6, 7, 9, 14 and 15 are brought to the terminals of a connection block 23 which is adapted to enter a recess in the bottom of the cabinet 1 and to make connection with the circuits therein as shown and described in my copending application Serial No. 67,475, filed November 7, 1925.

By the device of my invention I provide a convenient combination comprising a cabinet, adapted to cooperate with a portable radio apparatus, and to contain non-portable current sources whereby the continuous drain of current from the small sized current source in the portable apparatus is avoided, and a resonant circuit which is adapted to be connected to an antenna and ground system, whereby additional signal energy is imparted to the receiving apparatus.

While I have shown but one embodiment of my invention in the foregoing drawings and description it is capable of various modifications therefrom without departing from the spirit thereof, and it is desired therefore that only such limitations shall be imposed thereon as are required by the prior art or indicated by the appended claims.

I claim as my invention:

1. A portable radio receiving apparatus and a non-portable cabinet adapted for supporting said portable radio receiving apparatus and containing a tunable circuit including a coil, a loop antenna removably supported on a frame, said frame in turn pivotally mounted on said receiving apparatus, and means on a side of said portable radio receiving apparatus and on said antenna for cooperatively supporting said antenna, when removed from the frame, in a position such that the axis of said loop antenna is substantially parallel to the axis of the coil in the tunable circuit.

2. In combination, a non-portable cabinet, a tunable resonant circuit including a coupling coil mounted in said cabinet, said circuit being adapted to be connected to a grounded antenna, a portable cabinet, a radio receiving circuit in said second cabinet, a removable loop antenna movably mounted on said second cabinet and connected to said receiving circuit, means provided on said second cabinet to receive said loop antenna when removed from said mounting, said last means being so disposed relative to said coupling coil that said tunable resonant circuit is coupled to said radio receiving circuit by said loop antenna.

3. In combination with a portable cabinet comprising a radio receiving circuit, and a loop antenna removably mounted on the cabinet, a non-portable, supporting cabinet containing means for operating said portable receiving circuit more efficiently, said last men-

tioned means including a tunable resonant circuit adapted to be connected to a grounded antenna, and means provided on the portable cabinet to receive the loop antenna when removed from said mounting, said last means being so disposed relative to the said tunable resonant circuit that the tunable circuit may be coupled to the portable receiving circuit by the loop antenna.

4. The combination with a portable cabinet including radio receiving apparatus, current supply means for energizing the receiving apparatus, and a loop antenna, of a relatively non-portable, supporting cabinet containing means for operating said radio receiving apparatus more efficiently, the last mentioned means consisting of a non-portable, relatively stronger current supply means adapted for connection to the receiving apparatus for energizing the latter in place of the portable current supply means, and means arranged in coupling relation with the loop antenna, when the portable cabinet is supported on the non-portable cabinet, for increasing the strength of signals impressed upon the radio receiving apparatus.

5. The combination with a portable cabinet including radio receiving apparatus, current supply means for energizing the receiving apparatus, and a loop antenna, of a relatively non-portable, supporting cabinet containing means for operating said radio receiving apparatus more efficiently, the last mentioned means consisting of a non-portable, relatively stronger current supply means adapted for connection to the receiving apparatus for energizing the latter in place of the portable current supply means and a tunable resonant circuit arranged in coupling relation with the loop antenna, when the portable cabinet is supported on the non-portable cabinet, for increasing the strength of signals impressed upon the radio receiving apparatus.

6. In combination, a portable cabinet including radio receiving apparatus, a portable current supply for energizing said receiving apparatus, and a removable loop antenna, a non-portable supporting cabinet containing means for operating said portable apparatus more efficiently, said last means consisting of a non-portable, relatively stronger current supply adapted for connection to said receiving apparatus for energizing the latter in place of the portable supply in said portable cabinet to avoid the drain on the relatively weaker portable current supply, a tunable resonant circuit adapted to be connected to a grounded antenna, and means on the portable cabinet for positioning the loop antenna to couple the said tunable resonant circuit and portable receiving apparatus when the non-portable current supply is connected to the said receiving apparatus.

ARTHUR F. VAN DYCK.