Dec. 20, 1949 A. NICOLE 2,491,873

WIRELESS RECEIVER

Filed April 17, 1945 2 Sheets-Sheet 1

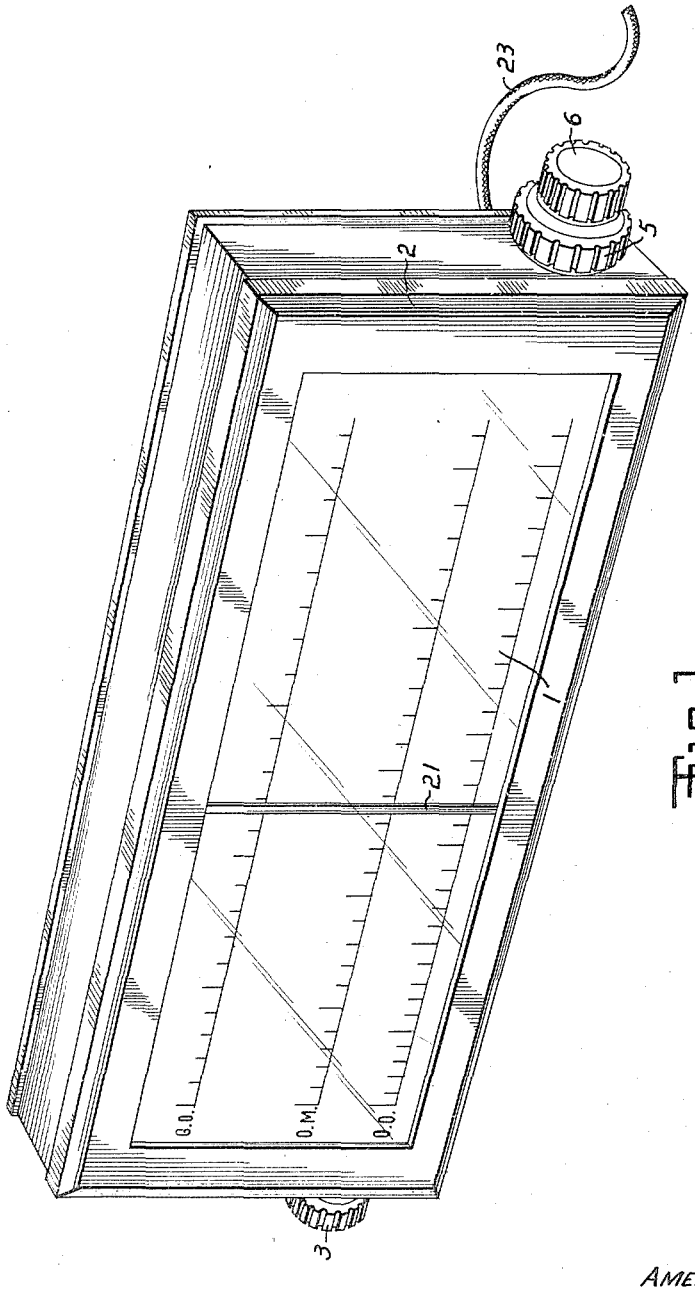

Fig. 1.

INVENTOR
AMEDEE NICOLE

BY Young, Emery & Thompson
ATTORNEYS

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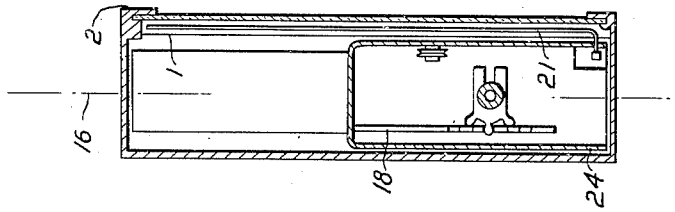

Fig. 4.

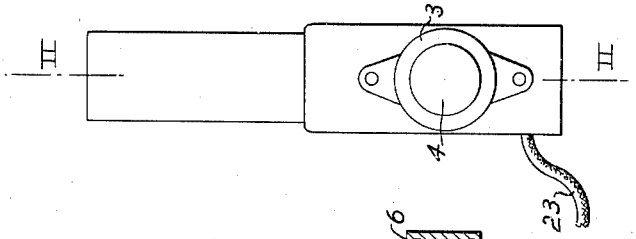

Fig. 3.

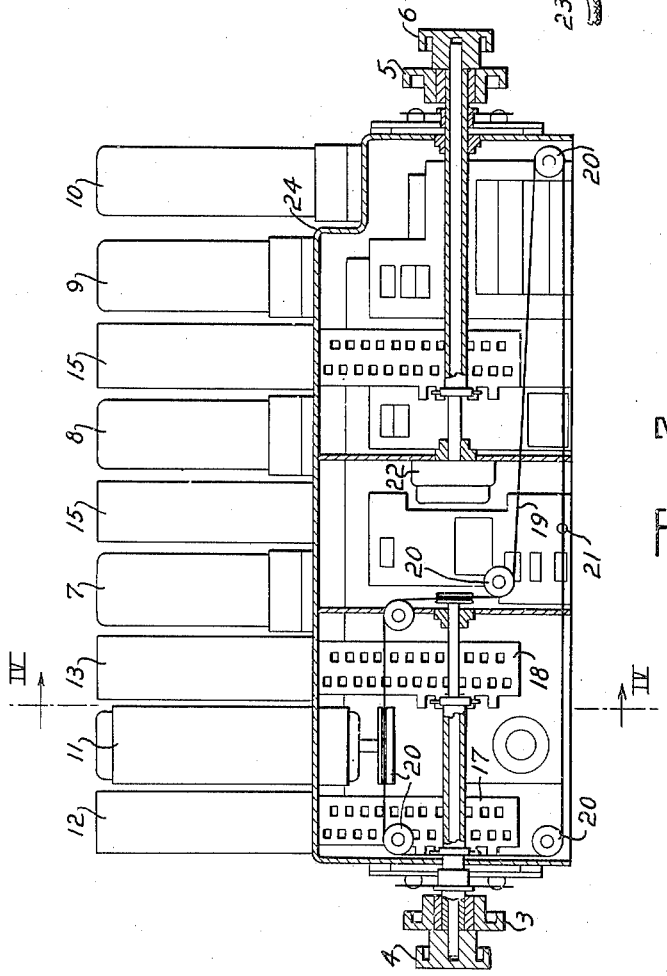

Fig. 2.

INVENTOR
AMEDEE NICOLE
BY Young, Berney & Thompson
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,491,873

WIRELESS RECEIVER

Amédée Nicole, Ste.-Croix, Switzerland, assignor, by mesne assignments, to Hermann Thorens S. A., a corporation of Switzerland

Application April 17, 1945, Serial No. 588,764
In Switzerland July 21, 1944

2 Claims. (Cl. 250—14)

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There are available a multitude of receivers for broadcast radio-waves. They include generally a chassis, carrying the members of the various amplifier-circuits, a dial and a loudspeaker, the whole mounted in a housing or in a cabinet of wood. Considering the dimensions of the loudspeaker, which it is necessary to provide for obtaining good musical reproduction, this housing or cabinet has of necessity relatively great dimensions. As a consequence thereof, the designers have a tendency to give this housing the shape of a more or less ornamented piece of furniture. In fact however, these receivers require a considerable space and it would therefore seem desirable to decrease their dimensions without prejudice to the quality of the reproduction of the receiver.

The loudspeaker being furthermore placed of necessity at a near distance from the tuning-circuits, there takes place a reaction between the loudspeaker and these circuits, reaction which produces a coupling effect called "acoustic coupling." This coupling effect makes it impossible to utilize fully the power of amplification of the amplifier.

The object of the present invention is a receiver for broadcast-waves, which consists of a dial and at least a part of the amplifying circuits necessary for feeding the loudspeaker, such an arrangement reducing the inconveniences mentioned, by the fact, that at least the part of the receiver carrying the tuning-circuits is separated from the loudspeaker and that all essential parts of the amplifier-circuits of the said part of the receiver are located in the same plane parallel to any one of the generating straight lines in the surface-plane of the dial.

The drawing attached shows schematically and as a matter of example two forms of execution of the receiver.

Fig. 1 is a perspective view of the receiver.

Fig. 2 shows a longitudinal cross-section along plane II—II of Figure 3.

Fig. 3 is a side view and Fig. 4 a cross-section in the plane IV—IV of the Figure 2.

In the form of execution as shown in Figures 1 to 4, the receiver comprises, as is the case in most of today's receivers, a mixing tube 7, a medium-frequency tube 8, a low-frequency pre-amplification tube 9 and an output-tube 10.

The receiver has the shape of a parallelepipedon, one face of which contains the dial 1. This dial is enclosed by a frame 2, the dimensions of which determine two of the dimensions of the parallelepipedon. The third dimension of the

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latter is small compared with the two first mentioned and corresponds approximately to the thickness of the dial plus the diameter of an electronic tube.

The knobs 3, 4, 5, 6 for operating the tuning devices are arranged on the two smallest faces of the parallelepipedon. From the rear-face (opposite to the dial) emerges a flexible cable 23, containing the conductors necessary for connecting the receiver to the loudspeaker and to the supply-system.

Figures 2 and 3 show the disposition of the essential circuits of the receiver, viz. the electronic tubes 7, 8, 9, 10, the variable condensers 11, the tuning coils 12, the coils of the oscillator-circuit 13 and the coupling-transformers 15. All of these organs are arranged side by side in the same plane 16, parallel to the plane of the dial 1 and occupy approximately half of the volume of the parallelepipedon. The other half of this volume is taken up by the mechanical transmission members connecting the knobs with the members of the oscillating-circuits, for selection at will the desired station, and further by the resistances, by condensers, by connections and by other small members of fixed characteristics, necessary for the good functioning of the receiver.

Knob 3 controls simultaneously the two commutator-switches 17 and 18, one of which cuts in or out the different sections of the tuning coils 12, whereas the other switch controls the cutting in or out of the various sections of the coils 13 of the oscillator-circuit. By means of a cable 19 passing over small pulleys 20, the knob 4 controls the displacements of the variable condenser 11 and of an index-pointer 21, travelling along the graduated scales on the dial 1. The knob 5 operates a commutator-switch, for modifying the characteristic frequency-curve of the low frequency stages. It permits thus of choosing and fixing the tonality of the receiver. Lastly, the knob 6 controls a device 22, for choosing and fixing the output-volume desired. This knob permits also of cutting in or off of the supply-system of the receiver.

As will be noted, the overall-dimensions of the receiver described above are much smaller than the ones of the chassis of a receiver of the same output and of a known type. The receiver described does not require any luxurious and expensive housing, since one of its faces is entirely or nearly entirely occupied by the dial. As a matter of fact, the dimensions of the front-face of the parallelepipedon are determined by the dimen-

sions of the dial, viz. by the precision of readability and regulation desired. The small dimensions of the receiver permit it to be incorporated for example in a table or another piece of furniture. It may also be simply placed on a table and maintained in a slightly inclined position by a suitable support. It may also be very easily transported from one place to another.

The loudspeaker, the dimensions of which cannot be reduced if quality reception should be conserved, may be placed at a hidden place as for example in a cupboard or behind a panelling. In such a case, baffles or a resonance-box may be provided in order to profit of all the qualities of the loudspeaker and receiver, a condition which it is not possible to obtain with receivers of the actual design and which combine receiver and loudspeaker in the same housing. Since the loudspeaker is at great distance from the tuning circuits of the receiver, there cannot possibly occur any reaction between the same and for this reason, no "acoustic coupling" is to be feared, even when tuning the circuits very closely to their points of resonance, in order to take advantage of all the amplifying power of the set.

It is evident, that the receiver described above may have different forms of execution. It is particularly possible to add or to omit other amplifier-stages. It is also evident, that the superheterodyne receiver described above as a matter of example, may be replaced by any other type of receiver. Lastly, if it is desired to still more reduce the overall-dimensions to a minimum, there may be mounted behind the dial only the high-frequency and medium-frequency stage or stages, which are equipped with tuning-circuits. The low-frequency stage or stages and the rectifier may be placed in a housing, near the loudspeaker.

For principal reasons, the rectifier, which is a relatively heavy piece of apparatus, due to the large volume of iron of its transformer, should of preference not be incorporated in the receiver, but should be placed somewhere outside, as for example near the loudspeaker or any other place desired. However, in the case of there being employed electronic tubes, supplied directly with the voltage of the supply-system, the rectifier may also be mounted behind the dial, inside of the housing enclosing the receiver.

In the form of execution as shown in Figures 1 to 4, the members of the amplifier-circuits are mounted on a chassis 24, which in turn is fixed by any known means to either the dial or to the walls of the parallelepipedon. As an alternative form of execution, it would however be possible to omit the chassis and to fix these organs directly to either the dial or its frame, or to the walls of the parallelepipedon.

It is evident, that the dial may be arranged in different manners, with respect to the amplifier-stages, provided that the essential members of the amplifier-stages near the dial be located in one plane and that this plane be parallel to any one of the straight lines contained in the surface of the said dial.

I claim:

1. A radio broadcast receiver for feeding a remotely located loudspeaker comprising a parallelepipedon cabinet having a dial forming one side wall thereof, a plurality of electronic tubes mounted in alignment with their axes lying in a plane spaced from but parallel to said dial, a plurality of elements including transformers, condensers, variable condensers, tuning coils and oscillator coils in the plane of said electronic tubes, a plurality of adjusting devices positioned in proximity to said elements and having movable elements, the movable elements of said variable condensers, tuning coils and adjusting devices having axes of rotation or translation lying substantially in said plane, and control members coupled to said movable elements and projecting through end walls of said cabinet, all of said elements and adjusting devices having a thickness approximating the diameter of said tubes, and the distance between the dial and the opposite wall of said cabinet being substantially equal to the external diameter of one of said electronic tubes.

2. A radio broadcast receiver for feeding a remotely located loudspeaker comprising a parallelepipedon cabinet having long narrow top and bottom walls, long high front and rear walls each having an area considerably greater than that of the other walls and cooperating end walls, said front wall being formed substantially entirely of a dial, a plurality of electronic tubes mounted in alignment with their axes lying in a plane spaced from but parallel to said dial, a plurality of elements including transformers, condensers, variable condensers, tuning coils and oscillator coils in the plane of said electronic tubes, a plurality of adjusting devices positioned in proximity to said elements and having movable elements, the movable elements of said variable condensers, tuning coils and adjusting devices having axes of rotation or translation lying substantially in said plane, and control members coupled to said movable elements and projecting through end walls of said cabinet, all of said elements and adjusting devices having a thickness approximating the diameter of said tubes, and the distance between the dial and the opposite wall of said cabinet being substantially equal to the external diameter of one of said electronic tubes.

A. NICOLE.

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