Nov. 20, 1956 R. MONTMEAT 2,771,559

PORTABLE CLOCK RADIO

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Fig. 1.

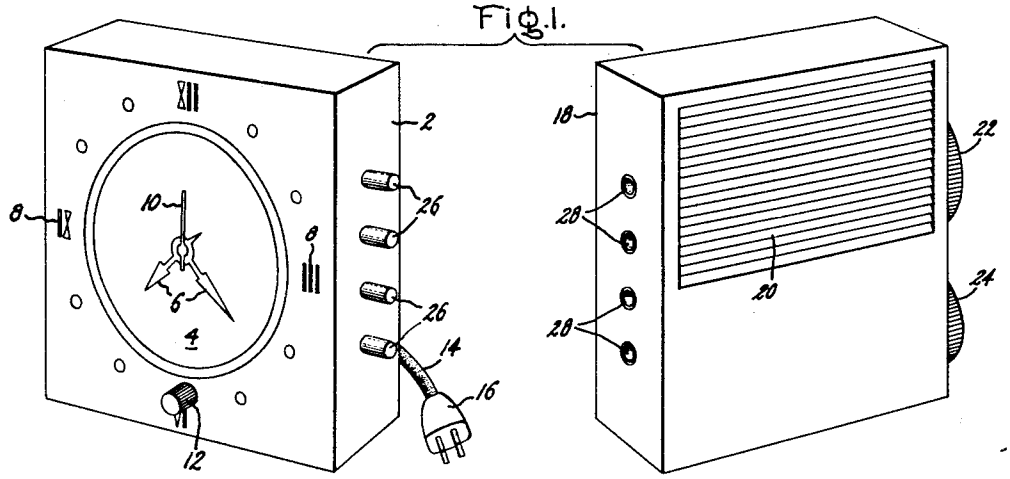
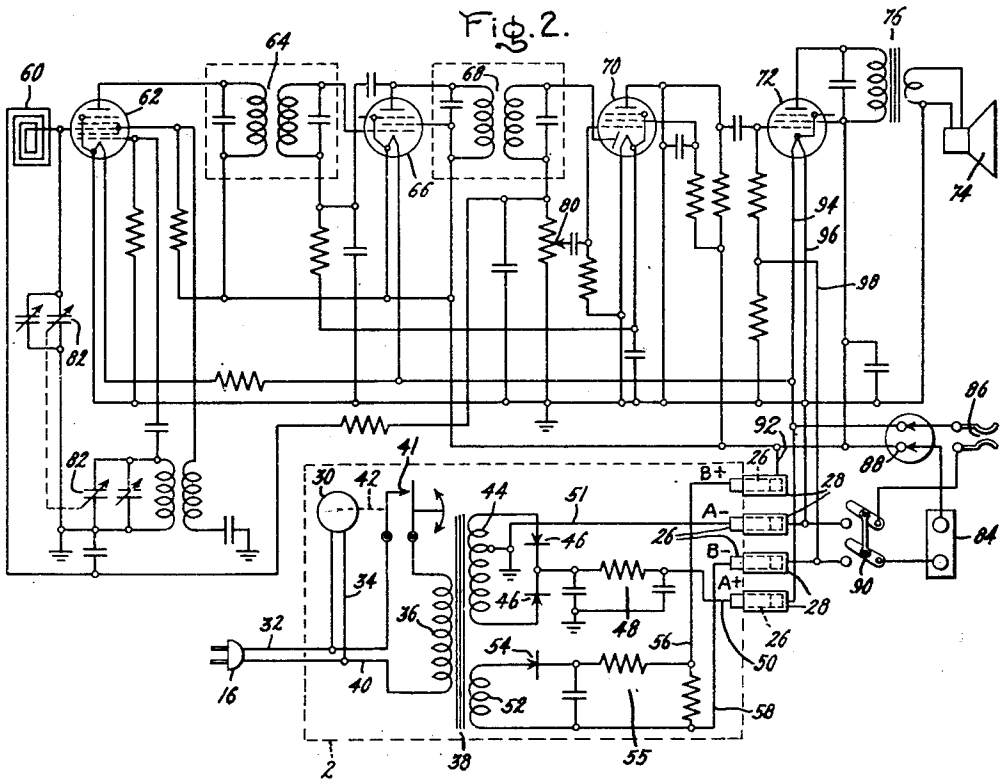


Fig. 2.



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PORTABLE CLOCK RADIO

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7 Claims. (Cl. 307—156)

This invention relates to a novel clock-receiver combination in which a clock and power-supply are provided in one self-contained unit and in which a battery powered receiver is provided in a second self-contained unit.

There are numerous clock-receiver combinations in the prior art and offered to the consuming public. These devices usually include a receiver, an A.-C. power supply and a clock timing mechanism in a single unit. An on-off switch is provided which is mechanically coupled to the clock to be actuated thereby. The clock receiver combinations provided in the prior art are single units in which one element has no utility apart from that of the other. In the modern usage of receivers, particularly radio receivers, the so-called "portable" receiver has wide recognition. This unit is sometimes constructed to be used in a semi-permanent installation by providing both a battery power-supply and an A.-C. power-supply, either one of which may be used selectively. Both of these power supplies require space and add weight to the device. Thus, the user of such a receiver is required, when he is using his receiver as a portable receiver operating on the battery power supply, to carry with him structure with its accompanying weight and space requirements which are of no immediate value to him.

It is, therefore, an object of this invention to provide a novel clock-receiver combination in which a clock and receiver are mounted in separate self-contained units.

It is another object of this invention to provide a novel clock-receiver combination in which a clock and power-supply are provided in one self-contained unit which may be readily connected to a separate receiver-unit whereby operating potentials may be supplied to the receiver at predetermined times.

It is still another object of this invention to provide a novel clock-receiver combination in which the receiver is in a separate self-contained unit which may be detached from the clock-unit and includes only that power-supply necessary to enable it to operate as a portable receiver.

Briefly, the objects of this invention are achieved in one form by the provision of a first housing structure in which a clock and power-supply device are mounted. The power-supply device rectifys the standard A.-C. line voltage to provide the necessary operating potentials for a receiver. A switch is provided in the power supply device and is mechanically coupled to the clock in such a manner that it may be closed either at the discretion of the operator or at predetermined time to activate the power-supply device. A second housing structure has a complete "home" receiver mounted therein and also includes a battery power-supply. The two housing structures are provided with cooperating means so that they may be selectively attached to one another at the discretion of the operator. A means is provided to couple the output of the power-supply device to the receiver unit when the two housings are connected. Included also, is a switch device to selectively couple the output of the power-supply device or the battery power-supply to the receiver. This arrangement affords the user a clock, a

clock-receiver or a compact, lightweight portable receiver as desired.

The features of my invention which I believe to be novel are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing, in which:

Figure 1 is an exploded front view of clock-receiver combination embodying my invention; and

Figure 2 is a schematic illustration of the components housed in the units forming a part of my invention.

In Figure 1, I show a first housing or clock unit **2**. Mounted in the clock unit **2** is an electrically driven clock mechanism (not shown) which is associated with a dial **4** appearing in the front of the housing **2** and drives a pair of time indicating hands **6**. Also provided on the front of the housing or elsewhere, as selected by a designer, are suitable time marking indicia **8**. An alarm setting hand **10** is provided on the dial face **4** and is positioned by rotating a control knob (not shown) which may provide either on the front or the rear of the clock, unit **2**. A control knob **12** is mounted on a shaft (not shown) extending to the front of the clock unit **2** and is connected to a switch structure (to be described in greater detail hereinafter) in any manner well known in the art. A suitable cord **14** and plug device **16** are provided whereby the A.-C. potential to drive the clock and to furnish receiver operating potentials may be obtained from the standard wall electrical outlet.

Still referring to Figure 1, there may be seen a second housing or receiver unit **18**, which includes a suitable louvered opening **20** which furnishes an outlet for a loudspeaker mounted therebehind. A first control knob **22** may be mounted on one side of the housing **18** on a shaft (not shown) extending therethrough and used to actuate a broadcast station selector means in a receiver device mounted in the housing. A second control knob **24** may also be shaft mounted on a side of the housing **18** and used to control the "on-off" and volume of the receiver in the housing. The knobs **22** and **24** and their respective shafts are connected to their respective elements (described in greater detail hereinafter) in any manner well known in the art.

In the utilization of the clock-receiver combination, the operator has several modes of operation available to him. The clock-unit **2** may be energized by connecting the plug **16** to a suitable electrical outlet. The alarm setting control knob (not shown) may be rotated to cause the actuation of an alarm means at predetermined times. When it is desired to have the units function as a clock-receiver combination the clock-unit **2** is attached to the receiver-unit **18** by inserting the plug connectors **26** extending from the clock-unit into the receptacles **28** provided in the receiver-unit **18**. The plug connectors **26** and the receptacles **28** are dimensioned so that there is a frictioned force therebetween which holds the two units in an assembled position and are suitably insulated so that there is no danger of electrical shock to the user. (An alternative means for coupling the unit **2** to the unit **18** and for performing other functions is disclosed in the copending application of Lyle P. Creiman, Serial No. 561,195, filed January 25, 1956, which is assigned to the same assignee as the present invention.) When the units **2** and **18** are so connected, the receiver in unit **18** is in a position to have its necessary operating potentials coupled thereto. These potentials may be supplied at predetermined times according to the setting of the alarm setting hand **10** or as desired by the operator.

Another alternative use of invention is available by the provision of the separate self-contained receiver-unit **18** and its battery power-supply. When the two units are

disconnected, the receiver-unit is a light weight, compact "portable." The particular advantage of low weight and compactness, as compared to the constructions known in the art, is obtained by virtue of the fact that a power-supply device for furnishing receiver operating potentials from an A.-C. source is not included in the unit 18 when its use is not needed.

Referring now to Figure 2 of the drawing, there will be seen a schematic illustration of a circuit which may be used in a clock-receiver combination embodying my invention. The clock-unit 2 houses an electric clock mechanism 30 which is energized by a potential furnished via the conductors 32 and 34 from the plug 16. A primary 36 of a power-supply transformer 38 which transformer is also mounted in the clock unit 2 is connected in parallel with the clock 30 and has a potential applied thereto via the conductors 32 and 40. Serially connected in the circuit of the transformer primary 36 is a switch device 41 which is mechanically connected as shown by the dotted line 42 to the electric clock 30. The switch device 41 may be one, any one of those well known in the art which is adapted to be closed either at predetermined times according to the setting of the setting hand 10 or as desired by the operator by rotating the control knob 12 in the proper direction.

A first secondary 44 of the transformer 38 provides a voltage which after detection by a full wave rectifier 46 is filtered by a network 48 is supplied as a standard "A+" voltage for the receiver unit. A first conductor 50 couples the output, the filter network 48 to one of the plugs 26 which serves as an "A−" connection. A second conductor 51 is coupled to another of the plugs 26 and serves to return the "A−" voltage to ground. Also, provided on the transformer 38 is a second winding 52, the output of which is rectified by the unidirectional conducting device 54 and filtered by a network 55 to provide the standard "B+" operating potential for a radio receiver. Conductor 56 coupled between the output of the filter network 56 and one of the plugs 26 provided by a path whereby the "B+" voltage may be supplied to the receiver in the unit 18 while the conductor 58 provides a return path for this voltage.

Also shown in Figure 2 is the schematic illustration of a radio receiver capable of use in a clock-receiver combination incorporating my invention. It is obvious that other receiver designs are capable of use in this combination and the illustrated design is shown by way of example only.

The receiver includes an antenna 60, the output of which is coupled to an oscillator-convertor stage 62. An I. F. transformer 64 couples the output of the oscillator-convertor 62 to an I. F. amplifier stage 66. The amplified I. F. signal is coupled via a second I. F. transformer 68 to a combination detecting and audio amplifying stage 70. A power amplifier 72 receives the output of the amplifier 70 and drives a loudspeaker 74 through a transformer 76. A volume control potentiometer 80 is included amplifying portion of the detector amplifier 70 in order that the output of the receiver may be controlled. Tuning of the receiver is accomplished by means of ganged capacitors in the R. F. input circuit and in the local oscillator circuit as shown at 82.

When it is desired to operate the receiver as a battery powered "portable," the receiver-unit 18 is manually disconnected from the clock-unit 2 and its power-supply. Operating potentials for this mode of use are obtained from a "B" battery 84 and an "A" battery (not shown) inserted between a pair of spring contacts 86. A switch device 88 controls the flow of the potentials from the batteries and may be ganged with the volume control potentiometer 80 to be actuated by the second control knob 24.

In order to use this combination embodying my invention as either a clock-receiver or as a home receiver, the

clock-unit 2 is joined to the receiver-unit 18 by inserting the plugs 26 into the receptacles 28. A switch such as shown at 90 may be provided to open the circuit from the battery power-supply so that the receiver operating potentials are derived solely from the power-supply in the clock-unit 2. When the units 2 and 18 are so connected, the "B+" potential is coupled via the conductor 56, plug 26 and receptacle 28 and the conductor 92 to be applied to the plates of the receiver's tubes in a manner well known in the art. The "A+" potential is furnished to the receiver via the conductor 50, plug 26 and receptacle 28 and a conductor 94. In the same manner the "A−" return is coupled back to the clock-unit 2 power-supply via the conductor 96 to one of the receptacles 28 and the "B−" return is coupled via a conductor 98 to another of the receptacles 28.

When it is desired to use the two units as a clock-receiver, they are joined by inserting the plugs 26 into the receptacles 28 or by any other suitable means. The control knob 12 may be rotated to either an "automatic" position or to an "on" position. In the former position, the receiver will be energized at a predetermined time according to the setting of the hand 10. In the latter position, the receiver-unit 18 will be energized at once in the manner of the standard "home" receiver.

From the above-description it may be seen that my invention affords a wide variety in the use of clock-receivers. That is, the combination provides a clock, a clock-receiver, a "home" receiver and a light weight compact "portable" receiver.

While the invention has been described by reference to a particular embodiment thereof, it will be understood that numerous modifications may be made by those skilled in the art without departing from the invention. I therefore aim in the appended claims to cover all such equivalent variations as come within the true spirit and scope of my invention.

What I claim as new and desire by Letters Patent of the United States is:

1. A clock-receiver combination comprising: a self-contained clock-unit including a clock, a power-supply, switch means associated with said power-supply to determine its operation, means connecting said clock to said switch to close said switch at predetermined times; a self-contained receiver-unit including a receiver and a battery power-supply; and means for selectively furnishing operating potentials to said receiver from either said clock-unit power-supply or said battery power-supply.

2. A clock-receiver combination comprising a self-contained clock-unit including a clock, a power-supply, switch means associated with said power-supply to determine its operation, and means connecting said clock to said switch to activate it at predetermined times; a self-contained receiver-unit including a receiver and a battery power-supply; means for selectively attaching said clock-unit to said receiver-unit, means coupling the output of said clock-unit power-supply to said receiver-unit, and means for selectively furnishing operating potentials from either said clock-unit power-supply or said battery power-supply.

3. A clock-receiver comprising a first housing, an electric clock mechanism mounted in said first housing, a power-supply device mounted in said first housing for furnishing at least two receiver operating potentials, switch means associated with said power-supply device and connected with said electric clock mechanism whereby potential may be coupled to said power-supply device at predetermined times, a second housing, a receiver mounted in said second housing and means in said first and second housings whereby they may be connected to each other and for coupling said receiver operating potentials from said power supply device to said receiver.

4. A clock-receiver comprising a self-contained clock-unit, an electric clock mounted in said clock-unit, means in said clock-unit for furnishing receiver operating po-

tentials, a switch electrically connected to said means and mechanically connected to said clock for operating said means either at predetermined times or manually, a self-contained receiver unit including a receiver and a battery power-supply, means whereby said clock-unit and said receiver-unit may be selectively connected to each other and means whereby operating potentials may be supplied to said receiver from either said means in said clock-unit or said battery power-supply.

5. A clock receiver combination comprising a self-contained clock-unit including a clock, a power-supply, switch means associated with said power-supply to determine its operation, means connecting said clock to said switch to close said switch at predetermined times; a self-contained receiver-unit including a receiver and circuitry adapted to furnish receiver operating potentials from a battery power supply to said receivers, and means for selectively joining said clock-unit to said receiver-unit and furnishing operating potentials from said clock-unit power-supply to said receiver.

6. A receiver combination comprising a first housing, a power-supply mounted in said first housing for developing receiver operating potentials, switch means associated with said power-supply to determine its operation, a second housing, a receiver mounted in said second housing, circuitry provided in said second housing adapted to furnish receiver operating potentials from a battery power-supply, said means for selectively joining said first housing to said second housing and for coupling said receiver operating potentials developed by said power-supply to said receiver.

7. A clock-receiver combination comprising: a first housing, an electric clock mounted in said first housing, a power-supply device mounted in said first housing and adapted to develop operating potentials for a receiver, conductors coupling potentials to said clock and to said power-supply device, a switch interposed in a conductor leading to said power-supply device, said switch being connected to said clock whereby said clock may actuate said switch at predetermined times and permit operation of said power-supply device; a second housing, a receiver mounted in said second housing, a circuit in said second housing adapted to furnish operating potentials for said receiver from a battery power-supply or from said power-supply device; and cooperating means on said first and said second housings whereby they may be selectively joined to one another and the receiver operating potentials from said power-supply device may be coupled to said circuit.

No references cited.