Aug. 1, 1950 DON CARLOS WISELEY 2,517,368

ALARM FOR HEARING AID USERS

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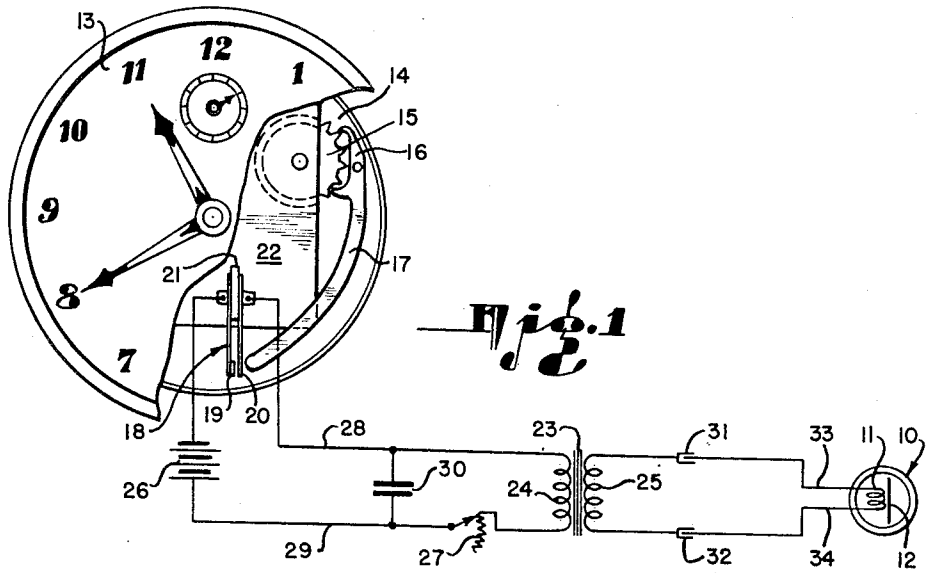


Fig. 1

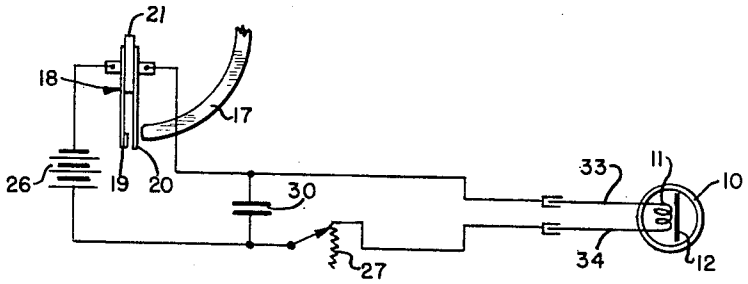


Fig. 2

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ALARM FOR HEARING AID USERS

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9 Claims. (Cl. 161—22)

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My invention relates to a simple and effective alarm for persons whose hearing is such that they cannot hear ordinary alarms, such as the alarms of alarm clocks, and relates to an alarm for deaf persons which uses, or may be used in conjunction with, speakers of the character ordinarily provided with electrical hearing aids.

Ordinary alarm means which are found effective for the awakening of persons with normal hearing, I have found inadequate for deaf persons. Therefore, the deaf person who is without someone else to awaken him, is at a real disadvantage with respect to the matter of being awakened from slumber at desired times. It is an object of the present invention to provide a simple alarm which may be used with the speaker of a hearing aid, this speaker being worn by a person during slumber.

It is an object of the invention to provide an alarm having a speaker with a diaphragm element and electrical means to move the diaphragm element, combined with an alarm clock and means controlled by the alarm clock which will produce electrical impulses in the circuit of the speaker.

It is the further object of the invention to provide a simple alarm mechanism for use with a hearing aid speaker, this device comprising means arranged to be employed with an alarm clock having an alarm control or alarm mechanism, the device comprising switch contacts which are intermittently closed by the alarm mechanism so as to produce impulses in a circuit and to produce electrical impulses in the coil or other electro-responsive part of the hearing aid speaker.

Further objects and advantages of the invention will be brought out in the following part of the specification wherein I have described preferred embodiments of the invention in detail for the purpose of presenting a complete disclosure, without limiting the scope of the invention defined by the appended claims.

Referring to the drawings which are for illustrative purposes only:

Fig. 1 is a schematic view of a preferred form of the invention, and

Fig. 2 is a diagram showing an alternative form in which the principles of the invention may be practiced.

In Fig. 1, I schematically show a hearing aid speaker 10. This speaker 10 has electro-responsive means for producing sound vibrations. As one form of such electro-responsive means I have shown in the speaker 10 an electro magnetic

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winding or coil 11 and a diaphragm 12 which is moved by magnetic flux produced when the coil 11 is energized. This speaker 10 is worn adjacent or in the meatus of the external ear so that any sound produced by movement of the diaphragm 12 is carried directly to the auditory organ.

The invention includes, or is used in conjunction with a clock 13 having a time controlled alarm mechanism 14 comprising an escapement including the toothed wheel 15 and a pivotally supported yoke 16 disposed so as to be reciprocated by the teeth of the wheel 15 when this wheel is rotated. An arm or lever 17 projects from the yoke and is reciprocated by the yoke 16 during the time the alarm mechanism is in operation. That is to say, when the escapement wheel 15 is being rotated. When the alarm is inactive, or in other words when the tooth wheel 15 is not in rotation, the lever 17 is movable back and forth within a limited distance which may be referred to herein as the non-operating range of movement of the lever. However, when the toothed wheel is being driven, so that it will act continuously upon the yoke 16, the lever 17 will swing back and forth through a greater arc or range, referred to herein as the operating range of movement of the lever 17.

A switch 18 is provided consisting of spring contacts 19 and 20 and a supporting member 21 of insulating material for attaching the switch 18 to a portion 22 of the clock, in such position that the lower end of the lever 17 will intermittently close the contacts 19 and 20 when the lever 17 is reciprocated by rotation of the toothed wheel 15 and is therefore being actuated so as to reciprocate in its operating range of movement or outside its non-operating range of movement. The switch 18 is positioned, for example, with its contact 20 adjacent the lower end of the lever 17. When rotation of the toothed wheel 15 reciprocates the lever 17 the lower end thereof will strike the contact 20 and intermittently move it into engagement with the contact 19.

In the form of the invention shown in Fig. 1, I employ a transformer 23 having a primary winding 24 and a secondary winding 25. The switch 18, when actuated, opens and closes a circuit which includes the contacts 19 and 20, the winding 24, a battery 26 and a variable impedance 27 disclosed as a rheostat. The circuit is formed by suitable conductors 28 and 29, and a condenser 30 is bridged across the circuit.

The secondary winding 25 of the transformer

23 has the ends thereof connected to connectors 31 and 32 to which the lead conductors 33 and 34 of the speaker 10 are detachably connected. Each time engagement of the contacts 19 and 20 produces an electrical flow through the winding 29, a current impulse is induced in the winding 25 and is conducted through the coil 11 of the speaker 10 producing a sound impulse which, though not harsh, is of distinctive character and readily awakens the wearer of the speaker 10. The sound impulses have a frequency corresponding to the rate of oscillation of the lever 17 by the toothed wheel 15. The rheostat 27 provides a means whereby the intensity of the sound produced in the speaker 10 may be regulated to suit the desires or needs of the user.

In Fig. 2, I show an alarm system, similar in its general character to that which has been shown in Fig. 1, but avoiding the use of the transformer 23. The switch 18 is disposed so as to be actuated by time controlled means such as the lever 17. This switch may be connected directly in series with the coil 11 of the hearing aid speaker 10.

I claim as my invention:

1. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled escapement operative to reciprocate said lever, said lever having an operating range of movement and a non-operating range of movement: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in said position that said lever, moving outside its non-operating range of movement, will effect opening and closing of said contacts; a battery; a transformer having a primary winding and a secondary winding; a variable impedance; a circuit including said contacts, said battery, said impedance and said primary winding in series; a condenser bridged across said circuit; and means for connecting said secondary winding of said transformer to said hearing aid speaker.

2. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled drive means to reciprocate said lever: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said lever, when reciprocated by said drive means, will effect opening and closing of said contacts; a battery; a transformer having a primary winding and a secondary winding; a circuit including said contacts, said battery and said primary winding in series; and means for connecting said secondary winding of said transformer to said hearing aid speaker.

3. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled escapement operative to reciprocate said lever, said lever having an operating range of movement and a non-operating range of movement: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said lever, moving outside its non-operating range of movement, will effect opening and closing of said contacts; means forming a circuit comprising said contacts, a battery and a variable impedance; and means for effecting electrical energization of said speaker from current flow in said circuit.

4. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled drive means to reciprocate said lever: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said lever, when reciprocated by said drive means, will effect opening and closing of said contacts; means forming a circuit comprising said contacts, a battery; and means for effecting electrical energization of said speaker from current flow of said circuit.

5. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled alarm actuating mechanism: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said alarm actuating mechanism, when in operation, will effect opening and closing of said contacts; a battery; a transformer having a primary winding and a secondary winding; a variable impedance; a circuit including said contacts, said battery, said impedance and said primary winding in series; and means for connecting said secondary winding of said transformer to said hearing aid speaker.

6. In an alarm means for a hearing aid speaker, said alarm means being arranged for combination with a clock having an alarm lever and time-controlled alarm actuating mechanism: a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said alarm actuating mechanism, when in operation, will effect opening and closing of said contacts; means forming a circuit comprising said contacts, a battery; and means for effecting electrical energization of said speaker from current flow in said circuit.

7. In an alarm means for a hearing aid speaker: a clock having an alarm lever and time-controlled escapement operative to reciprocate said lever, said lever having an operating range of movement and a non-operating range of movement; a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said lever, moving outside its non-operating range of movement, will effect opening and closing of said contacts; a battery; a transformer having a primary winding and a secondary winding; a variable impedance; a circuit including said contacts, said battery, said impedance and said primary winding in series; a condenser bridged across said circuit; and means for connecting said secondary winding of said transformer to said hearing aid speaker.

8. In an alarm means for a hearing aid speaker: a clock having an alarm lever and time-controlled alarm actuating mechanism; a switch comprising contacts and an insulated support to secure said contacts to a portion of the structure of the clock in such position that said alarm actuating mechanism, when in operation, will effect opening and closing of said contacts; means forming a circuit comprising said contacts, a battery; and means for effecting electrical energization of said speaker from current flow in said circuit.

9. In an alarm means for a hearing aid speaker: a clock having a time controlled alarm mechanism; conductor means forming a circuit

connected to said hearing aid speaker; and means controlled by said alarm mechanism, when in operation, said last named means being adapted to produce electrical impulses in said circuit to in turn produce sound impulses in said speaker.

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