June 3, 1952 R. A. GOUGEON 2,598,994

ELECTROMAGNETICALLY OPERATED SIGNAL PRODUCING RESONATOR DEVICE

Filed July 28, 1949

Fig. 1

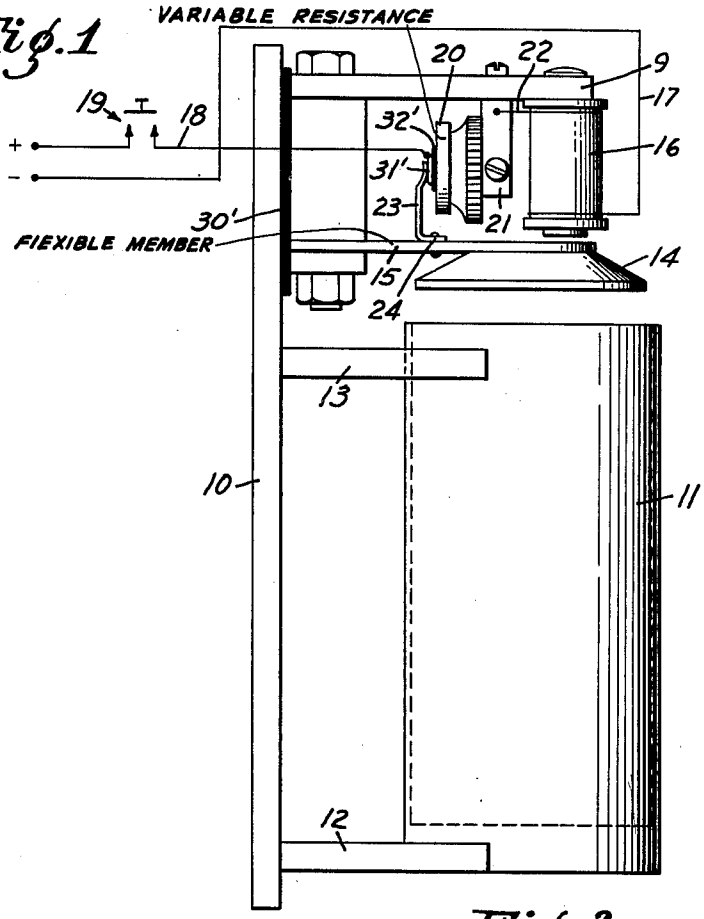


Fig. 3

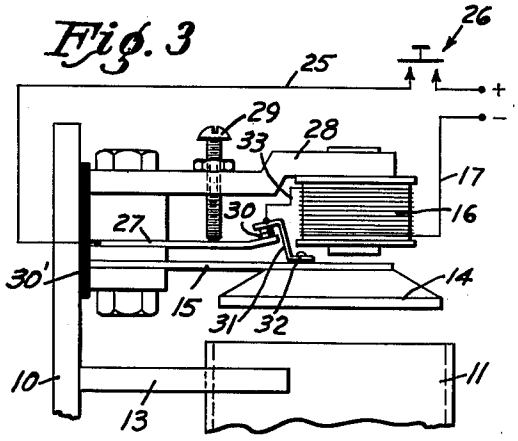
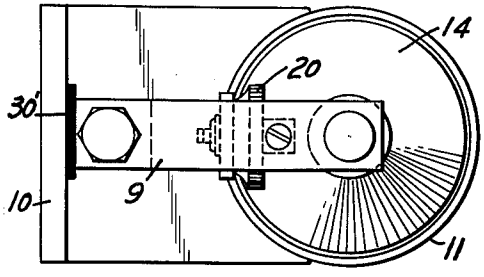


Fig. 2



INVENTOR.
RUSSELL A. GOUGEON,
BY Wilfred L. Lawson
ATTORNEY.

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ELECTROMAGNETICALLY OPERATED SIGNAL PRODUCING RESONATOR DEVICE

Russell A. Gougeon, Altadena, Calif.

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1 Claim. (Cl. 177—7)

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This invention relates to an audible signal device, and it is an object of the invention to provide a device of this kind wherein the signal tone produced is continuous in volume and pleasing to the ear.

It is also an object of the invention to provide a signal device free of the sound of percussion and wherein the means for creating tone or sound is inaudible.

Another object of the invention is to provide a signal device which provides a pleasant signal or tone, the tone being continuous in volume as long as energy is being supplied.

Still another object of the invention is to provide a signal device wherein the tone of a chime, bell, or the like is generated without the initial percussion sound that is customarily associated with bells which are mechanically struck.

Still another object of the invention is to provide a signal device wherein pleasing tones of a volume greater than that produced by conventional percussion chimes may be produced to satisfy commercial users.

A further object of the invention is to provide a signal device which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a view in side elevation of a signal device constructed in accordance with an embodiment of the invention;

Figure 2 is a view in top plan of Figure 1, with the wiring omitted; and

Figure 3 is a fragmentary view in side elevation of another embodiment of the invention.

Referring in detail to the Figures 1 and 2 of the drawings, there is shown a signal device which includes a support member 10 that serves to support a resonator tube 11, there being a pair of brackets 12 and 13 projecting from the member 10 for supporting the resonator tube 11. The tube or cylinder 11 is merely a reverberation chamber that determines the pitch. A suitable rubber gasket or insulator 30' is interposed between the tone generating mechanism and the support member 10. Mounted for movement toward and away from the resonator tube 11 is a body member 14 whereby the movement of the body member 14 towards and away from the resonator tube 11 results in a continuous or intermittent note or sound being generated. The

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body member 14 is secured to the free end of a flexible or resilient metal reed 15, which is part of the tone generating mechanism, and has sufficient weight to slightly bow the reed in a downward direction to increase the pressure of the arm 23 and, consequently, the current flow to the electro-magnet 16, due to the weakening of the current passing through the variable resistance 20 which occurs when the weight of the body overcomes the pull of the electro-magnet.

Mounted adjacent the body member 14 is an electro-magnet 16 which is supported by a bracket 9. A line or cable 17 electrically connects the electro-magnet 16 to a suitable source of electrical energy. A line or cable 18, having a manually operable switch 19 interposed therein, connects a carbon granule and button assembly or interrupter 20 to the source of electrical energy. The variable resistance is in the form of a granule and button assembly 20, which, preferably, is conventional and is similar to the modulator used in conventional telephones. Arranged in engagement with the granule and button assembly 20 is a contact 21 which is electrically connected to the electro-magnet 16 by line 22. Secured to the reed 15 by a rivet 24 is an arm 23 which has an end bearing against a contact 31' to thereby translate pressure to carbon granules within the assembly 20, when placed under tension by the downward movement of the reed 15 and the body 14. An insulator 32' is positioned between the contact 31' and the granule assembly 20.

In use, the switch 19 is actuated to thereby actuate or energize the electro-magnet 16. As the electro-magnet 16 is energized, the body member 14 is drawn or pulled away from the resonator tube 11, since the flexible reed 15 is attracted to the electro-magnet 16. Then, as the reed 15 flexes upwardly, the pressure on the carbon granules in the assembly 20 by the arm 23 is decreased and as this occurs the electrical circuit feeding to the electro-magnet 16 is weakened. Finally, the flow of current to the electro-magnet 16 weakens to the extent that the reed 15 springs downwardly as the result of the weight of the body member 14. The movement of the reed 15 downwardly again increases the pressure on the carbon granules and the electrical current flowing through the electro-magnet 16 becomes strengthened so that the cycle repeats itself. The current flowing through the electro-magnet 16 is never fully interrupted, but is merely weakened and strengthened by the action of the pressure of the arm 23 against the carbon

granules. Thus, an especially pleasant tone is generated, since the carbon granules permit a flow of electrical energy in direct proportion to the natural vibrations of the reed assembly. It is also to be noted that soft tones are readily generated because the device will operate on a much weaker electrical current than one depending upon the opening and closing of contact points. Since the arm 23 never bangs against the contact 31, there will be no audible noise or sparking produced. As the body member 14 is continuously moving toward and away from the resonator tube 11, a continuous or intermittent note or sound of a predetermined pitch will be generated.

In the device of Figures 1 and 2, the volume is limited by the natural action of the carbon granule modulator 20. Therefore, for installations requiring high volume, the reed is provided with a means for mechanically making and breaking the contact point as described later in this application. In the embodiment shown in Figure 3, the tone volume being generated is sufficient to drown out or render inaudible the mechanical sounds produced by the contact points. Thus, referring in detail to Figure 3 of the drawings, there is shown a slightly modified signal device. In the assembly of Figure 3, the numeral 10 again designates a support member which serves to support the resonator tube 11. A flexible metal reed 15 carries the body member 14 which coacts with the resonator tube 11 to produce the audible signal.

The assembly of Figure 3 further includes the electro-magnet 16 which is connected to a source of electrical energy by a line or cable 17.

A line or cable 25, having a switch 26 interposed therein, connects a contact bar 27 to the source of electrical energy. A set screw 29 projects through a bracket 28 and by properly rotating the set screw 29, the position of the contact bar 27 can be adjusted as desired. The contact bar 27 has a button 30 secured to its free end, and mounted for movement into and out of engagement or contact with the button 30 is an arm 31. The arm 31 has one of its ends secured to the flexible metal reed 15 by a rivet 32. A line or cable electrically connects the arm 31 to the electro-magnet 16, this line being designated by the numeral 33.

In using the device shown in Figure 3, the switch 26 is actuated to thereby complete the circuit to the electro-magnet 16 and energize the latter. As the electro-magnet 16 is energized, the reed 15 is flexed or moved toward the electromagnet 16, the reed 15 carrying the body member 14 therewith. When the reed 15 moves towards the electro-magnet 16, the arm 31 is moved out of engagement with the button 30 to thereby

open the electrical circuit leading to the electromagnet 16. Then, the weight of the body member 14 causes the reed 15 to flex downwardly away from the electro-magnet 16 and towards the reasonator tube 11. When the reed 15 has flexed sufficiently, the arm 31 will again be moved into engagement with the button 30 to thereby again complete the circuit leading to the electromagnet 16 so that again the reed 15 will be attracted to the electro-magnet 16. This continuous movement of the body member 14 towards and away from the resonator tube 11 will result in a generation of a continuous or intermittent note or sound of a predetermined pitch. The device shown in Figure 3 is adapted to be used in installations which require high volume.

From the foregoing, it is apparent that a signal device has been provided which will generate a pleasant signal or tone, the tone being continuous in volume as long as energy is being provided. Further, the tone is produced without the sound of percussion and the signal is adapted to be used for domestic or commercial purposes. The tone produced by the signal device of the present invention should be readily heard by a listener having defective hearing.

What I claim:

In a signal device, a support member, a resonator tube spaced from said support member and supported by the latter, a flexible metal reed, a relatively heavy body member carried by said reed and mounted for movement toward and away from said tube for producing an audible signal, an electro-magnet electrically connected to a source of electrical energy for moving said reed and the body member in one direction, a variable resistance electrically connected to said electromagnet, a line connecting said resistance to a source of electrical energy, and an arm carried by said reed for causing a variation in the flow of current through said resistance and the electromagnet when the weight of said body member overcomes the pull of the latter, which current variation results in the vibration of said reed and the body member carried thereby.

RUSSELL A. GOUGEON.

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