

United States Patent

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[56]

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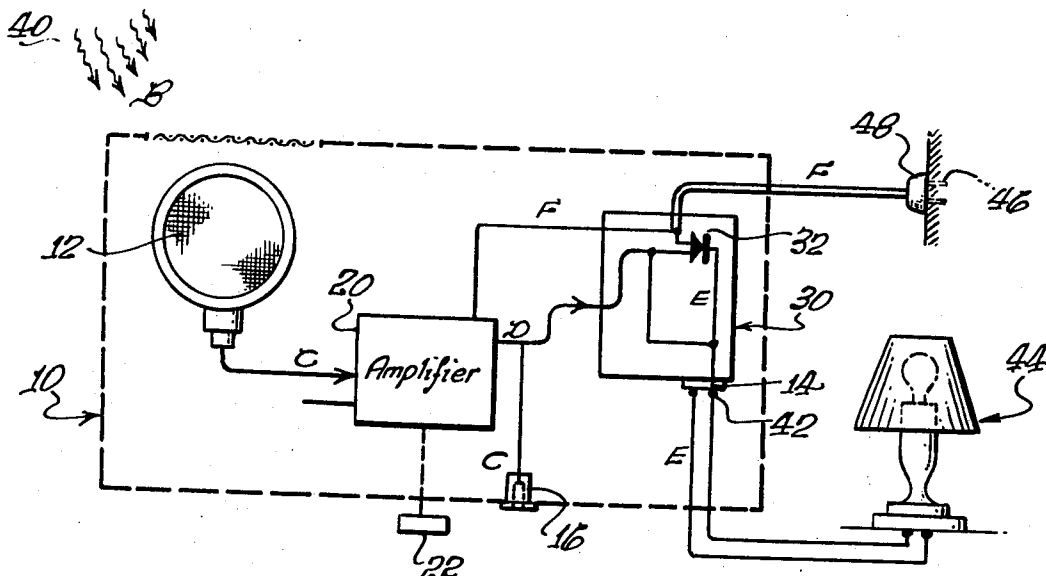
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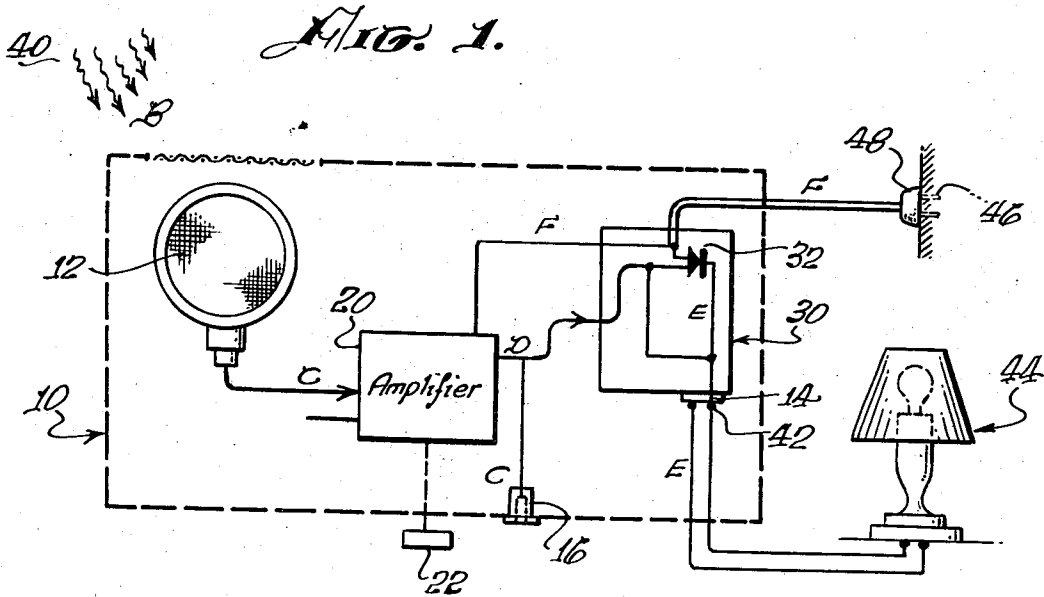
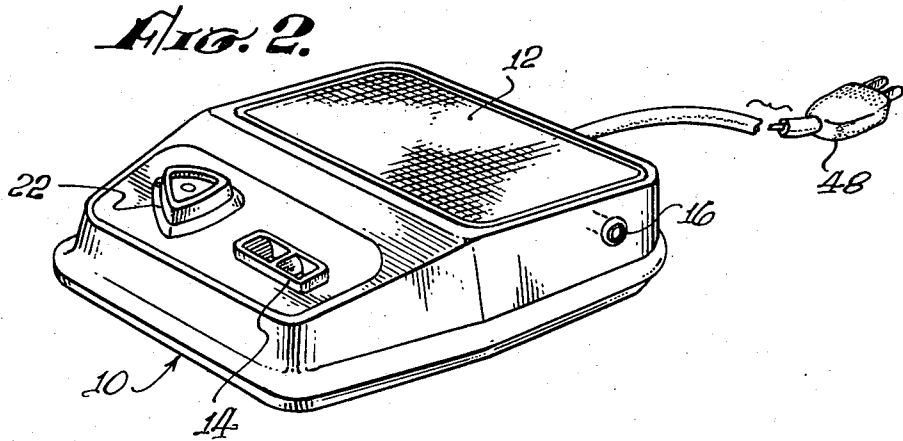
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[54] **MUSIC RESPONSIVE LIGHT POWER CURRENT
SWITCHING DEVICE**
10 Claims, 2 Drawing Figs.

[52] U.S. Cl. 340/148,
340/261, 340/331
[51] Int. Cl. G08b 5/22
[50] Field of Search 340/148,
261, 331

ABSTRACT: A music responsive light switching device comprising a music signal pickup which is connected to a control means which regulates the output of a power signal. The regulated power signal is applied to an electrical socket receptacle into which a conventional lamp is electrically plugged. The lamp can then be turned on and off in accordance with the characteristic rhythm of the music.





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MUSIC RESPONSIVE LIGHT POWER CURRENT SWITCHING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to electronic switching devices and more particularly to an apparatus which is responsive to the amplitude of electrical or music signals.

2. Description of the Prior Art

The prior art utilizes mechanical means to complete an electrical circuit which will energize a load. For example, U.S. Pat. No. 2,401,955 issued to H. F. Olson, et al., uses a vibratory conductive reed having point contacts. Devices responsive to acoustical energy (e.g., diaphragm, reed, or other vibratory means) are physically displaced by the sound wave, and their movement switches the loaded circuit either on or off. The contacts, once closed, transmit energy at constant power levels. Such devices are generally in unrelated arts and do not involve the same system as disclosed herein. To the extent relevant, such prior art devices are incapable of switching a light source on and off in rhythm to the music. "Off" as used herein includes dimming. To accomplish such a function there have been some attempts at frequency sensitive circuits which involve elaborate, expensive, and cumbersome devices. These devices have been entirely inconsistent with use in the home.

SUMMARY OF THE INVENTION

An electronic switching device operates to turn a conventional lamp on and off or to alter the intensity of the lamp in accordance with a characteristic of the music.

The unit comprises the combination of a music pickup which is connected to an amplifier which in turn is connected to a switching means. The switching means includes a silicon-controlled rectifier which is coupled both to a wall socket for input power and to a receptacle adapted for receiving a plug from a conventional lamp. With sensitivity controls set at predetermined levels, the sound of the music will be picked up, and upon receipt of an electrical sound signal above a particular level the switching means will allow electrical energy to flow to the light socket receptacle and turn the lamp on. The electrical energy output is responsive to the amplitude which in much of modern music is related to the beat or rhythm of the music. For example, it has been discovered that in modern type dance music, such as rock and roll, frug, jerk, etc., the loudest sound is usually that of the basic rhythm or beat. The switching means being responsive to the amplitude of the music causes the lamp to pulsate in the same rhythm as the music. The lamp is not necessarily extinguished as the amplitude varies, hence, the switching device gives a dimming effect rather than a blinking effect. This dimming effect responding to the music amplitude is commonly referred to as a psychedelic lighting effect.

The device is especially suitable for teenage dance parties, in the home, at dance halls, gymnasiums or recreation centers. The lamp may be a conventional home lamp, Christmas tree lamps, or lamps in a toy such as those in a doll's head. The electronic switching device can be powered by either an AC or DC source. It can be made more or less sophisticated by adding or subtracting amplifiers or transistors. It can also be utilized to receive a sound wave from an orchestra, singer, or any musical instrument, or it can take an electrical sound signal directly from an audio amplifier speaker output terminal.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 shows a block diagram of the basic components which comprise the unit; and

FIG. 2 is a perspective view of the assembled unit as it would appear to a customer.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A music signal B radiated from a speaker 40 (e.g., phonograph, tape recorder, etc.) is received by the music pickup 12. The music pickup 12 may be a microphone which converts the acoustical energy B into electrical energy C. The electrical music signal C is conducted to an audio amplifier 20. After predetermined amplification, the amplified electrical music signal D is conducted to the switching means 30. The switching means 30 is responsive to an electrical sound signal D having a predetermined level. When the level desired is reached, the switching means 30 allows an electrical power signal E to pass to an electrical socket receptacle 14. A plug 42 from a conventional lamp 44 is mated to the electrical socket receptacle 14 on the electronic switching unit 10. The power supply F for the amplifier 20 and the switching means 30 may be provided by standard AC power conducted through wall plug 48 from a conventional wall outlet 46. A sensitivity control switch 22 controls the amplification of the electrical music signal C. It is within the scope of the invention to use a DC power source and to include the lamp 44 as part of the unit. Such arrangements may be particularly useful for dancing, or other dolls, or toys.

The basic component in the switching means 30 is a solid-state switching device 32. The solid-state switching device 32 permits an electrical power signal E of varying strength to be conducted to the electrical socket receptacle 14. It should be noted that the solid-state switching device is particularly well suited to this function as it is capable of controlling substantial power as required by a lamp, Christmas tree lamp, or lawn lamps.

In operation, the unit of FIG. 2 (approximately $4\frac{1}{2}'' \times 6'' \times 1\frac{1}{2}''$) which contains the entire system, with the exception of the lamp and music source is placed in proximity of a music source. The plug 48 is connected to the wall outlet 46 and the lamp plug 42 is mated to the electrical socket receptacle 14. When the radiated signal B is received by the pickup 12, it is conducted to the amplifier 20 which is set at a pre-selected value. Amplifier 20 provides predetermined level of gain as controlled by the sensitivity control switch 22. The solid-state switching device 32 being responsive or controlled by the amplified electrical music signal D allows a power signal E to pass to the electrical socket receptacle 14 which turns the light 44 on. As the strength of the sound signal B varies, i.e., as the amplitude of the music signal varies, usually according to the rhythm or beat of the music, the solid-state switching device 32 permits a greater or a less amount of the electrical power signal E to be passed to the electrical socket receptacle 14. Since the electrical power signal E conducted to the electrical socket 14 is not constant, it has the effect of varying the intensity of the light 44. Thus, the light brightens and dims in accordance with the beat or rhythm of the music B.

In another embodiment the electrical sound signal C may also be picked off directly from a phonograph terminal outlet connected to the phonograph amplifier to a switching device 10 through a jack box 16. This eliminates pickup 12 and amplifier 20. A hum network (not shown) may be used to prevent interference with the radio receiver or audio amplifier from which the electrical sound signal C is taken. With a stereo system such an arrangement provides a low-cost two-channel two-lamp system.

From the above description it is apparent that a substantially solid-state device of an extremely simple nature has been provided which is capable of controlling a lamp in accordance with the beat of a musical signal. The device may be miniaturized and employed in many low-cost applications. It has long life and high reliability.

Although this invention has been disclosed and illustrated with reference to particular applications, the principles involved are susceptible of numerous other applications which will be apparent to persons skilled in the art. The invention is, therefore, to be limited only as indicated by the scope of the appended claims.

We claim.

1. A music responsive light switching apparatus comprising:
an electrical socket receptacle for receiving a lamp plug;
first means for providing an electrical music signal related
to a music signal; and,
electronic control means for providing an electrical power
signal of varying strength, said electronic control means
coupled to said first means, said electronic control means
coupled to an electrical power source, said electronic
control means coupled to said electrical socket recepta-
cle, said electronic control means responsive to a charac-
teristic of said electrical music signal to vary accordingly
the strength of said electrical power signal conducted to
said electrical socket receptacle.
2. In a music responsive light switching apparatus as defined
in claim 1 wherein said first means includes a microphone and
amplifier.
3. In a music responsive light switching apparatus as defined
in claim 1 wherein said first means is a phonograph cartridge
coupled to an amplifier.
4. In a music responsive light switching apparatus defined in
claim 3 wherein said amplifier is a phonograph amplifier.
5. In a music responsive light switching apparatus as defined
in claim 1 wherein said electronic control means is comprised
of an electronic switching means, said electronic switching
means being responsive to said electrical music signal when
said signal is at a predetermined level.
6. In a music responsive light switching apparatus set forth

in claim 2 wherein said amplifier is comprised of solid state
components.

7. In a music responsive light switching apparatus set forth
in claim 2 wherein said electrical power source is provided by
a plug connected to a standard household AC power supply.
8. The structure recited in claim 5 including a lamp con-
nected to said receptacle and a source of music.
9. In a music responsive light switching apparatus set forth
in claim 5 including a DC power source.
10. A music responsive light switching apparatus compris-
ing:
an electrical socket receptacle for receiving a lamp plug;
a microphone to receive a music signal and provide an elec-
trical music signal related thereto;
a solid-state amplifier coupled to said microphone, said am-
plifier having means operable to control the output of an
amplified electrical music signal related to said electrical
music signal, said amplifier having an AC power source;
and,
an electronic switching device coupled to said amplifier and
said electrical socket receptacle, said electronic switching
device having an AC power source, said electronic
switching device comprised of a silicon-controlled rectifi-
er, said rectifier responsive to said amplified electrical
music signal at predetermined levels whereby said rectifi-
er being responsive to a characteristic of said music signal
varies accordingly the strength of the electrical power
signal to said electrical socket receptacle.