

June 24, 1969

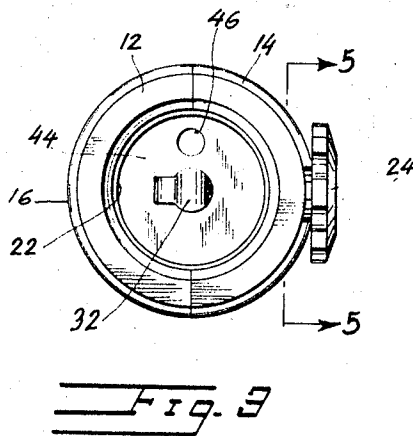
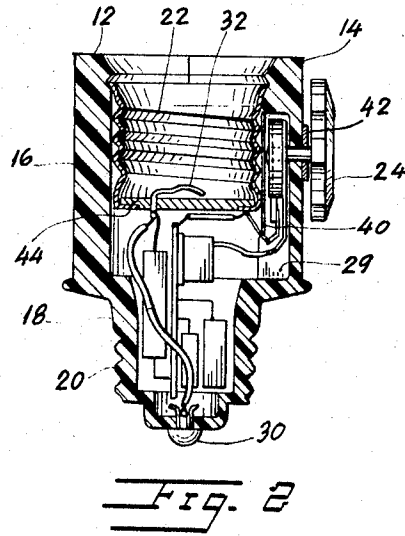
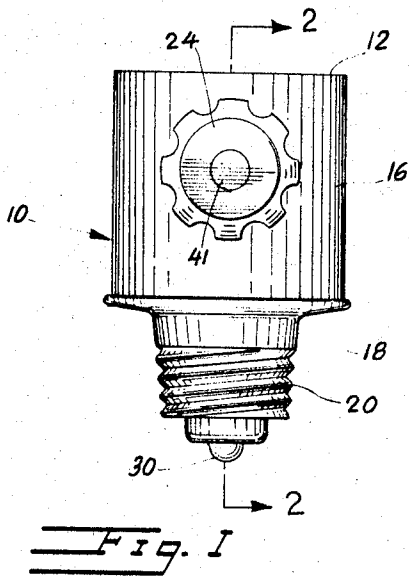
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3,452,215

LIGHT BULB SOCKET ADAPTER

Filed Sept. 26, 1966

Sheet 1 of 2



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Fig. 4

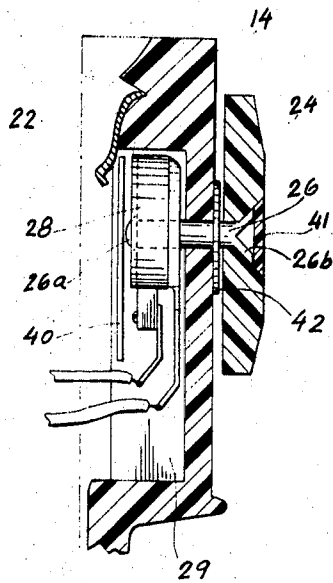


Fig. 5

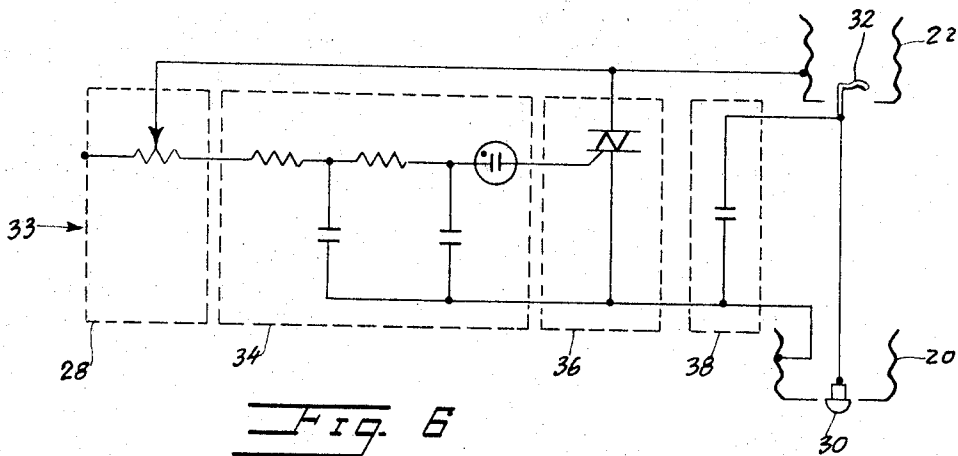
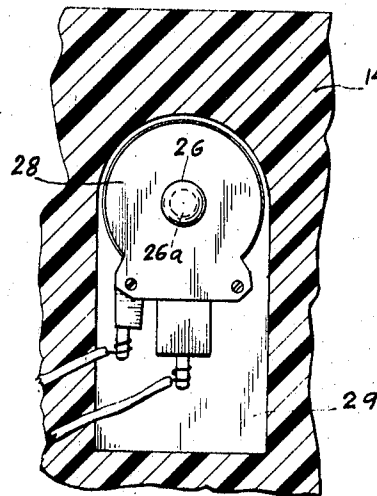


Fig. 6

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LIGHT BULB SOCKET ADAPTER

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1 Claim

ABSTRACT OF THE DISCLOSURE

An adapter for a light bulb socket having a phase shifting circuit for controlled dimming of output in conjunction with a resistive-capacitive charging circuit firing an avalanche made element which triggers a gate controlled full wave AC silicon switch which cyclically blocks and conducts.

The present invention relates to a light bulb socket adapter, and more particularly, to an adapter which is intended to be placed between a light bulb and its socket and which regulates and varies the intensity of illumination of the light bulb.

It is a primary object of this invention to provide a light bulb socket adapter which may be screwed into any light bulb socket, as, for example, sockets in lamp light fixtures, and into which may be placed a light bulb.

It is also an object of this invention to provide a light bulb socket adapter which can continuously vary the voltage phase and current flow supplied to the bulb.

It is another object of this invention to provide a light bulb socket adapter which may be adjusted to provide any desired wattage to a light bulb from zero up to the capacity of the bulb.

It is still another object of the present invention to provide a light bulb socket adapter which can change the degree of illumination of a bulb from zero up to the full illumination capacity of the bulb.

It is a further object of the present invention to provide an adapter for a light bulb socket which will permit the intensity of the light bulb to be continuously varied and, when set at a particular intensity, to maintain that intensity.

Basically, and not by way of limitation, the present invention comprises an adapter which may be screwed into a light bulb socket, which itself has a secondary light bulb socket and which has electronic circuitry designed to change the light bulb illumination intensity

In the drawing:

FIGURE 1 is a front view of a light bulb socket adapter in accordance herewith.

FIGURE 2 is a partial cross-sectional view taken across line 2-2 of FIGURE 1.

FIGURE 3 is a top view of the light bulb socket adapter shown in FIGURE 1.

FIGURE 4 is an enlarged view of a portion of FIGURE 2 showing in detail the control knob and potentiometer therein.

FIGURE 5 is a fragmentary cross-sectional view taken across line 5-5 of FIGURE 3.

FIGURE 6 is a schematic circuit diagram of the light bulb socket adapter in accordance herewith.

Referring to the drawing, the light bulb socket adapter 10 is comprised of two molded shells 12 and 14 which when joined together form a generally cylindrical hollow housing with an upper portion 16 and a lower portion 18 having an external thread. Screwed onto the external thread of lower portion 18 is a metal base sleeve 20 which has standard light bulb thread so as to enable socket adapter 10 to be screwed into a standard light bulb socket which is connected to a standard A.C. power source. Placed within upper portion 16 of socket adapter 10 is an upwardly opening internally threaded secondary light bulb

socket 22 which is adapted to receive standard light bulbs. Shells 12 and 14 may be molded from any suitable electrically insulating material such as a phenolic or other plastic.

A control knob 24 is mounted on a common shaft 26 with a variable potentiometer 28, control knob 24 thereby controlling potentiometer 28. Shaft 26 passes through the side wall of shell 14, potentiometer 28 being disposed in a cavity 29 molded into the side wall of shell 14. Cavity 29 is form-fitted to and prevents rotation of potentiometer 28 with respect to shaft 26.

A lower electrical contact 30 protrudes from the bottom center of lower portion 18 and an upper electrical contact 32 is centrally disposed within secondary light bulb socket 22.

The electrical circuit 33 shown in FIGURE 6 is primarily a phase shifting circuit which has four basic functional portions which are the potentiometer 28, a time delay network 34, an output switch 36 and a radio frequency interference filter 38, circuit 33 being in series with base sleeve 20 and secondary socket 22. Lower contact 30 and upper contact 32 directly connected to each other.

Potentiometer 28 controls the voltage phase angle and current flow to secondary socket 22 by its impedance value as selected by control knob 24, a zero impedance not changing the phase thereby permitting full current flow and hence full light bulb intensity and a high impedance substantially changing the phase thereby yielding only slight current flow and hence low light bulb intensity.

The time delay network 34 generates a trigger or gate when the current flow reaches a particular value as determined by the impedance of potentiometer 28. The trigger or gate is generated by the avalanche mode element, when the resistive-capacitive charging voltage reaches the firing threshold of the element. The trigger or gate thereby generated is applied to and energizes output switch 36 and turns on a light bulb which is screwed into secondary socket 22. Output switch 36 preferably is a gate controlled full wave A.C. silicon switch that switches from a blocking state to a conducting state for either polarity of applied A.C. voltage.

Output switch 36 receives a trigger or gate from time delay network 34 for each half cycle of the applied AC source voltage and de-energizes when each half cycle of the applied AC source voltage returns to zero.

Interference filter 38, which is connected between base sleeve 20 and upper contact 32, suppresses high frequency interference and noise which has developed as a result of the fast switching or energization of output switch 36.

The foregoing provides a socket adapter with the capability of continuous light bulb intensity control from zero intensity to full intensity and also of providing a stable operation at any given intensity level.

Molded shells 12 and 14 may be keyed into mutual alignment by molding therein suitable mating grooves and bosses not shown in the drawing. Shells 12 and 14 may be joined in any suitable manner such as by binding, welding or by use of an adhesive compound. An insulating spacer 40 may be placed between potentiometer 28 and secondary socket 22 to prevent shorting therebetween. Shaft 26 may be provided at one end with an enlarged head portion 26a and at the opposite end with an expanded flange 26b so as to position and secure potentiometer 28, shell 14 and control knob 24 thereon. Flange 26b may be provided with a decorative cover 41. An insulating washer 42 may be placed between shell 14 and control knob 24. A dielectric disk 44 may be provided to support and insulate upper contact 32. If desired a hole 46 may be provided in disk 44 to allow a suitable potting compound, such as an epoxy compound, to be inserted below disk 44 to "pot" or encapsulate the elements of circuit 33.

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While the foregoing is illustrative of a preferred form of this invention it is clear that modifications and other forms may be provided within the spirit of the invention and the scope of the claim.

What is claimed is:

1. A light bulb socket adapter, comprising:

(A) a housing, said housing having a threaded base portion for insertion into and electrical contact with a first light bulb socket which is connected to a power source and a second light bulb socket for threaded receipt of and electrical contact with a light bulb;

(B) a phase shifter circuit, said phase shifter circuit being electrically disposed between said first and said second sockets, said phase shifter circuit comprising:

(i) a variable potentiometer;

(ii) a time delay network, said time delay network receiving the output of said variable potentiometer and comprising;

(a) a resistive-capacitive charging circuit; and

(b) an avalanche mode element being con-

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ected to said resistive-capacitive charging circuit for generation of a gate output; and
(iii) an output switch, said output switch comprising:

(a) a full wave AC silicon switch, said full wave AC silicon switch being connected to said time delay network for receipt of and control by said gate output; and

(C) an interference filter.

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U.S. Cl. X.R.

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