Dec. 8, 1959 G. ULANET 2,916,572

ELECTRIC SWITCH RESPONSIVE TO THE MOVEMENTS OF THE HUMAN BODY DURING SLEEP

Filed May 23, 1958

Fig. 1

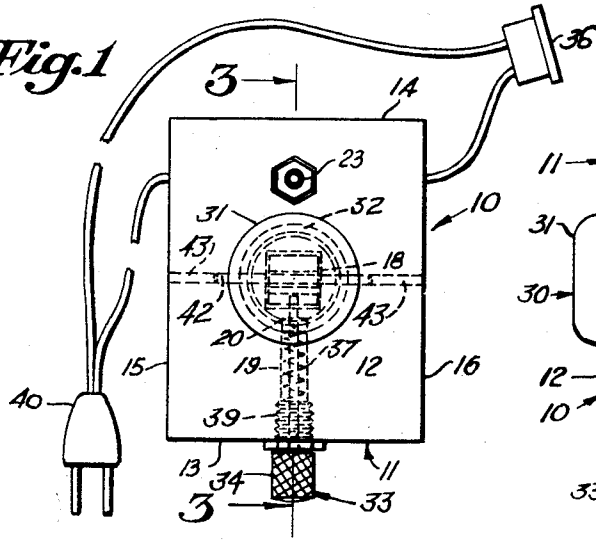


Fig. 2

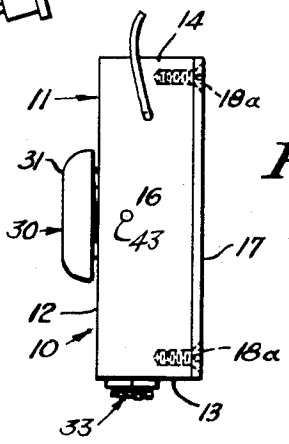


Fig. 3

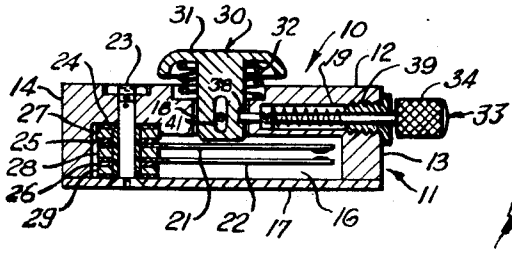


Fig. 4

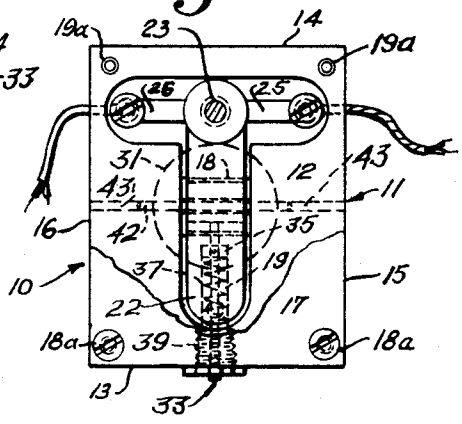
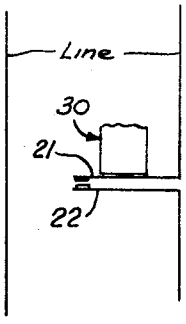


Fig. 5



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ELECTRIC SWITCH RESPONSIVE TO THE MOVEMENTS OF THE HUMAN BODY DURING SLEEP

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6 Claims. (Cl. 200—52)

This invention relates to an electric switch and especially to an electric switch responsive to the movements of the human body during sleep.

Heretofore, electric devices such as radio and television sets have been connected in a circuit with a timing device which is set to shut the set "off" at a predetermined hour when the person expects to fall asleep. Such preselected hour is, of course, pure conjecture so that the device may continue to operate long after the person actually falls asleep thereby adding to the discomfort of others.

It is an object of the instant invention to provide an electric switch responsive to the movements of the human body during sleep, the switch breaking the circuit to the electric device by the movements of the body after falling asleep.

A further object is to provide an electric switch which will not only turn the electric device "off" after the person falls asleep but will also prevent the device from being turned "on" again by subsequent movements of the body of the sleeping person.

Other objects of the instant invention will become apparent in the course of the following detailed description.

In the attainment of the aforesaid objectives, subject switch is constituted of a pair of normally open spring contact members in a casing, the contact members being connected in series with the electric device. A plunger, actuated for example by the head of a sleeping person, and reciprocal in the casing closes the spring contact members and the circuit to the electric device when the person retires. Any movement of the head of the person after falling asleep will release the plunger and open the contact members to break the circuit to the electric device. With the release of the plunger and the opening of the circuit, a second plunger in operable engagement with the first mentioned plunger locks the latter in the normally open position of the spring contact members so that subsequent movements of the head of the sleeping person will not again close the circuit to the electric device.

The invention will appear more clearly from the following detailed description when taken in conjunction with the accompanying drawings showing by way of example the preferred embodiment of the inventive concept.

In the drawings:

Figure 1 is a top view of the switch constructed in accordance with the principles of this invention;

Figure 2 is a side view of the switch shown in Figure 1;

Figure 3 is a sectional view along the line 3—3 of Figure 1;

Figure 4 is a bottom view of the switch shown in Figure 1 and in part section to more clearly show the internal construction; and

Figure 5 is a wiring diagram.

In Figures 1–4, reference numeral **10** indicates the switch constituted in part of the casing **11**.

The casing **11** is formed of a top member **12**, and end members **13** and **14** which may be formed integral with the top member as illustrated or otherwise. The casing is further formed of the side members **15** and **16** secured

along corresponding edges of the top and end members, and a bottom member **17**. The bottom member **17** is removably secured to the corresponding edges of the side and end members by any suitable fasteners **18***a*, numerals **19***a* in Figure 4 indicating threaded openings from which the fasteners **18***a* have been removed.

Through the top member **12** is an opening **18** (Figs. 1, 3, and 4) of substantially square cross section.

Through the end member **13** is another opening **19** (Figs. 1, 3, and 4) which is of maximum diameter from the outer end of the opening inwardly substantially to a point **20** (Fig. 1) and of minimum diameter from the point **20** inwardly in intersect at an angle the previously mentioned opening **18** of square cross section. The inner portion of the opening **19** having minimum diameter is concentric with that portion of the opening **19** having maximum diameter.

Within the casing **11** is a pair of normally open spring contact members **21** and **22** (Fig. 3) each of which is fixed at one end in the casing by a screw **23** (Figs. 1, 3, and 4). Numeral **24** (Fig. 3) indicates an insulating collar placed around the screw **23** while numerals **25** and **26** show terminals for connecting the spring contact members in series with the electric device (not shown) and an electrical energy source. Numerals **27**, **28**, and **29** are spacers for insulating the fixed ends of the contact members and their terminals from each other and, if necessary, from the casing. From the fixed ends, the contact members **21** and **22** extend forwardly in spaced arrangement and are substantially aligned with the previously mentioned opening **18** of square cross section through the top member **12**. Each contact member has a normally open contact point adjacent the free end as illustrated.

Reciprocal through the opening **18** of square cross section in the top member **12** is a plunger **30** as must clearly seen in Figure 3, the outer end of the plunger protruding above the top member **12** and the inner end designed for operable engagement with the most proximate spring contact member **21**. The outwardly protruding end of the plunger **30** is provided with a cap **31** which may be formed integral therewith or otherwise secured thereto in any known manner. To maintain the plunger under outwardly directed tension, a spring **32** (Fig. 3) is placed between the inner surface of the cap **31** and the top member **12** of the casing. A recess may be formed in the top member **12** as shown in Figure 3 to more thoroughly secure the spring. To prevent the plunger **30** from falling out of the casing **11**, a transverse slot **41** (Fig. 3) is made through the plunger **30** while through the slot is a pin **42** (Figs. 1 and 4) or the like which is inserted through any suitable opening **43** (Figs. 1 and 4) made through the top member **12** and aligned with the slot **41**.

Reciprocal in the previously mentioned opening **19** (Figs. 1, 3, and 4) in the end member **13** is a second plunger **33** (Fig. 4) which extends from the knob **34** on the outer end thereof inwardly through the opening **19** where the diameter is at a maximum, and thence through that portion of the opening having minimum diameter for operable engagement in a recess **38** (Fig. 3) formed in the first mentioned plunger **30**. To maintain the second mentioned plunger **33** under inwardly directed tension, a spring **37** (Figs. 1 and 4) is placed around the plunger **33** between the ends thereof, the spring being held adjacent the inner end of the plunger by a collar **35** (Fig. 4). Any known means may be used to fasten the collar to the plunger with the collar being seated against the inner end of that portion of the opening **19** having maximum diameter when the inner end of the plunger is in the recess **38** (Fig. 3) of the first mentioned plunger **30**. The opposite or outer end of the spring **37** is held in the opening **19** by a screw **39** (Figs. 1, 3, and 4) threaded into the outer end of the opening **19**. Obviously the spring

37 is under tension and the plunger 33 is reciprocal through the screw 39.

In operation: A radio or television set or other electric device (not shown) is plugged into a receptacle 36 (Fig. 1), and the plug 40 inserted in any suitable outlet in the supply of electrical energy. The switch is then placed, for example, under the pillow of the person about to retire. By pulling outwardly on the knob 34 (Figs. 1 and 3) of the plunger 33, the first mentioned plunger 30 will be released from the second mentioned plunger 33 and the weight of the head of the person on the pillow will move the plunger 30 inwardly in operable engagement with the spring contact member 21 to close the contact points of the contact members 21 and 22 and turn "on" the electric device. With any substantial movement of the head of the person on the pillow after falling asleep, the plunger 30 will be released, the spring 32 forcing it outwardly with the contact points of the spring contact members 21 and 22 moving to the normally open position to break the circuit to the electric device. The inner end of the second mentioned plunger 33 will then reenter the recess 38 of the plunger 30 to lock it in the open position of the contact points and thus prevent the electric device from being turned "on" again after another movement of the head of the sleeping person on the pillow.

While only one form of subject switch has been described and illustrated, other forms are possible within the scope of the appended claims.

What is claimed is:

1. An electric switch responsive to the movements of the human body during sleep, in combination with an electric device and a source of electrical energy, the switch comprising a casing, a pair of normally open spring contact members for the casing, means connecting the contact members in series with the device and the source of electrical energy, a plunger reciprocal in the casing and in operable engagement with one contact member, and means securely locking the plunger in the normally open position of the contact members after being closed, said last mentioned means comprising a second plunger in operable engagement with the first mentioned plunger, and means on the last mentioned plunger manually unlocking the plungers.

2. An electric switch for breaking the circuit to an electric device when a person falls asleep, the switch comprising a casing, a pair of normally open spring contact members disposed in the casing, means connecting the spring contact members in series with the electric device, and transverse means under inwardly directed tension in operable engagement with the first mentioned means whereby the contact members after being closed are locked in the normally open position thereof, the transverse means being disengaged from the first mentioned means by applying directly thereto a manually exerted and outwardly directed force.

3. A switch for breaking the circuit to an electric device when a person falls asleep, the switch comprising a casing, the casing having at least a top member and end members secured along corresponding edges, the top member having an opening of square cross section formed therein, a pair of normally open spring contact members disposed in the casing, means fixing one end of each contact member in the casing with the fixed ends insulated from each other and from the casing and with the free ends extended forwardly of the fixed ends in spaced arrangement and substantially aligned with the opening in the top member, a plunger reciprocal through the opening in the top member and in operable engagement with the most proximate contact member, the plunger having a recess formed therein, outwardly directed spring tension means maintaining the plunger in disengagement with the most proximate contact member, a second plunger reciprocal through an end member at an angle to the first mentioned plunger and in operable engagement with the recess therein, and means maintaining the second mentioned plunger under inwardly directed tension in the recess.

4. A switch according to claim 3 in which an opening of circular cross section is formed in an end member at an angle to the opening of square cross section and connecting therewith, the opening of circular cross section having maximum diameter adjacent the outer edge of the casing and minimum concentric diameter when connecting to the opening of square cross section, the second mentioned plunger being reciprocal through the opening of minimum diameter.

5. A switch according to claim 3 in which the tension means maintaining the second mentioned plunger under tension in the recess of the first mentioned plunger comprises a spring member, the spring member being secured at the inner end thereof by a collar disposed on the second mentioned plunger, and at the outer end by a screw through which said plunger is reciprocal.

6. An electric switch comprising, in combination, a casing, the casing having a top member and means for supporting the top member, the top member further having an opening formed therein, a pair of normally open spring contact members disposed in the casing, the fixed ends being insulated from each other and from the casing with the free ends extended forwardly of the fixed ends in spaced arrangement and substantially aligned with the opening, a plunger reciprocal through the opening and in operable engagement with the most proximate contact member, the plunger having an aperture formed therein, a second plunger under inwardly directed tension transversely disposed in the casing and in operable engagement with the aperture in the normally open position of the contact members, means maintaining the aperture and second mentioned plunger in alignment, and a knob disposed on the last mentioned plunger whereby said plunger can be manually released from the aperture.

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