Dec. 10, 1957 H. A. McINTOSH 2,816,213

LIGHTED ROOM THERMOSTAT

Filed Sept. 17, 1954

Fig. 1

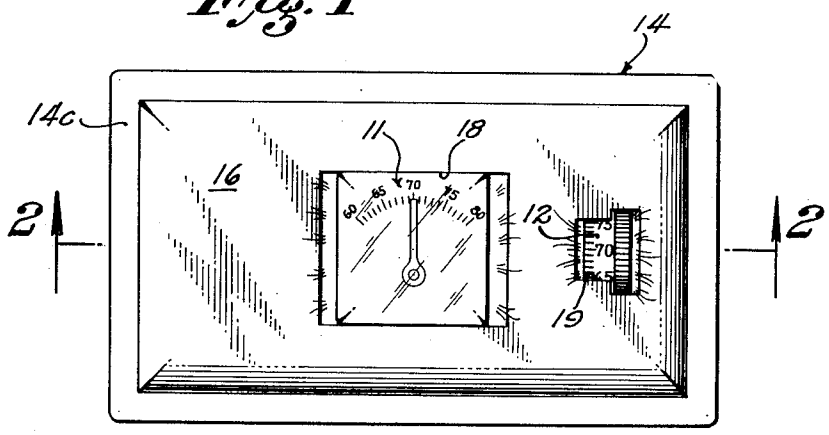


Fig. 2

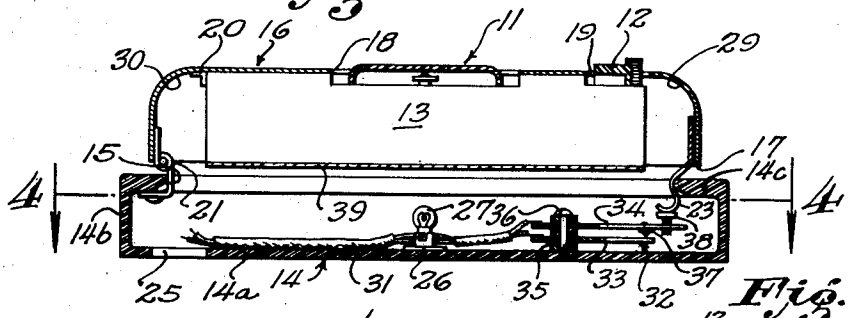


Fig. 3

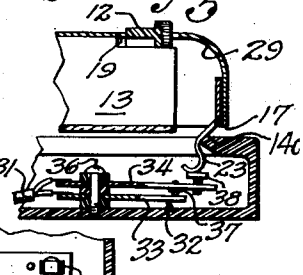
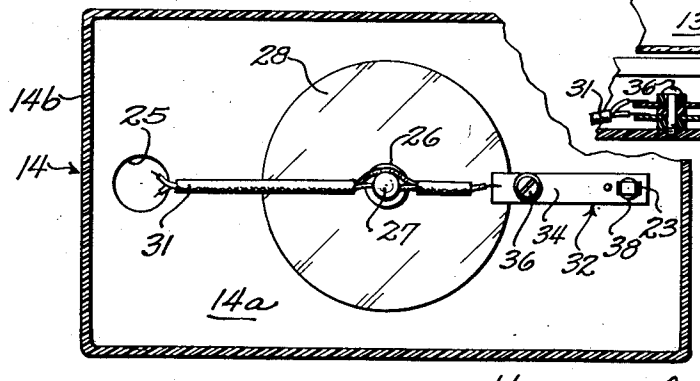


Fig. 4



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LIGHTED ROOM THERMOSTAT

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10 Claims. (Cl. 240—2.1)

This invention relates to a room thermostat structure, and more particularly to the provision of illumination for facilitating adjustment of the thermostat.

The primary object of this invention is to provide a simple structure making it possible properly to adjust the thermostat during the nighttime without requiring the room lights to be turned on. For this purpose, the thermostat structure is so constructed and arranged that its dial and thermometer may be illuminated by an electric lamp within the structure.

It is another object of this invention to provide a novel silent switch for controlling the lamp, movable to one position upon the exertion of a light force upon the housing or cover, and movable to the other position upon the removal of the force. For this purpose, the cover is mounted for limited movement with respect to the thermostat base, yielding means biasing the cover and base apart.

It is still another object of this invention to provide a hinged thermostat cover in which a spring latch for the cover permits limited movement of the cover and yieldingly urges the cover outwardly to provide bias for the switch.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of one embodiment of the invention. For this purpose, there is shown a form in the drawings accompanying and forming part of the present specification. This form will now be described in detail illustrating the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of this invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is an elevation of a room thermostat structure incorporating the present invention;

Fig. 2 is a sectional view, taken along the plane indicated by line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional view, similar to Fig. 2, showing the apparatus in an alternate position; and

Fig. 4 is a sectional view, taken along the plane indicated by line 3—3 of Fig. 2.

In Fig. 1 there is shown a room thermostat including as elements a thermometer 11 and a calibrated dial 12, having an adjusting knob, for adjustment of the thermostat.

The thermostat parts (not shown) are carried by a support 13. The support 13 is, in turn, supported within a two-part housing. One part of the housing comprises a hollow base 14 which may be made of insulation material or the like, and which is adapted to be placed against, or accommodated within a recess in, the wall of the structure.

The base 14 is generally of flattened box-like configuration, a bottom wall 14*a* of substantial area being adjoined by four side walls 14*b* of small width. The top wall is provided with a large rectangular opening 15 forming a continuous inwardly directed flange 14*c*. A rectangular shell 16, made of light metal material or the like, covers the base opening 15. The shell 16 has an opening defined by a continuous edge 17 that surrounds the base opening 15.

The thermometer 11, located within the cover or shell 16, has a transparent dial that projects slightly above the edges of a central rectangular aperture 18 of the cover 16. It is accordingly visible exteriorly of the cover 16.

The rotatable dial 12, by the aid of which the thermostat parts are adjusted, projects through an opening 19 in the cover 16 that conforms generally to the configuration of the dial 12.

The support 13 mounting the thermostat parts is secured in place within the cover by the aid of suitable securing means 20. The side walls of the cover 16 have substantial clearance with respect to this support 13.

The cover 16 is pivotally mounted upon the base 14 by the aid of a hinge 21 which permits the thermostat housing to be opened for access thereto. The hinge 21 is secured beneath the flange 14*c* at one end of the base 14.

A spring finger or catch 23, carried by the shell 16 at that side wall thereof opposite the hinge 21, holds the cover closed. The finger 23 projects downwardly beyond the edge 17 of the shell 16 and cooperates with the flange 14*c* for this purpose. The finger 23 has an intermediate deviation fitting about a thinned edge of the flange 14*c*.

The hinge 21 and the finger 23 are so placed upon the cover or shell 16 that the edge 17 of the shell 16 is spaced sufficiently above the flange 14*c* to permit air to enter for appropriately influencing the thermostat. Also, this mounting permits the shell 16 to be moved further toward the base 14 for purposes to be hereinafter described.

Appropriate electrical connections (not shown) for the thermostat structure may pass through an aperture 25 in the bottom wall 14*a* of the base 14 at the hinge end.

A lamp socket 26, cooperable with an incandescent filament lamp 27, is mounted on the bottom wall 14*a* substantially centrally thereof.

The lamp 27 is intended to provide illumination both to the thermometer 11 and the dial 12. For this purpose, light from the lamp 27 is permitted to pass outwardly of the cover 16 about the edges of the openings for the thermometer 11 and dial 12. The rectangular opening 18, in which the dial of thermometer 11 is fitted, has lateral edges spaced sufficiently from the corresponding marginal portions of the thermometer for this purpose. Also, the lateral edges of the opening 19 for the dial 12 are spaced sufficiently from the corresponding marginal portions of the dial 12.

Silvered surfaces are provided within the housing parts 14 and 15, such as at 28 about the lamp 27 on the bottom wall of the base 14, and at 29 and 30 on the inside of the side walls of the shell 16. These silvered surfaces reflect the light rays from the lamp 27 around and under the thermostat support 13 for passage outwardly of the slits formed in the shell 16.

To energize the lamp 27, leads 31 are provided that are controlled by a switch or circuit controller 32. The leads 31 may conveniently cooperate with a low voltage source.

The circuit controller 32 includes a pair of resilient contact arms 33 and 34 insulatedly supported in juxtaposed relationship by the aid of insulation spacers 35. These spacers are, in turn, secured upon the bottom wall 14*a* of the base 14 by the aid of a screw 36. The arms 33 and 34 are electrically connected respectively to the leads 31.

When the arms 33 and 34 are connected, the circuit through the lamp 27 is completed. One of the arms, in

this instance the upper arm **34**, carries a contact **37** engageable with the other arm **33** upon a slight flexure of the arms toward each other.

The arms flex toward each other in response to slight inward movement of the cover **16** past the closed position in which it is normally held by the catch **23**. Such inward movement of the cover may be caused by slight manual pressure on the cover.

The catch **23** permits this movement; its intermediate deviation, however, resiliently opposes the movement, since the sides of the deviation and the resilience of the catch tend to keep the cover **16** in a position in which the flange **14***c* is precisely seated at the bottom of the deviation. The curvature of the deviation is sufficiently small to permit a material range of movement of the cover **16** with respect to the base **14** without losing the centralizing effect of the deviation.

In the present instance, the catch is so formed as to provide a limit to the inward movement of the cover **16**. The path of movement of a relatively unyielding portion of the catch terminates at the outer side of the flange **14***c*.

Upon inward movement of the cover **16**, the terminal portion of the catch moves inwardly and slightly laterally, as shown in Fig. 3. Conveniently the circuit controller **32** is operated by this movement of the catch. The catch **23** engages the upper conducting arm **34** through an adjusting screw **38** mounted near the free end of the arm **34**. The terminal portion of the spring catch **23** is rounded to engage the flat upper surface of the adjusting screw **38**. In Fig. 3 the circuit controller **32** is closed to energize the lamp **37**. The catch **23** is electrically insulated from the cover **16**.

The light force required for moving the cover **16** to a position in which the lamp **27** is energized can be applied substantially at any area of the cover **16**. Force applied to the dial itself will also move the cover. The lamp **27** accordingly may be energized without substantial fumbling in the dark. Furthermore, the switch or circuit controller **36** operates substantially noiselessly.

Upon release of force, the resilience of the spring catch **23** causes the cover **16** to move to its normal position, opening the circuit controller **32** and deenergizing the lamp **27**.

A thin layer of insulation material **39** is secured to that portion of the thermostat support **13** opposite the lamp **27** to ensure that the heat of the lamp **27** does not affect the thermostat.

The inventor claims:

1. A wall thermostat structure including: a base; a cover for the base; a thermostatic element supported between the cover and the base; means supporting the cover on the base for resiliently resisted movement toward the base from a normal position; means for illuminating the thermostat; and means responsive to movement of the cover toward the base for operating said illuminating means.

2. A wall thermostat structure including: a base; a cover for the base; a thermostatic element supported between the cover and the base; means movably mounting the cover on the base; said cover and the base having means determining a limited relative position therebetween; a yielding latch for holding the cover in a normal position away from the limited position; said latch permitting movement of said cover from said normal position toward said limited position; means resiliently resisting said movement; energizable means carried by the base for illuminating said thermostat; control means for permitting and preventing energization of said illuminating means, and operable in response to movement of said cover and to return of said cover to said normal position.

3. A wall thermostat structure including: a base; a cover for the base; a thermostatic element supported between the cover and the base; means hingedly mounting the cover on the base; said cover and the base having means determining a limited relative position therebetween; a spring catch carried by the cover and engaging the base for determining a normal position of the cover away from said limited position; said spring catch permitting movement of the cover inwardly toward the limited position; an electrically energizable lamp carried by the base for illuminating said thermostat; and a circuit controller for said lamp operable to permit energization of said lamp upon inward movement of said cover.

4. A wall thermostat structure including: a base; a cover for the base; a thermostatic element supported between the cover and the base; means hingedly mounting the cover on the base; said cover and the base having means determining a limited relative position therebetween; a spring catch carried by the cover and engaging the base for determining a normal position of the cover away from said limited position; said spring catch permitting movement of the cover inwardly toward the limited position; said catch being moved upon inward movement of said cover; an electrically energizable lamp carried by the base for illuminating said thermostat; and a circuit controller for said lamp positionable in accordance with the position of said catch for permitting and preventing energization of said lamp.

5. A wall thermostat structure including: a housing, comprising a base member and a cover member; the cover member having an opening; means connecting the members for limited resiliently resisted movement toward each other; a thermostatic element supported on the cover and in the housing; a dial supported on the cover and within the housing for adjusting the element, and accessible for adjustment through said opening; there being clearance between the dial and the edges of the opening; a lamp in the housing for illuminating the dial; means responsive to relative movement of the housing members toward each other to operate the lamp.

6. A wall thermostat structure including: a housing, comprising a base member and a cover member; the cover member having openings; means connecting the members for limited resiliently resisted movement toward each other; a thermostatic element supported on the cover and in the housing; a dial supported on the cover and within the housing for adjusting the element, and accessible for adjustment through one of said openings; a thermometer supported in the housing and aligned with other of said openings; there being clearance between the dial and the edges of the opening with which it cooperates, as well as clearance between the thermometer and the edges of the opening with which it cooperates; a lamp in the housing for illuminating the dial and the thermometer; and means responsive to relative movement of the housing members toward each other to operate the lamp.

7. A wall thermostat structure including: a base; a cover for the base; a spring catch carried by the cover and having an intermediate deviation cooperable with an edge of the base for holding the cover in a normal position, the cover being movable toward the base from said normal position; said intermediate deviation of said catch permitting movement of said cover toward said base from said normally closed position, the deviation having a sufficient extent such that the edge moves along the deviation to flex the catch without passing beyond the deviation when the cover is moved toward the base; energizable means for illuminating said thermostat structure; and control means responsive to movement of said cover toward said base for operating said illuminating means.

8. A wall thermostat structure including: a base; a cover hingedly mounted on the base, an element of the cover being opposed to the base to define a limited closing position of the cover; a spring catch carried by the cover, and having an intermediate deviation that is non-parallel to the direction of movement of the catch; the base having means providing an edge entering the deviation; the edge being seated in the deviation when the cover is positioned away from said limiting position to determine a normal position of the cover with respect to the base; the catch

being increasingly flexed by relative movement of the edge along the deviation when the cover is moved toward said limited position to provide resilient resistance to such movement; the deviation having a sufficient extent with respect to the edge to provide a substantial range of resiliently resisted movement of the cover toward the base; energizable means between the cover and the base for illuminating said cover; and control means responsive to sufficient movement of the cover toward the limited position from the normal position thereof for operating said illuminating means.

9. A wall thermostat structure including: a base; a cover hingedly mounted on the base, an element of the cover being opposed to the base to define a limited closing position of the cover; a spring catch carried by the cover, and having an intermediate deviation that is non-parallel to the direction of movement of the catch; the base having means providing an edge entering the deviation; the edge being seated in the deviation when the cover is positioned away from said limiting position to determine a normal position of the cover with respect to the base; the catch being increasingly flexed by relative movement of the edge along the deviation when the cover is moved toward said limited position to provide resilient resistance to such

movement; the deviation having a sufficient extent with respect to the edge to provide a substantial range of resiliently resisted movement of the cover toward the base; energizable means between the cover and the base for illuminating said cover; and means responsive to said flexure of said catch for operating said illuminating means.

10. A wall thermostat structure including: a base; a cover for the base; a thermostatic element supported between the cover and the base; means supporting the cover on the base for movement toward and away from the base; means biasing the cover toward a normal position away from the base; means for illuminating the thermostat; and means responsive to movement of the cover toward the base for operating said illuminating means.

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