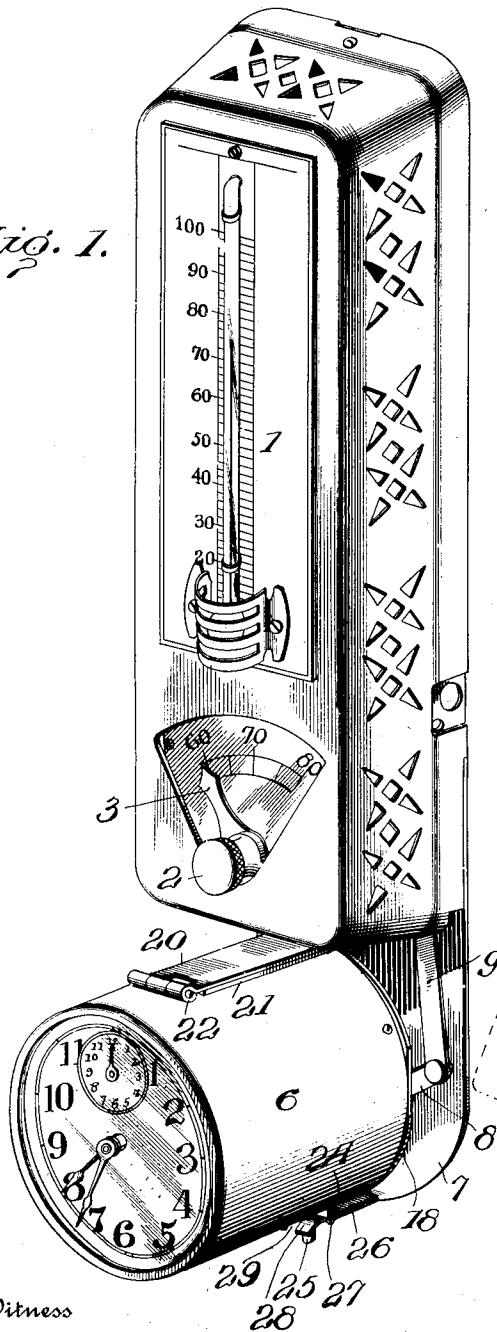


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 THERMOSTAT FOR ELECTRIC HEAT REGULATING SYSTEMS AND THE LIKE.
 APPLICATION FILED FEB. 16, 1916.

1,207,618.

Patented Dec. 5, 1916.
 2 SHEETS—SHEET 1.

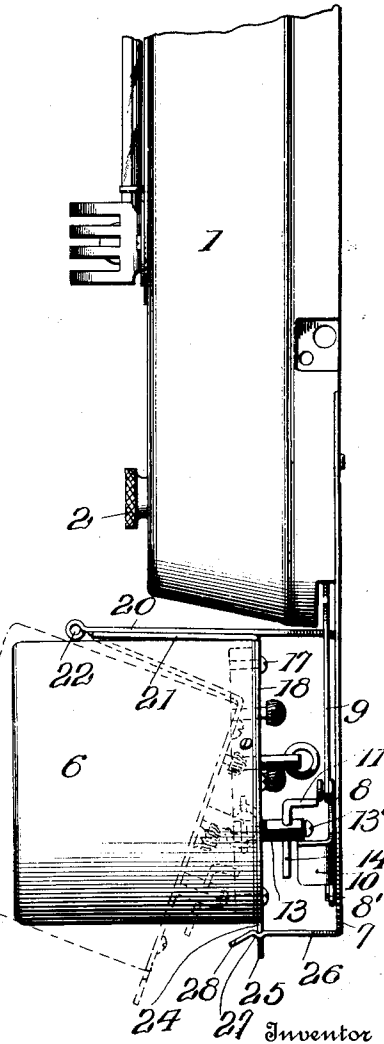
Fig. 1.



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By

Fig. 2.



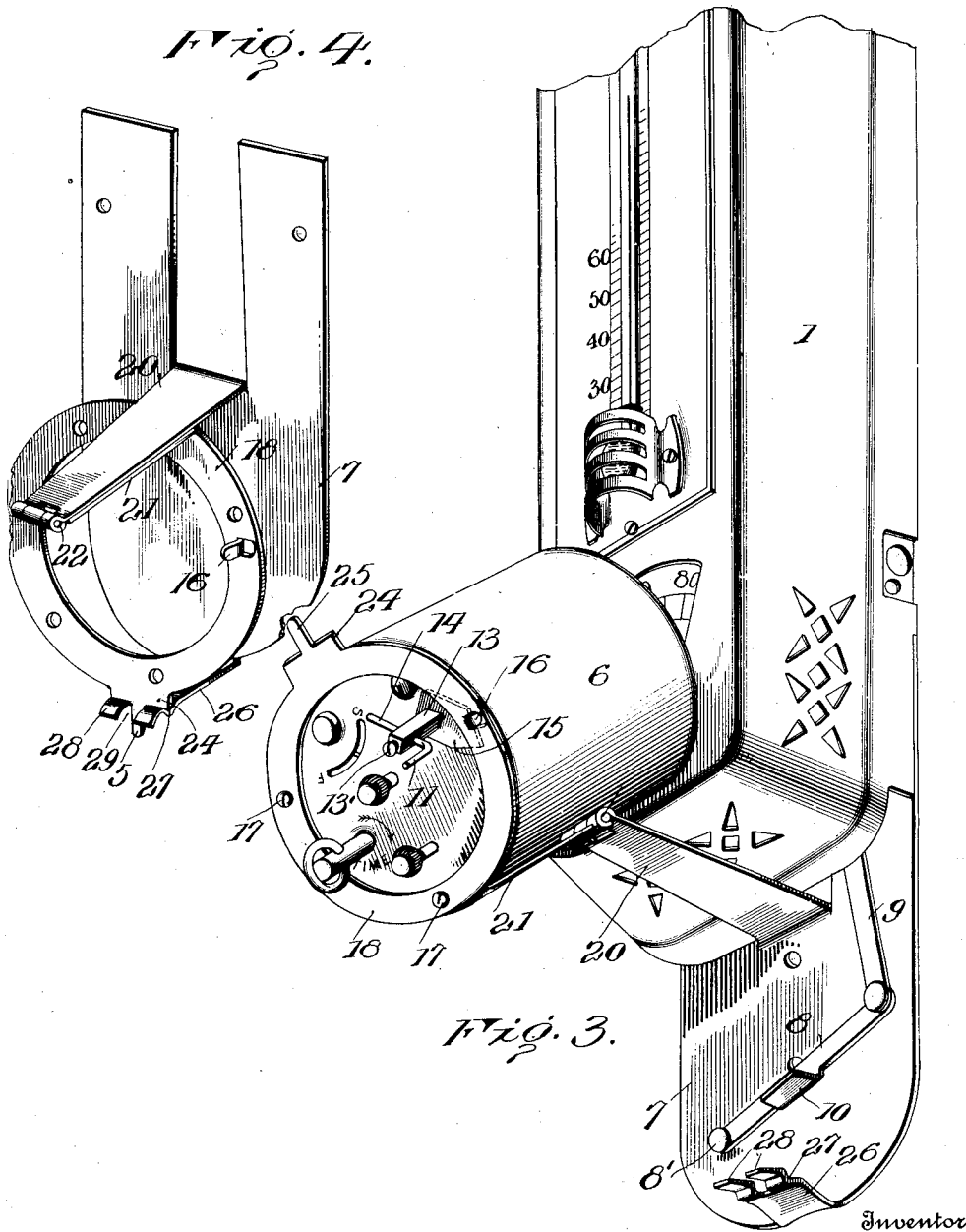
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UNITED STATES PATENT OFFICE.

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THERMOSTAT FOR ELECTRIC HEAT-REGULATING SYSTEMS AND THE LIKE.

1,207,618.

Specification of Letters Patent.

Patented Dec. 5, 1916.

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To all whom it may concern:

Be it known that I, JOHN F. OTIS, a citizen of the United States, and resident of Oswego, New York, have invented certain new and useful Improvements in and relating to Thermostats for Electric Heat-Regulating Systems and the like, of which the following is a specification.

This invention relates to certain improvements in thermostats for electric heat regulating systems and the like; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanation of the accompanying drawings showing what I now believe to be the preferred embodiment or mechanical expression of my invention from among other forms, constructions and arrangements within the spirit and scope thereof.

The object of my invention is to provide an electric circuit-controlling thermostat with an improved mounting for the timer or clock with which said thermostat is provided.

A further object of the invention is to provide an improved mounting for the clock or timer attachments of thermostats, that will be durable and inexpensive in structure; that can be readily applied to clocks of commerce and will accurately and firmly support the same; that will be easy and convenient in operation; that will render the clock conveniently and easily reversible for winding and setting without requiring free space or room at either side or edge of the thermostat to permit the reversal of the clock.

A further object of the invention is to provide a thermostat with an improved mounting for its clock or timer that will permit the clock to be completely reversed for winding without detachment of the clock and without swinging the clock to the right or left beyond the vertical boundaries of the space occupied by the thermostat so that the thermostats can be placed in narrow spaces between obstructions without interfering with the movement of the clock to and from operative position.

A further object of the invention is to provide certain improvements in arrangements of parts and in details of construction

for the production of a highly advantageous clock or timer mounting for the clocks of electric circuit closer thermostats, particularly for thermostats of the general type illustrated by the S. B. Post Patent No. 862,755, dated August 6, 1907.

The invention consists in certain novel features in construction and in arrangements and combinations as more fully and particularly set forth and specified hereinafter.

Referring to the accompanying drawings:—Figure 1, is a perspective view of a thermostat and its clock provided with a clock mounting in accordance with my invention. Fig. 2, is an edge view of the clock and its mounting showing a portion of the thermostat. Fig. 3, is a perspective showing the clock swung upwardly to reversed position for winding and setting. Fig. 4, is a detached view of the mounting.

Those skilled in the art are familiar with the construction and operation of thermostats employed in electric heat regulating systems, and hence I do not herein describe the thermal bar of the thermostat, the contacts with which said bar cooperates in making and breaking the electric circuit where by the dampers of the heating apparatus are controlled through the medium of a suitable motor, the adjusting mechanism whereby the relative position of the bar and the contacts is changed to cause a certain shifting of the dampers at a predetermined temperature, and the manner of coupling the clock actuated operating means with said mechanism.

In the drawings, the thermostat is generally indicated by the reference numeral 1, and the adjusting mechanism by the reference numeral 2, although what appear in the drawings in this respect, are the outer cover, case or housing of the supporting back or body of the housing, the finger wheel or knob by which the adjusting mechanism is manually operated or set, the pointer 3, moving with said knob and mechanism over a temperature degree indicating scale to show the position of the contacts with respect to the bar. The thermal bar, contacts, and adjusting mechanism are arranged behind said cover or case that appears in the drawings.

The supporting back plate or member of

the case is provided with a vertical extension from its lower end projecting downwardly beyond the lower end of the case to provide a support for the clock or timer 6, and for the means operated by the clock and coupled to the adjusting mechanism to shift the same by the power of the clock at a predetermined time. This extension in the example illustrated, consists of a preferably sheet metal plate 7, at its upper end extending into or behind the case and suitably fixed or otherwise secured thereto and supported thereby.

The clock actuated means for shifting the adjusting mechanism consists of a lever 8, and a link 9, arranged at the front face of the plate 7. The lever extends transversely of the plate and at one end is pivotally confined to the plate by a pin 8', so that the free end of the lever can swing vertically. The lower end of the link 9, is pivotally joined to the free end of the lever and extends upwardly therefrom into the case through the lower end thereof, and within the case said link is coupled to the adjusting mechanism to shift the same, as will be readily understood by those skilled in the art. At a point between its pivotal point and its free end, the lever is formed with an outwardly projecting front flange or lip 10, to be engaged by an arm or projection 11, extending rearwardly from the rear end of the clock and connected with the alarm mechanism thereof, to swing the lever and actuate the adjusting-mechanism shifting means at the time predetermined by the previous setting of the alarm mechanism of the clock, as will be understood broadly by those skilled in the art.

I preferably employ an ordinary cylindrical clock 6, having suitable alarm mechanism, the gong or bell being omitted. The ordinary finger piece or handle for winding up the alarm mechanism is preferably removed, and in place thereof I usually substitute a head 13, having a transverse perforation through which a cross bar 14, extends and in which it is adjustably held by a set screw. One end of this bar is bent outwardly at right angles to form said rearward projection 11, to engage and swing lever 8. This bar also provides a handle by which the alarm mechanism can be wound up. This head is also preferably provided with a rigid radially projecting finger 15, arranged comparatively close to the rear end face of the clock to limit the winding rotation of the head through engagement with a fixed stop 16.

The clock is supported from its rear end, and is pivotally connected to the extension plate of the thermostat case or support through the medium of a longitudinal hinge connection to permit reversal of the clock for winding and setting. To this end,

I show the clock fixedly secured by machine screws 17, or other suitable clamping means, to a supporting ring or flat annular stiff plate 18. This plate is parallel with the rear end face of the clock, and the rear annular rim or flange of the clock case abuts the front face of this plate. The annular inner edge portion of the plate overhangs and is spaced rearwardly from the rear end face of the clock while the center of the plate is open to expose and render the various winding and setting knobs or handles of the clock accessible. The radial stop finger 15, of the alarm winding head or handle can project under this plate during a portion of its movement, and I provide the stop 16, by cutting a lip from the body of the plate between its inner and outer annular edges, and bending the same inwardly toward the rear face of the clock and at right angles to the plane of the plate.

The screws 17, extend inwardly through perforations in the plate and enter tapped holes provided therefor in the rear end of the clock case or frame to rigidly secure the plate and clock together. This plate and the depending extension of the thermostat case are hinged together by approximately parallel elongated outwardly extending stiff arms or hinge leaves pivotally joined together at their otherwise free outer ends. These arms can be variously arranged and positioned and the pivotal connections can be variously arranged and positioned, and I do not wish to limit my invention to the exact number and arrangement of arms and pivots shown in the drawings, although in the specific example illustrated, I show but one pair of arms to form one hinge having a transverse or horizontal axis on which the hinge opens and closes as the clock moves upwardly and downwardly to and from operative position. In this form, the depending plate or case extension is longitudinally cut to form an elongated tongue which is bent outwardly at right angles to provide the horizontal outwardly extending stiff hinge leaf or arm 20, just above the clock (when in operative position) and just below the lower end of the case and extending outwardly a distance beyond the vertical plane of the vertical front longitudinal face of the case and almost to the front end of the clock. The plate fixed to the rear end of the clock and supporting the same, is provided with a stiff arm or hinge leaf 21, preferably integral therewith and extending forwardly from the central portion of the top edge of said plate and located below the arm 20, and longitudinally and centrally of and above the clock case. At their outer ends these two preferably flat approximately-parallel superimposed arms, are pivotally united by a transverse or horizontal pivot or hinge pin 22, held by aligned transverse eyes of the

arm ends, or in any other suitable and desirable manner.

If so desired, means can be provided to detachably lock or hold the clock support in normal position (Fig. 1) with the clock supported thereby in horizontal position with its face vertical and exposed at the front and with its rear end parallel with and spaced a distance forwardly from the front vertical face of the case extension and with the alarm operated arm or projection 11, in operative relation with respect to the lip or flange of the lever 8. As an example of means that can be provided for this purpose, I show what is approximately a spring catch between the central lower edge of the annular clock supporting plate and the lower end of the thermostat case extension consisting of a radially projecting catch, lip or flange 24, integral with and depending from the central lower edge of said plate and having a central projecting finger 25, and a short horizontal spring keeper or arm 26, projecting outwardly from the lower edge of said extension with the upper side of its free end formed with a transverse seat, shoulder or depression 27 and beveled or inclined outwardly and downwardly (at 28) from said depression and longitudinally slotted at 29. When the clock is in operative position, the outer transverse edge of the flange 24, rests in said depression 27, and the finger 25, rests in said slot 29, and projects downwardly below the spring arm 26, and the upward spring of said arm holds the parts locked together in this position and engagement.

When, for any reason, it is necessary to gain access to the rear end of the clock, the free end of the arm 26, can be pressed back (down) and the finger 25, can be pressed up, and the flange or catch 24, will be released from the arm or keeper 26, and the clock can then be swung upwardly and back (on the pin 22 as an axis) until the clock is in elevated completely reversed position with its front face engaging the front side of the case or the adjusting mechanism knob projecting forwardly therefrom. When the clock is in this position, the various winding and setting devices at the rear end thereof are accessible and can be conveniently manipulated.

When the clock is swung down to normal position it can be restored to and locked in operative position, by merely applying the necessary inward pressure, to cause the catch to spring back the keeper and allow the catch to snap into place in the holding depression 27, of the keeper. This spring catch will firmly hold the clock in operative position against accidental displacement. The clock during its vertical swing to and from operative position, is entirely located in front of the thermostat case and its

downward extension, and does not require free or unobstructed space on either side of said case and its extension.

Advantages in practice are attained by supporting the clock entirely from its rear end and attaching the same to the thermostat through forwardly extending long arms pivotally united at their front ends irrespective of the number of arms employed and the direction in which the clock swings, and specific advantages are attained by the example illustrated, by arranging the clock mounting to permit the clock to move always in front of the thermostat and its extension.

The cross bar 14, is adjustably held by the set screw 13', so that on loosening the set screw, the bar can be adjusted longitudinally to set the rearwardly projection or crank arm 11, at the desired position with respect to the flange 10, of lever 8, or to vary the operative stroke of said projection 11, and of the lever 8. The radial stop finger 15, and the stop 16, prevent the projection 11, making more than one complete revolution and also determine the starting point of said projection 11, after winding of the alarm mechanism.

Those skilled in the art understand the function performed by and the operation of the clock or timer attachments and the adjusting-mechanism shifting means actuated thereby, in thermostats for electric heat regulating systems, and hence I do not herein describe the operation of such thermostats and their clock attachments.

It is evident that various changes, modifications and variations might be resorted to without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact disclosures hereof.

What I claim is:—

1. The combination of a thermostat, and its adjusting mechanism, of a clock, a mounting for said clock comprising a clock supporting plate secured to the rear end of the clock and spaced from the rear face thereof, and a hinged supporting connection between said plate and said thermostat, said clock having alarm mechanism provided at the rear end of the clock with a rotary winding head, a cross bar carried by and longitudinally adjustable through said head and forming the handle for rotating the same to wind said mechanism, said bar having one end projected rearwardly, means actuated by said rearwardly projected end to shift said adjusting mechanism, said supporting plate having a projecting stop, and a radial stop arm rigid with said head and movable beside said plate to engage said stop.

2. The combination with a thermostat, and its adjusting mechanism, of a clock, means actuated by the clock for shifting said adjusting mechanism, and a mounting

for said clock comprising a clock supporting plate secured to the rear end thereof and whereby said clock is supported solely from its rear end and supporting hinge leaves for
5 said clock extending forwardly and longitudinally of and exteriorly with respect to said clock and pivotally united at their outer ends to form the axis on which said plate is swingable in carrying the clock to and from
10 reversed and operative positions.

3. The combination with a thermostat, and its adjusting mechanism, of a clock, means actuated by the clock for shifting said adjusting mechanism, and a mounting for said
15 clock on which the clock is swingable on an axis arranged in advance of its rear end in moving to and from reversed and operative positions, said mounting comprising a support, a clock supporting plate fixed to the
20 rear end thereof, and elongated plate carrying arms rigid with and projecting forwardly from said support and said plate longitudinally and exteriorly of the clock and at their front ends pivotally joined together.

25 4. The combination with a thermostat, and its adjusting mechanism, of a clock, means actuated by the clock for shifting said adjusting mechanism, and a mounting for said clock having an axis arranged in advance of
30 the rear end of the clock and on which the clock is swingable to and from reversed and operative positions, said mounting comprising an arm projecting forwardly exteriorly of the clock and provided with a support, a
35 corresponding arm projecting forwardly exteriorly of the clock and at its rear end fixed thereto, and a transverse pivot coupling the

outer ends of said arms together and constituting said axis.

5. A thermostat case having a downward
40 plate extension provided with an elongated forwardly projecting arm, in combination with a horizontally arranged forwardly projecting clock adapted to be swung to and
45 from said normal operative position and reversed position, and a clock supporting plate arranged at and secured to the rear end of the clock and provided with an elongated
50 arm extending forwardly at the exterior of the clock and at the inner side of said first mentioned arm and at its outer end pivoted to the outer end of said first mentioned arm.

6. A thermostat support provided with
55 and supporting an upper forwardly projecting arm and with a spring keeper, in combination with a clock having a supporting plate secured to its rear end and provided with a catch to engage said keeper and with
60 an upper forwardly extending arm at its outer end hinged to the outer end of said first mentioned arm to swing on a horizontal axis, whereby said clock can swing upwardly
in front of said support.

7. A thermostat support provided with a
65 forwardly projecting arm and a spring keeper formed at the lower edge of said support comprising a forwardly projecting slotted arm, in combination with a clock having
70 a supporting plate secured to its rear end and provided with a catch adapted to engage said slotted arm and with a forwardly extending arm at its outer end hinged to the outer end of said first mentioned arm.

JOHN F. OTIS.