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SETTING MECHANISM

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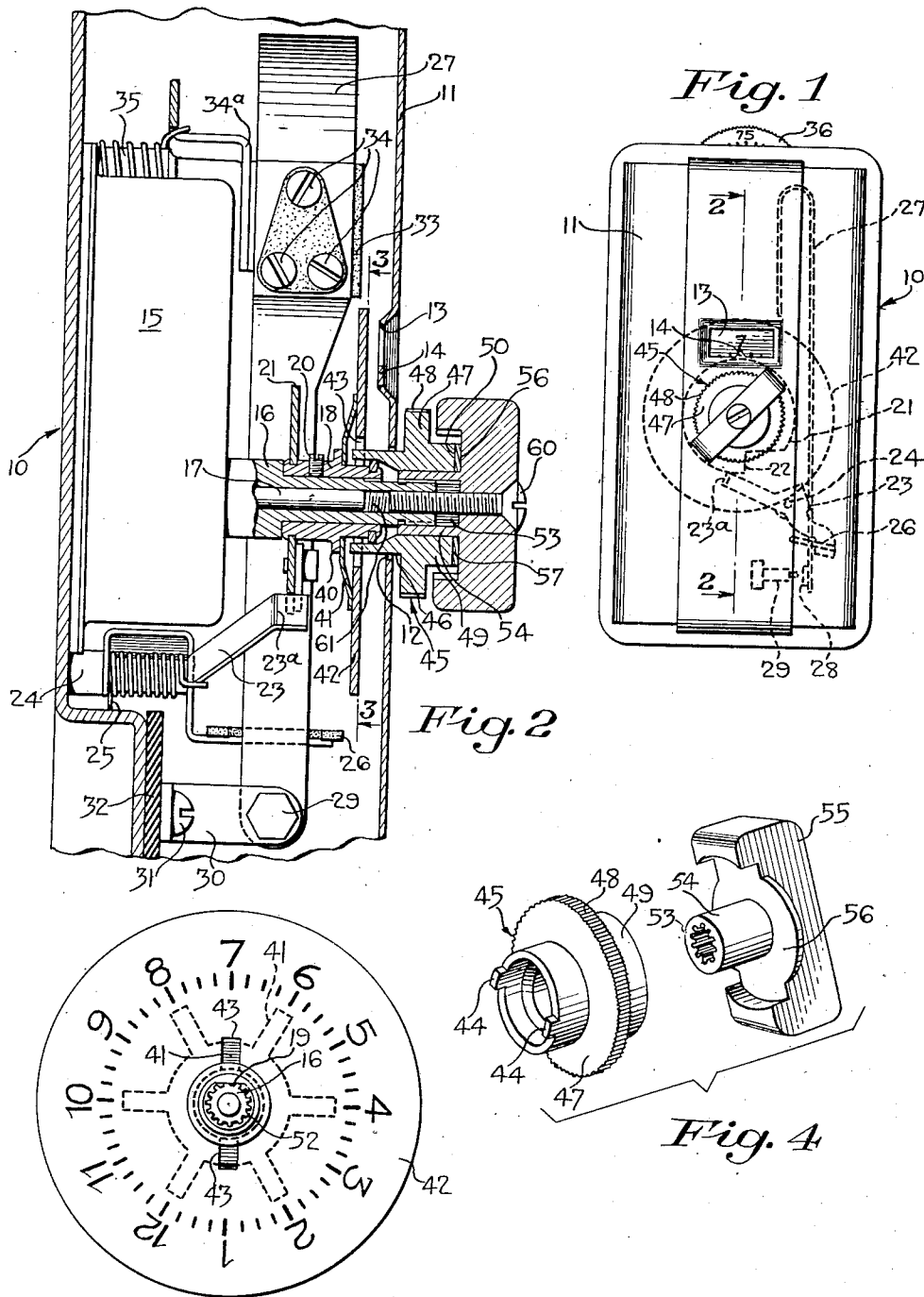


Fig. 3

Fig. 4

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SETTING MECHANISM

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3 Claims. (Cl. 161—1)

This invention relates to setting mechanism and more particularly to a type of setting mechanism adapted for use with a timed operating device adapted to control other mechanism and hold the same in or out of operation for a predetermined length of time.

One object of this invention is the provision of an improved setting mechanism wherein the length of time for which the associated device is to remain operative or inoperative may be readily determined without the use of mental arithmetic.

An additional object is the provision of such a mechanism wherein the setting device is operably associated with the actuating mechanism in such manner that it is controlled thereby during the operation of the device.

An additional object is the provision of a setting mechanism including a member having numerals thereon and a pointer, whereby the juxtaposition of a given numeral to the pointer will indicate the time of day at which the operating mechanism will be deenergized provided a number has been previously juxtaposed to the pointer indicative of the time of day at which the instrument is first adjusted.

An additional object is the provision of a device including a dial having sequential numerals thereon whereby upon the juxtaposition of the last numeral of the sequence to a pointer, rotation of the dial and operating mechanism juxtaposes a second numeral to the pointer which indicates the number of hours the device will remain in operation.

A further object is the provision of such a mechanism which will be readily understandable, simple in operation, and economical and durable in construction.

Other objects will in part be obvious and in part be pointed out hereinafter.

The invention accordingly consists in the combinations of elements, arrangements of parts and features of construction all as will be more fully described hereinafter and shown in the accompanying drawing and the scope of the application of which will be indicated by the appended claims.

Referring now to the accompanying drawing wherein is shown one of the various possible embodiments of this invention:

Figure 1 is a front elevational view of a device embodying the instant invention;

Figure 2 is an enlarged side sectional elevational view taken along the line 2—2 of Figure 1 as viewed from the left, certain of the parts be-

ing shown in a different position of adjustment;

Figure 3 is a side sectional view taken along the line 3—3 of Figure 2 as viewed from the right, certain parts being omitted, and

Figure 4 is an exploded perspective view of certain of the elements shown in Figures 1 and 2.

Similar reference characters denote similar parts throughout the several views of the drawing.

A base plate 10, shown in Figures 1 and 2, is adapted for mounting on any suitable surface, such as a wall, and has secured thereto, in any suitable manner, a casing 11. Casing 11 is provided with an aperture 12 which may be circular in form to permit the passage of certain elements to be hereinafter described therethrough. A second aperture 13 is also formed in casing 11 and has positioned therein a pointer 14, the purpose of which will be more fully pointed out hereinafter. Suitably secured to base plate 10 is a casing 15 which contains a clockworks which may be of any suitable form but which is preferably of the type disclosed in the copending application of Andrew G. McNicoll, Serial No. 98,288, filed of even date herewith entitled "Starting mechanism". The clockworks drives a sleeve 16 mounted for rotation on a suitable pin 17. Secured to sleeve 16 is a collar 18 which is held against rotation thereabout as by means of a flattened portion 19. A set screw 20 serves to hold collar 18 against linear displacement. A cam-like disc 21 is secured in any desired manner to collar 18 for rotation therewith. Disc 21 has a cut-away portion 22, as better shown in dotted lines in Figure 1, adapted to be engaged under certain circumstances to be hereinafter described by an inwardly turned projection 23a carried by a bell crank lever 23, which latter is in turn pivoted upon a post 24. A spring 25 serves normally to bias projection 23a against disc 21. The opposite end of bell crank member 23 has secured thereto an insulating block 26 positioned for engagement with the distal end of a bimetallic strip 27 which carries a contact 28. Contact 28 is adapted to engage a contact screw 29 carried by a bracket 30 secured, as by a screw 31, to an insulating block 32 carried in turn by base plate 10. The proximal end of bimetallic member 27 which is substantially U-shaped is secured as best shown in Figure 2 to an insulating block 33, as by screws 34. Block 33 is secured to a member 34a, which in turn is pivotally mounted for rotation about a mounting post 35. Adjusting means of any suitable type but which may well be of the type shown in the

co-pending application of Carl G. Kronmiller, Serial No. 98,326, filed of even date herewith, entitled "Thermostat", are provided in order that the temperature value which will cause contact 28 to engage contact screw 29 may be varied. Such means may include an adjusting wheel 36 calibrated to designate the temperature to which the mechanism will respond.

Thus from the foregoing, it will now appear that when insulating block 26 is out of engagement with bimetallic strip 27, contact 28 is free to engage with or separate from contact screw 29 in accordance with temperature variations as controlled by the relative flexing of bimetallic strip 27. Such engagement or disengagement causes the closure and opening of a circuit for any desired purpose but which may be readily adapted for the control of a heating system, all as are more fully set forth in the above mentioned Kronmiller application. However, when contact 28 is positively held in engagement with contact screw 29 by insulating block 26, the circuit is maintained continuously closed whereby fluctuations in temperature have no effect on the relationship of the contacts above mentioned. In the illustrative embodiment of the invention herein shown and described, the arrangement is such that such engagement of contact 28 with contact screw 29 occasioned by the pressure of insulating block 26 takes place during that period when the timed operating mechanism contained in casing 15 is inoperative. However, it will be readily understood that if desired the reverse arrangement may be effected whereby contact 28 will be held positively out of engagement with contact screw 29 during the operative period of the clock mechanism.

Means now to be described are provided for the proper positioning of cam-like disc 21 in order that the cut-away portion 22 thereof may be positioned in such manner that it may align itself with projection 23a of bell crank lever 23 after a predetermined time interval. Sleeve 18 is provided with an annular ridge 40 against which rests a spring collar 41 adapted to abut the inner surface of a dial 42. The outer surface of the dial 42 engages the inner surface of a knob generally designated at 45. Dial 42 bears upon its surface a series of numerals which in the illustrative embodiment herein shown range from 1 to 12 and correspond to the hours of the day. The arrangement is such that one of these numerals is designed to be exposed through aperture 13 adjacent pointer 14 and as the dial is rotated in a manner and for a purpose to be hereinafter described. A pair of slots 43 are provided in dial 42 and engage depending lugs 44 carried by the knob generally indicated at 45 which comprises a sleeve 46 adapted to extend through aperture 12, an annular rim 47 provided with peripheral serrations 48 and an upper circular portion 49 having a bearing surface 50. Sleeve 16 is provided adjacent its outer extremity with a plurality of splines 52, arranged for engagement with a series of grooves 53 carried by the interior of a depending sleeve-like member 54 which comprises a portion of a handle 55. Handle 55 has an interiorly positioned bearing surface 56 adapted to abut a friction disc 57 positioned between surfaces 50 and 56. A screw 60, passed through a suitable bore in handle 55, engages a threaded interior portion 61 of sleeve 16 to maintain the parts in related assembly.

From the foregoing, it will be seen that rotation of knob 45 by serrations 48 causes rotation

of dial 42 independently of sleeve 16 and/or operating handle 55, since the strength of the driving connection provided by spring disc 41 is insufficient to occasion rotation of handle 55 through disc 57 and since otherwise dial 42 is free to rotate about sleeve 16. Conversely, however, it will be seen that the friction occasioned by spring disc 41 is sufficient to insure movement of dial 42 when handle 55 is rotated either manually or by means of the clock mechanism contained within casing 15. The arrangement of the device is such that rotation of handle 55 tensions a suitable main spring (not shown) contained in the clockworks to drive the clockworks and hence sleeve 16 for a predetermined period of time. Stop means (not shown) are also provided to preclude operation of the clock mechanism beyond the desired period. As stated above, rotation of handle 55 causes rotation of dial 42 and consequently upon such rotation of handle 55, the numeral adjacent pointer 14 is changed. Rotation of knob 45, however, does not cause rotation of handle 55 nor any change in the position of the operating mechanism. Accordingly, if a given number is positioned adjacent the pointer by rotation of knob 45 and the handle 55 subsequently rotated, a second number is then positioned adjacent pointer 14. Thus, if the first number corresponds to the time of day, the second number indicates the time of day at which the operating period of the device will terminate, or if the number originally adjacent pointer 14 is 12 or the last number in the series about the periphery of dial 42, the number adjacent pointer 14 after rotation of handle 55 indicates the number of hours the device is to operate.

Thus, it will be seen, that if the resident of the dwelling or other place where the device is situated desires that the circuit controlled by the device be placed under the control of the temperature adjacent the device for a period of 4 hours, illustratively, he need only turn dial 42 by means of knob 45 until the numeral 12 is adjacent pointer 14 and then rotate handle 55 until the numeral 4 is adjacent pointer 14 whereupon the device will run for 4 hours. If, however, the time of day is, say, two o'clock and the operator desires that the mechanism operate until five o'clock, he need only rotate dial 42 by knob 45 until the number 2 is adjacent pointer 14 and then rotate handle 55 and hence dial 42 until the number 5 is adjacent pointer 14, in which case the operating mechanism will operate until five o'clock, at which time the latch means comprised of insulating block 26 will be actuated in the manner above described to hold contact 28 in positive engagement with contact screw 29 until such time as the device is reset.

In Figure 1, illustratively, the mechanism is shown in operative position having been set to become inoperative at seven o'clock. After a substantially complete operating period of the device, or a full rotation of disc 21, which in the illustrative embodiment shown is approximately 11 hours, during which time the clockworks will have caused disc 21, dial 42, and handle 55 to rotate in a counterclockwise direction as viewed in Figure 1, cut-away portion 22 is again adjacent projection 23a of bell crank lever 23 and projection 23a is forced inwardly into cut-away portion 22 by spring 25 whereupon insulating block 26 causes contact 28 to be moved into engagement with contact screw 29 where it will remain until such time as the apparatus is manually reset. This position is shown in Figure 2.

Thus, the only operations necessary to a proper setting of the mechanism comprises rotating dial 42 by knob 45 until a number indicative of the time of day, or the last number of the series is adjacent pointer 14, and subsequently rotating handle 55 until a second number, which may indicate either the time of day at which it is desired the operating period shall terminate or the number of hours, if the numeral 12 has been juxtaposed to pointer 14, it is desired that the device be operative, thus obviating the necessity of any mental arithmetic or calculation of any sort. When such operations have been performed, the clock mechanism will rotate the parts until the device becomes inoperative at the predetermined time in the manner above described.

Thus, from the foregoing, it will be seen that there is herein provided a device which accomplishes the objects of this invention in a satisfactory and reliable manner and includes many advantages of great practical importance.

As many embodiments may be made of this invention and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is merely illustrative and to be limited only by the scope of the appended claims.

I claim as my invention:

1. In a device of the class described comprising in combination, a casing, a first aperture in said casing, a spring wound clockworks in said casing, rotatable means extending through said aperture for winding said clockworks, a control device rotated by said rotatable means and fixed with respect thereto, indicating means frictionally mounted on said rotatable means inside said casing, said indicating means being free to rotate with said rotatable means at all times, a second aperture in said casing whereby a portion of said indicating means is visible from outside said casing, means outside said casing for rotating said rotatable means and hence said indicating means, and means for rotating said indicating means relatively to said control device.

2. In a device of the class described comprising in combination, a casing, a first aperture in said casing, a spring wound clockworks in said casing, rotatable means extending through said aperture for winding said clockworks, a control device rotated by said rotatable means and fixed with respect thereto, indicating means frictionally mounted on said rotatable means inside said casing, said indicating means being free to rotate with said rotatable means at all times, a second aperture in said casing whereby a portion of said indicating means is visible from outside said casing, means outside said casing for rotating said rotatable means and hence said indicating means, and means for rotating said indicating means relatively to said control device, said last mentioned means comprising a knob outside said casing and mounted concentrically with respect to said rotatable means, said knob having means operatively connecting it to said indicating means.

3. In a device of the class described comprising in combination, a casing, a first aperture in said casing, a spring wound clockworks in said casing, rotatable means extending through said aperture for winding said clockworks, a control device rotated by said rotatable means and fixed with respect thereto, indicating means frictionally mounted on said rotatable means inside said casing, said indicating means being free to rotate with said rotatable means at all times, indicating numerals from 1 to 12 equi-spaced about the periphery of said indicating means, a second aperture in said casing through which at least one of said numerals is always visible, means outside said casing for rotating said indicating means relatively to said control device to indicate the time of day at which the setting action is taking place, and means outside said casing for winding said clockworks by rotating said rotatable means and hence said indicating means until said indicating means indicates the time at which it is desired that the clockworks cease its operation.

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