

July 26, 1927.

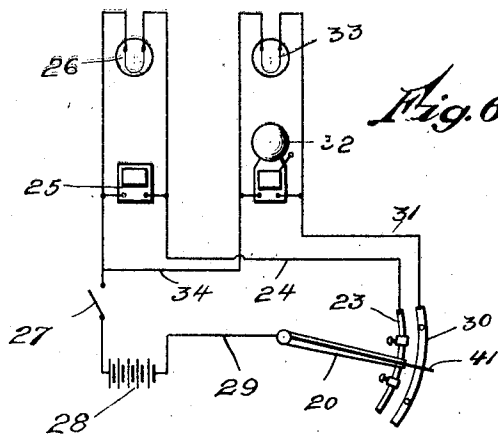
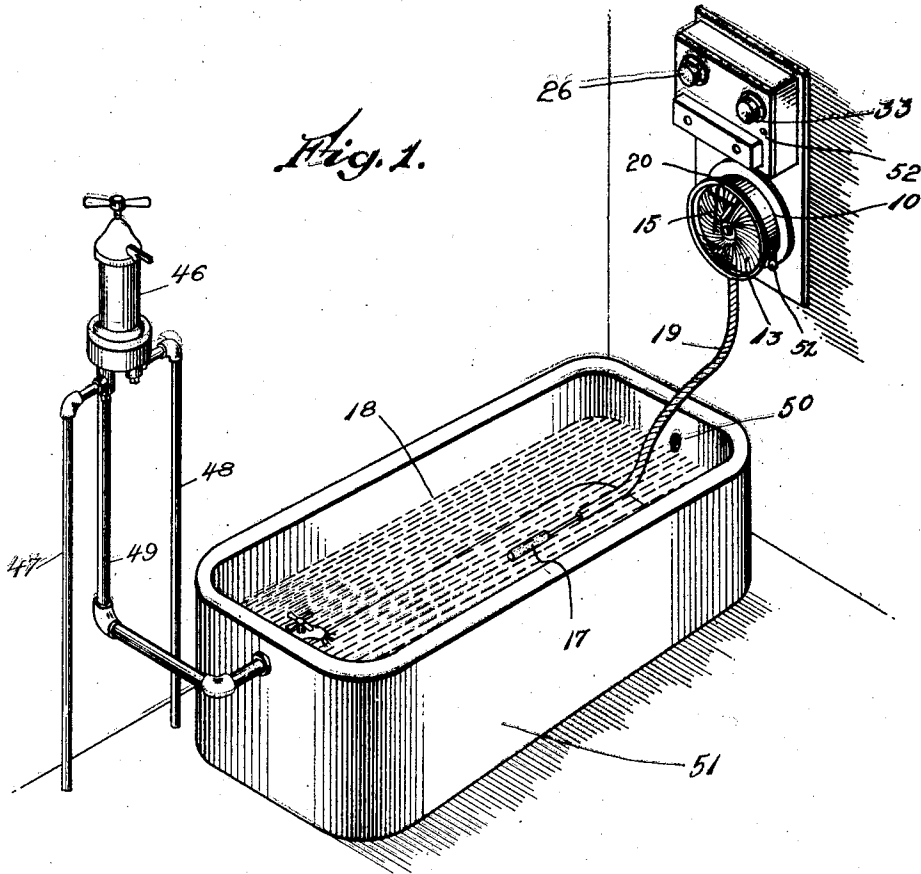
1,636,698

F. C. LEONARD ET AL

THERMALLY CONTROLLED SIGNALING DEVICE

Filed July 20, 1925

2 Sheets—Sheet 1



Frederick C. Leonard.
Charles W. Pietzel.
INVENTORS.

BY *Barlow & Barlow*
ATTORNEYS.

July 26, 1927.

F. C. LEONARD ET AL

1,636,698

THERMALLY CONTROLLED SIGNALING DEVICE

Filed July 20, 1925

2 Sheets-Sheet 2

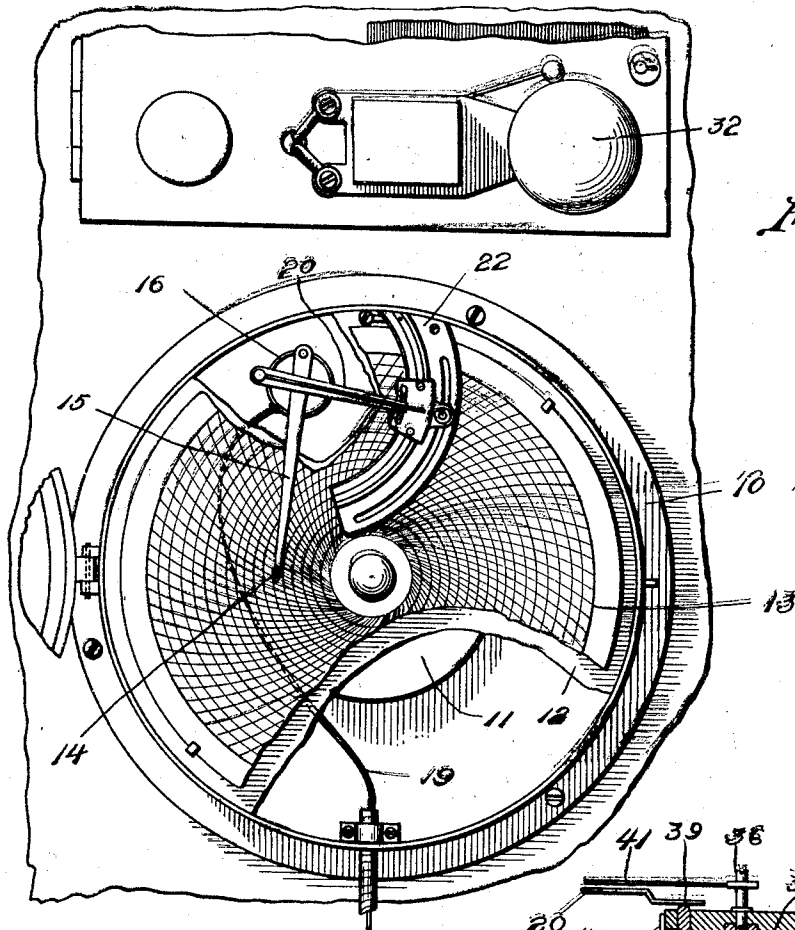


Fig. 2.

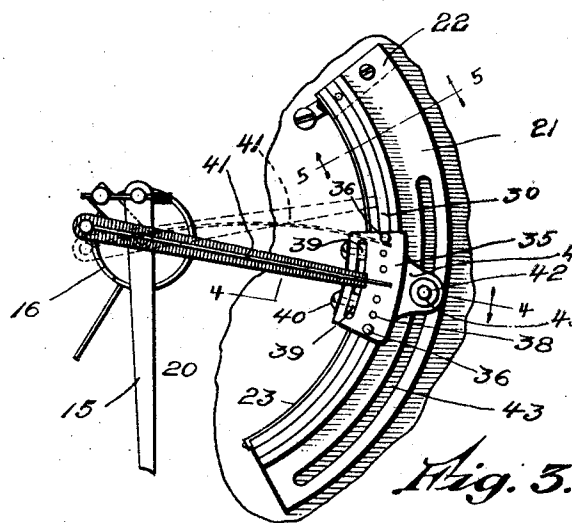


Fig. 3.

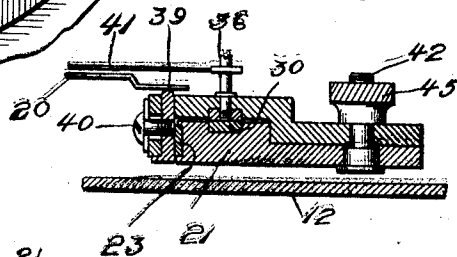


Fig. 4.

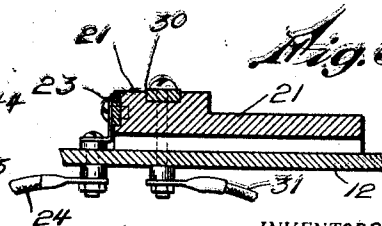


Fig. 5.

INVENTORS
Frederick C. Leonard
Charles W. Rietzel.
BY
Barlow & Barlow
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FREDERICK C. LEONARD AND CHARLES W. RIETZEL, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS TO LEONARD-ROOKE CO., OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

THERMALLY-CONTROLLED SIGNALING DEVICE.

Application filed July 20, 1925. Serial No. 44,945.

This invention relates to a thermally-controlled signaling device, and has for its object to provide warning and alarm signals to be operated upon by predetermined temperature changes of a medium, which it is desired should be maintained at a substantially constant temperature for an extended period of time.

A further object of this invention is to provide a signaling attachment for a recording thermometer, which is designed to operate in connection with a recording pen to control the action of the signaling elements, which signals may be either audible or visible, or both.

A still further object of the invention is the provision of a signaling attachment for a bath, which is designed to warn an attendant of predetermined high or low temperature changes and to sound an alarm upon excessive changes, either high or low of the bath.

The invention further consists in the provision of a pair of spaced electric contacts mounted on an adjustable element to be bodily moved and set in any desired position along the temperature scale, said contacts to be engaged by a contact arm moved in connection with the pen of a recording thermometer to engage said contacts to indicate high and low variations of the thermometer between the set positions of said contacts.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a perspective view showing the general arrangement of our thermally-controlled signaling device as applied to a hot-water bath.

Figure 2 is a front view partly broken away indicating the recording thermometer with a chart mounted on its face and showing the signal-controlling mechanism as arranged to operate in conjunction with the recording pen-arm.

Figure 3 is a front view illustrating the contact carrying plate and the circuit-clos-

ing arm as connected to the arm of the recording pen.

Figure 4 is a sectional elevation on line 4—4 of Figure 3, illustrating the adjustable contact plate.

Figure 5 is a section on line 5—5 of Figure 3, through the contact segment and showing the different circuit wires as connected to the different contact strips.

Figure 6 is a diagrammatic view illustrating two different electric circuits for the two different indicating signals, one being a warning and the other an alarm.

It is found in the treatment of mental or nervous diseases, that certain temperatures to which a patient is subjected, have a quieting effect on his nerves and accordingly a hydropathic bath has been devised for such treatments, which bath it is required should be maintained at that temperature to which the patient is found to more readily respond and various means may be employed for the maintaining of this bath temperature; among others being a so-called thermostatic mixing valve of the character described in Patent No. 1,476,718, dated December 11, 1923, for controlling and mixing hot and cold water to obtain the desired temperature thereof, but even by the use of the most modern mixing apparatus the temperature of the bath may under some conditions, change to such an extent as to affect the beneficial result of the treatment, thus the constant attention of an attendant is required to see that the desired temperature is maintained. In order that the physician in charge may have a chart record of the bath temperature for each patient treated, a recording thermometer is employed, and in order to attract the attention of the attendant in case of temperature variations between certain high and low limits, we have arranged warning and danger signals both visible and audible to be operated by mechanism connected to the recording instrument, whereby variations between certain limits are caused to operate the warning signal to attract the notice of the attendant and if not heeded and corrected further variations are caused to operate an alarm signal as an imperative demand for

immediate attention; and the following is a detailed description of the present embodiment of our invention showing one means by which advantageous results may be accomplished:—

With reference to the drawings, 10 designates the casing of a recording thermometer, in which is mounted a driving motor or clock mechanism in its casing 11 for rotating the chart-carrying plate 12 on which the chart 13 is mounted. Over this chart the usual recording pen 14 at the end of the pen-arm 15 is operated through a thermally-actuated coil 16 which is controlled in its action by the temperature of a bulb 17, herein shown as being located in a bath 18, the expansion of the heated gas in the tube 19 effecting a swinging movement to the recording pen-arm toward and from the center of rotation of the chart.

As it is found desirable in practice to operate the indicating signals in conjunction with the temperature-recording device to call to the attention of the attendant certain variations of temperature of a bath, between predetermined high and low points, we have mounted a contact arm 20 to work in conjunction with the recording arm 15 and have provided a contact segment 21 of insulating material, which is supported from one end 22 on the deck plate 12 to extend over the chart disc. This segment is provided with a guide strip 23 on its front edge to which a circuit wire 24 is connected and in which circuit is mounted an audible warning signal 25 and a visible warning signal lamp 26, the circuit being completed through a switch 27, battery 28, wire 29 and contact arm 20.

A second contact strip 30 is mounted on the upper face of the segment 21, which strip, as indicated in Figure 6, is connected by a circuit wire 31 and in which circuit is mounted an audible alarm signal 32 and a visible alarm signal 33, which circuit is completed through wire 34 and switch 27 to a flexible conductor member 41.

Mounted on this contact segment is a contact plate 35 which is provided with a pair of spaced high and low temperature contact posts 36 which may be adjusted relatively to each other and set in the different openings 38 in the plate 35 to vary the space between them, the contact posts having a sliding engagement with the contact strip 30; also in a slot in this plate 35 are mounted a pair of high and low temperature contacts 39 which may be adjusted by the slot toward and from each other by means of binding screws 40, see Figure 4.

The contact arm 20 is of a length to engage and slide with a wiping engagement over the contacts 39 and when so engaged an electric circuit is completed through the strip 23 to energize the warning signals both

visible and audible, and in order to sound an alarm signal upon further variation in case the warning signal is not heard or heeded by the attendant and the temperature of the bath corrected, we have mounted a flexible conductor member 41 to move in conjunction with the arm 20 and of a sufficient length to engage the post 36 in the alarm circuit so that when the arm 20 moves beyond its contact 39, this flexible member will engage one of the posts 36 to complete the alarm electric circuit through the strip 30 and ring the bell 32 and also illuminate a red lamp 33.

It will be noted that by forming this contact member very flexible the contact arm 20 is permitted to move a considerable distance beyond its contact and still maintain the alarm circuit closed until the attendant arrives and corrects the temperature of the bath.

This result is obtained by a movement of the contact arm in either direction to indicate that attention is required, if the water of the bath should become either too hot or too cold.

In order to secure this contact plate in adjusted position on the contact segment, we have provided a binding screw 42 which extends up through a slot 43 in the segment and through the ear 44 in the plate, whereby after this plate is moved to any desired position along the segment a nut 45 is set up to secure the plate against moving.

By this construction, it will be seen that an electric circuit may be made to operate the warning and alarm signals and even the contact arm may move some considerable distance beyond first engagement with the alarm contact without in any way disturbing their set positions and when the change in temperature is corrected by the attendant the contact arms automatically return to normal to again work between the contact points, without requiring any adjustment of the mechanism of the indicating or warning elements, all of which mechanism may be locked as at 52 so that it cannot be tampered with by the attendant or any unauthorized person.

The temperature of the constantly flowing water into the tub 51 may be controlled by any suitable means, but we have herein shown a so-called water mixing valve 46 which is fully described in the above mentioned patent, in which hot and cold water from the pipes 47 and 48 enter and are mixed in the thermally controlled valve and from here pass through pipe 49 into the bath tub 15 out through the overflow 50, which arrangement is designed to maintain constant temperature of the bath for the treatment of a patient with a nervous or mental disease, in which he remains a prolonged period of time of from three to

thirty-six hours, according to requirement. The temperature of this bath may, however, be changed somewhat from various causes such as change in pressure of the hot or the cold water, changes in temperature of the room and for other causes which necessitate certain checking-up devices, whereby such changes may be at once detected and regulated by the attendant and also such changes may be noted and a record of them kept, which is essential for the files of the general supervising physician in charge of the case, in noting the reactions of the patient.

We do not, however, wish to be restricted to the use of any particular means for regulating the temperature of the water as it flows into the tub as any means may be employed for this purpose, but it is the object of this invention to provide sensitive mechanism which will be operated quickly by slight temperature changes in the bath to operate the warning and alarm signals so that the attendant may rectify any extreme changes beyond predetermined points before it has detrimentally affected the patient undergoing this hydropathic treatment.

It is noted that all of the indicating and recording mechanism is securely locked against being tampered with by unauthorized persons so that those in charge may be sure of accurate operation of the parts.

We have herein described and shown an application of this signaling device as applied to a bath, but it is obvious that this warning and alarm mechanism may be employed for indicating predetermined temperature changes of any medium which it is desired should be maintained at a substantial constant temperature for any extended period of time.

It is to be understood that the term "bath" as used in the claims is intended to cover any medium to which this apparatus may be applied, whereby changes of temperature in that medium, may be indicated.

The foregoing description is directed solely towards the construction illustrated, but we desire it to be understood that we reserve the privilege of resorting to all the mechanical changes to which the device is susceptible, the invention being defined and limited only by the terms of the appended claims.

We claim:

1. In a signaling attachment for a recording device having a movable recording arm, a chart over which said arm operates, two pairs of spaced contacts, and contact means carried by said arm for engaging said pairs of contacts without appreciably affecting the operating movement of said arm for an indefinite range.

2. In a signaling attachment for a recording device having a movable recording arm, a chart over which said arm operates, a pair

of contacts, a contact arm carried by said indicating arm and positioned to have abutting engagement with either of said contacts, said contact arm being yieldable whereby movement of said indicating arm is appreciably unaffected.

3. In a signaling attachment for an indicating device having a movable indicating arm, a pair of contact arms carried by said indicating arm, a plurality of contacts positioned to be successively engaged at different positions of the operating movement of said indicating arm by different arms of said pair of contact arms.

4. In a signaling attachment for an indicating device having a movable indicating arm, a pair of contact arms carried by said indicating arm, a contact positioned in the path of one of said arms to be engaged thereby and disengaged upon further movement of the arm, and a second contact insulated from the first and positioned to be engaged by the other of said contact arms upon the disengagement of the first contact with its contact arm.

5. An attachment for an indicating device having a movable indicating arm comprising a support fixed relative to said indicating arm, two pairs of spaced contacts on said support, a pair of arms mounted on said indicating arm and movable therewith and each adapted to engage with but one of said pairs of contacts, the functional engagement between said contacts and arms being such that the movement of said indicating arm is unaffected.

6. An attachment for an indicating device having a movable indicating arm comprising a support fixed relative to said end arm two pairs of spaced contacts on said support, a contact arm carried by said indicating arm and positioned to have a wiping engagement with either of one of said pairs of contacts, a second contact arm positioned to have positive abutting engagement with either of the other of said pairs of said contacts, said second contact arm being yieldable whereby movement of the indicating arm is not affected by its engagement with its contact.

7. A signaling attachment for a recording device having a movable pen arm comprising a relatively fixed segment shaped support, a pair of conducting bus bars insulated from each other carried thereby, a contact plate slidably mounted on said support, means for securing said contact plate in different positions relative to said support, two pairs of spaced contacts carried by said plate, one pair having engagement with one of said bus bars and the other pair having engagement with the other of said bus bars, said contacts being adjustable on said plate to secure different spacings thereof, a contact arm carried by said pen arm and posi-

tioned to have wiping engagement with either of one pair of said contacts, a second contact arm surmounting and carried by the first contact arm and having positive abutting engagement with either of the other of said pair of contacts, said second contact arm being resilient and yieldable whereby

the movement of the pen arm is not affected by engagement with the contacts.

In testimony whereof we affix our signatures. 10

FREDERICK C. LEONARD.
CHARLES W. RIETZEL.