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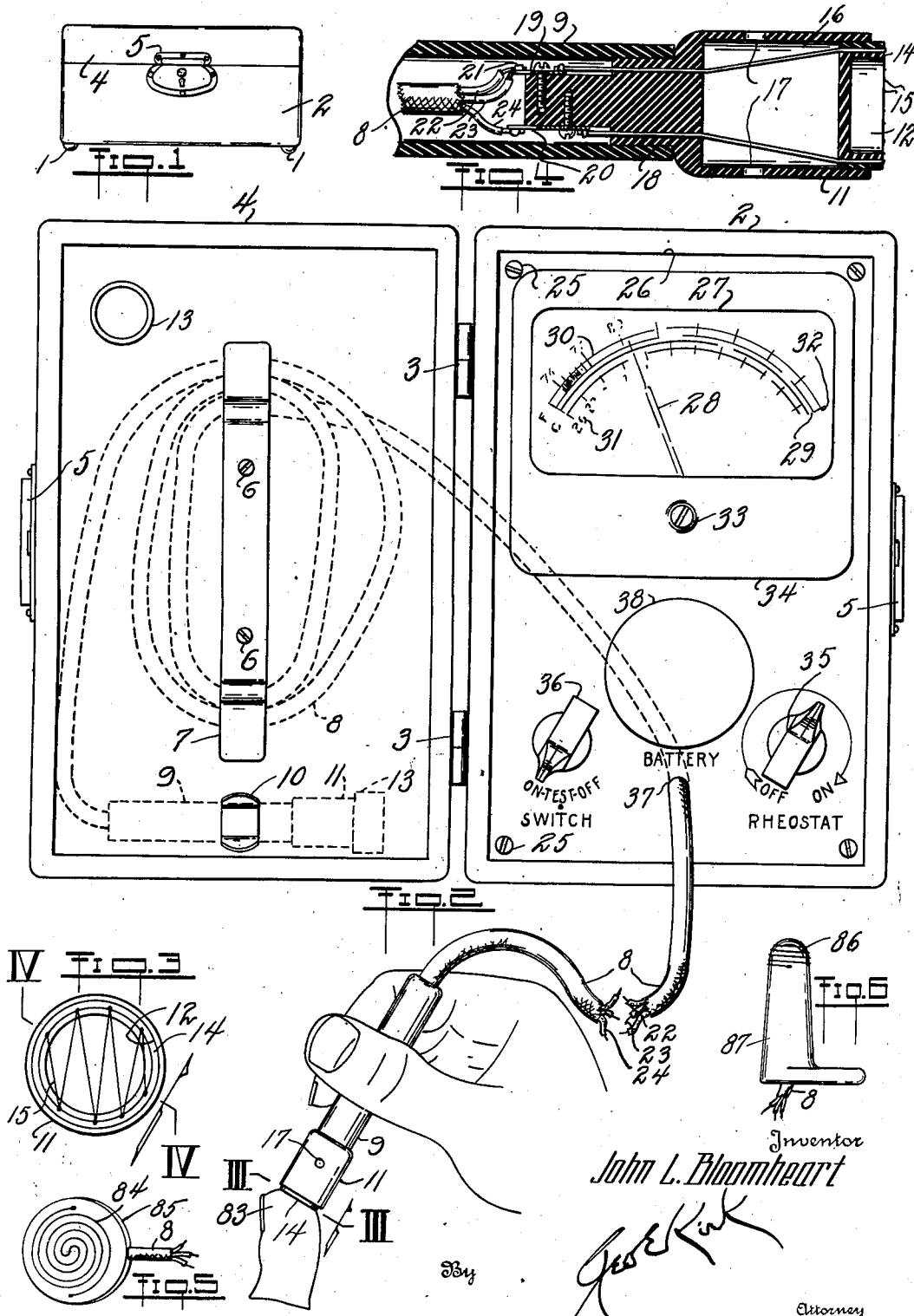
J. L. BLOOMHEART

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CONTACT THERMOMETER

Filed April 22, 1938

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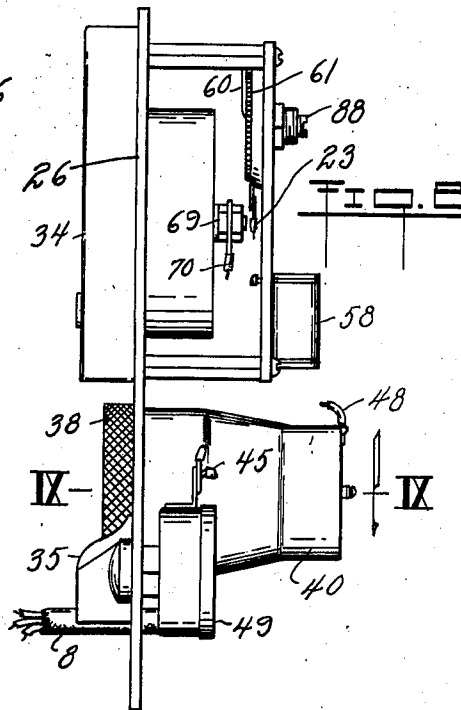
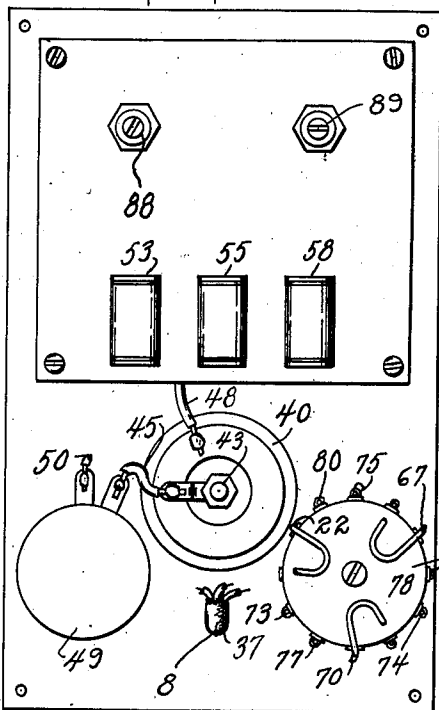
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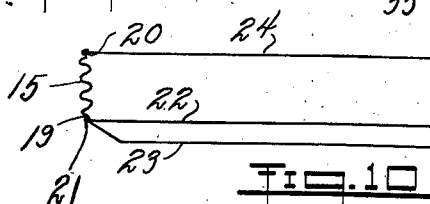
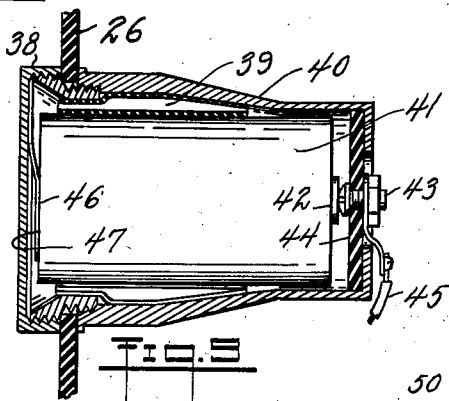
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VIII

Fig. 7



VIII



334

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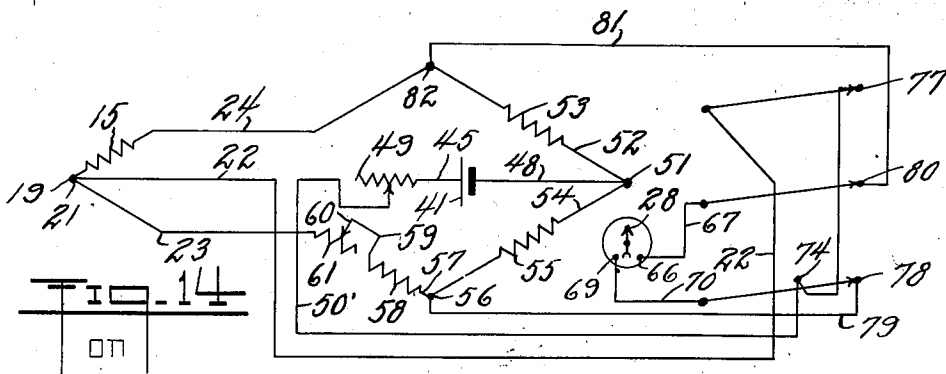
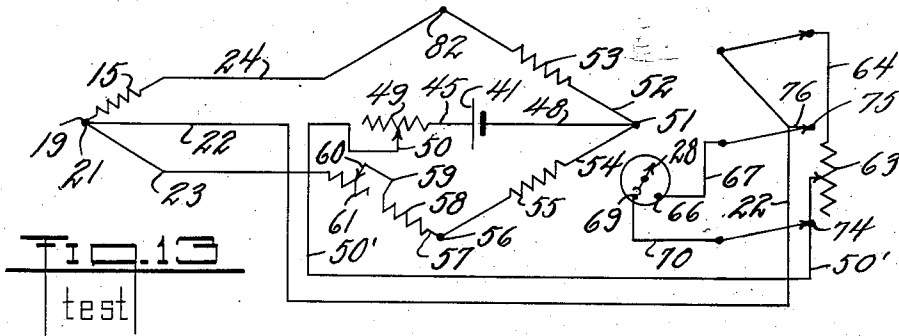
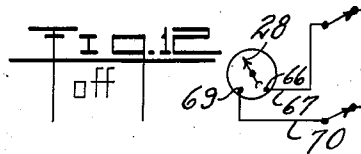
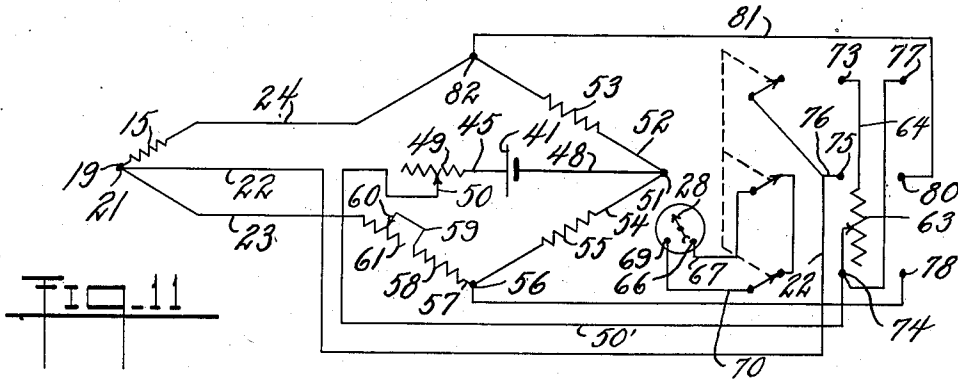
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,195,019

CONTACT THERMOMETER

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mesne assignments, to Martha F. McKesson,
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Application April 22, 1938, Serial No. 203,617

2 Claims. (Cl. 73—362)

This invention relates to a diagnostic aid in therapeutic activities as to the skin, orifice, or cavity for a condition of control and a temperature control of a patient.

This invention has utility when incorporated in a thermally responsive element in an electric circuit. Such element is readily located at a suspected region for an indicating instrument to disclose a temperature condition.

Referring to the drawings:

Fig. 1 is a side elevation of a portable set-up for the device herein;

Fig. 2 is a view looking into the opened cabinet or container of Fig. 1, showing the tool or applicator as directed therefrom;

Fig. 3 is a view on the line III—III, Fig. 2, looking into the contact end of the tool or applicator;

Fig. 4 is a longitudinal section of the tool or applicator on the line IV—IV, Fig. 3;

Fig. 5 is a thin or disk type of tool which may be used instead of the handle type of Fig. 2;

Fig. 6 is a modified arrangement for the contact, adapted for insertion in an orifice, and is of the general suppository type;

Fig. 7 is a view from the rear of the right hand portion of Fig. 2, showing the electrical instruments;

Fig. 8 is a side elevation of the electrical instruments on the line VIII—VIII, Fig. 7;

Fig. 9 is a section through the cup or pocket for the energy source or dry cell on the line IX—IX, Fig. 8;

Fig. 10 is a wiring diagram for the electrical equipment of Fig. 7, approximating the grouping of Fig. 2;

Fig. 11 is a more compact layout of the wiring as in Fig. 10;

Fig. 12 is a detail of wiring circuit at "off" position of the control switch;

Fig. 13 is the wiring circuit at "test" position of the control switch; and

Fig. 14 is the wiring circuit at "on" position of the control switch.

Cushion knobs 1 (Fig. 1) serve as legs for a container 2 in the form of a cabinet or box having hinges 3 (Fig. 2) and a lid 4 having a latch 5. In the lid or cover 4, screws 6 mount a hook strip 7, about the extension ends of which may be wrapped a conduit 8, terminally carrying a handle 9. This handle 9 is adapted to be engaged by snaps 10 fixed with the lid 4. The handle 9 mounts an applicator tool 11 having an open end 12, which, in an out-of-use position, may be covered by a cap 13.

In the open end 12 is a cup 14 (Fig. 4), across

an open outer end of which may zig-zag an electrical wire 15 of high temperature-coefficient resistance, the ends of which extend through a chamber 16 and a plug 18 into the handle 9. The chamber 16 is provided with vent openings 17. The conductor 15 has terminals 19, 20. The terminal 19 connects to a second junction 21 (Fig. 10) between wires 22, 23, and the terminal 20 connects to a conductor wire 24 for extending through the conduit 8.

In the container or major section of the cabinet 2, screws 25 (Fig. 2) mount a plate 26. The plate 26 has a window 27 exposing a galvanometer needle 28. The needle 28 is movable across a scale 29. The scale 29 has Fahrenheit readings 30 and adjacent thereto Centigrade readings 31. A limit region 32 is provided for throw of the needle 28 to the right for "test" position. An adjusting screw 33 is provided for the indicating instrument on a panel portion 34.

A handle 35 is near the lower right hand corner of the plate 26. The handle 35 is rockable as an adjustable control for the rheostat for the energy source in the use of the instrument. A manually operable handle 36 is at the lower left corner. The handle 36 is for cutting in the instrument from "off" position to "test" and "on" positions as indicated. Between these handles 36, 35, there is an opening 37 for the conduit 8 to connect up the electrical apparatus back of this plate 26 with the tool 11. A screw cap 38 is toward the indicating instrument and between the manually operable handles 35, 36 (Figs. 8, 9). This cap 38 has therein a corrugated insulation cushion 39 in a metal pocket 40 to receive a dry cell 41, say as a flashlight battery. This cell 41 has a terminal 42 with a contact therefor at a central base terminal 43 having an insulation mounting 44 in the bottom of the pocket 40. A conductor line 45 extends from the terminal 43.

The screw lid or cap 38 has a spring terminal 46 to contact a terminal 47 of the dry cell 41 in completing the placing of this dry cell in a circuit with a line 48 (Fig. 10). The line 45 extends to a resistance 49 having an adjustable contact 50 operable by the handle 35 of the rheostat.

The line 48 extends to a first junction 51 of a Wheatstone bridge. The bridge has a leg 52 with a resistance 53 therein, and a leg 54 with a resistance 55. The leg 54 extends to a fourth junction 56 and is there connected to a fourth leg 57, a resistance 58, and a conductor 59 to an adjustable terminal 60, a resistance 61 to the conductor 23. A line 50' connects the adjustable

contact 50 with a terminal 62, a resistance 63, and a line 64.

A galvanometer 65 has a terminal 66 from which extends a conductor 67 to an arm 68 of the manually operable switch 36. The galvanometer 65 has a terminal 69 from which extends a conductor 70 to a movable arm 71 fixed with the manually operable handle 36. The two sides of the indicating instrument or galvanometer are thus connected to a manually operable control switch. The control switch has an arm 72 connected to the line 22. At "off" position the galvanometer is shorted out of circuit. A shifting of this manually operable switch 36 would be from "off" position, with the galvanometer and battery out of active circuit connection, to test position for the galvanometer to disclose the condition of the circuit in use in Fig. 2. This first shifting (Figs. 10, 13) brings the arm 72 to a terminal 73 in connecting the conductor line 64 through the adjustable resistance 63, the terminal 62 and the line 50' to the terminal 50. At the manually operable rheostat handle 35 the adjustable resistance 49, now in series with the dry cell 41, may thus be operated to bring the galvanometer needle 28 to the "test" position 32. This test thus serves to check up the reading of the galvanometer for the condition of the battery. At the shifting of the arm 72, the arm 71 is brought to a terminal 74, thereby connecting the lines 70, 50', at one side of the galvanometer 65 into the energy circuit. The arm 68 from the line 67 is at the same time shifted to a terminal 75 and by a line 76 there is a connection to the conductor line 22. These three switch contacts, as made, place the galvanometer in circuit. The more readily adjustable manually operable rheostat 49 may now be positioned to bring the needle to "test" position 32 on the scale 29.

After the mid-position of testing adjustment, the manually operable switch 36 brings the arm 72 into the position of "on" at the terminal 77 (Fig. 14) connected to the conductor 50'. Simultaneously, the arm 71 is brought to a terminal 78 having a conductor connection 79 with the junction 55 of the bridge. The same "on" position of the switch handle 36 brings the arm 68 to a terminal 80 having a conductor connection 81 to a third junction 82 at the bridge opposite the junction 56.

The tool may then be applied to the tip of a digit 83 (Fig. 2), at places on the face, or about the body of a person. Immediately there is a response in a shifting of the needle, which may show a condition of a chill, if low; may show a normal condition; or may show a condition of fever. The response is a direct swinging, but not a free oscillation, of the needle 28. It is a direct, non-sluggish movement to operative position. There is absence of an oscillatory swinging. This gives a response as to whether or not there be a lack of circulation or a nourishment for the particular flesh contacted, or whether there be an abnormal heat condition, say due to an infection, an irritation, or other disturbing factors.

In fact, in the set-up herein, a safeguarding, when a treatment is in process, may be effected, say for instance with an electric heater or a so-called diathermic treatment. As such may be in the form of a wrapping adapted similar to a poultice or a pad, it is in order to have, in lieu of the resistance 15, a resistance 84 in a holder 85 (Fig. 5).

Again, when there be an occasion to have the tool function say in a human cavity, a resistance

86 (Fig. 6) may be as a wrapping about a mounting 87 in adapting to such use.

The resistance 61 with its adjustable terminal 60 may be manually controlled by a tool at a screw 82 (Fig. 7). The resistance 63 with its adjustable terminal 62 may have such resistance manually controlled at a screw 89. These screw adjustments are less readily effected than the operation of the handle 35, or these may be adapted more readily to cooperate for positioning the needle 35 in less than its extreme position for more sensitive operation within the range therefor.

This contact thermometer has a clinical application readily to superficial areas, as to the skin of the patient. It is adapted under a special tool for the exploration of an orifice as to disturbances. Physical ailments or diseases, whether primarily in the nerves or otherwise, react on the blood flow or the circulatory system in the veins as well as the arteries. These disturbances away from a normal condition directly disclose in the proximate flesh or the skin region a departure from that temperature which should otherwise be normal therefor.

The step for a diagnostic value is of a continuing importance. The following and corrective measures may be taken: an administered medical dosage, a diet, or by poultices, a diathermic treatment, a massage, an exertion, or other form of clinical treatment or care. The effectiveness of such course may be reliably checked as to whether or not there be resulting aggravation. If such be the end sought or if there be such a tendency, then it is in order for the attendant to take due corrective means. The tool of the disclosure herein does not tend to aggravate nor promote a departure from the area under check. The contact portion as superficial is not a one tending to congest the region but allows functioning as may be normal for a skin.

What is claimed and it is desired to secure by Letters Patent is:

1. In a temperature measuring apparatus, a Wheatstone bridge including an applicator tool having a high temperature-coefficient resistance as a first leg thereof, a fixed resistance in each of two legs forming a second and third leg thereof having a first junction therebetween, a fixed resistance and a variable resistance in series with each other, constituting the fourth leg of the bridge adapted to have a second junction with the tool, there being a third junction between the first and second legs, a fourth junction between the third and fourth legs, a source of electric energy having one side connected to the first junction, two variable resistances connected in series with each other and the other side of said energy source, a galvanometer for the bridge, circuit arrangements for the bridge in association with a multi-throw switch having an "off" position at which the energy source is ineffective, having a "test" position at which the two variable resistances in series are in circuit from the second junction for adjusting the energy source with the galvanometer, and having an "on" position in which the energy source and one of said two variable resistances are in series between the said first and second junctions and the galvanometer is connected between the third and fourth junctions of the bridge.

2. In a temperature measuring apparatus, a Wheatstone bridge including an applicator tool having a high temperature-coefficient resistance as a first leg thereof, a fixed resistance in each

of two legs forming a second and third leg thereof having a first junction therebetween, a fixed resistance and a variable resistance in series with each other, constituting the fourth leg of the
5 bridge adapted to have a second junction with the tool, there being a third junction between the first and second legs, a fourth junction between the third and fourth legs, a source of electric energy having one side connected to the first
10 junction, two variable resistances connected in series with each other and the other side of said energy source, a galvanometer for the bridge, circuit arrangements for the bridge in association

with a three pole switch having three positions of throw, one, an "off" position at which the energy source is ineffective, two, a "test" position at which the two variable resistances in series are in circuit from the second junction for adjusting
5 the energy source with the galvanometer, and three, an "on" position in which the energy source and one of said two variable resistances are in series between the said first and second junctions and the galvanometer is connected between the
10 third and fourth junctions of the bridge.

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