July 8, 1930. C. H. KUHLMAN 1,770,000

TELETHERMOMETER CONTROL

Filed March 7, 1922 2 Sheets-Sheet 1

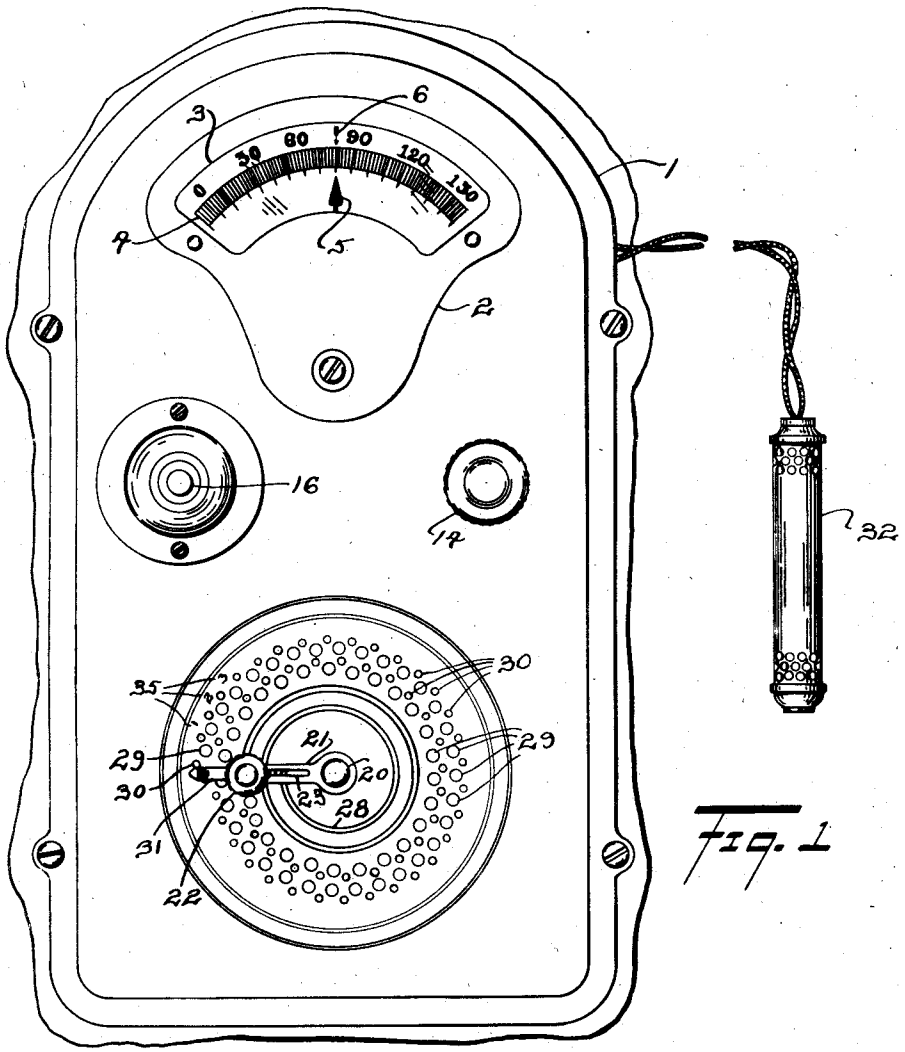


FIG. 1

FIG. 2

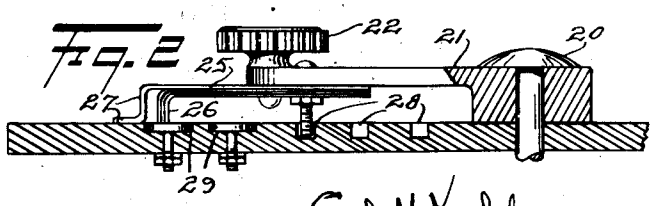
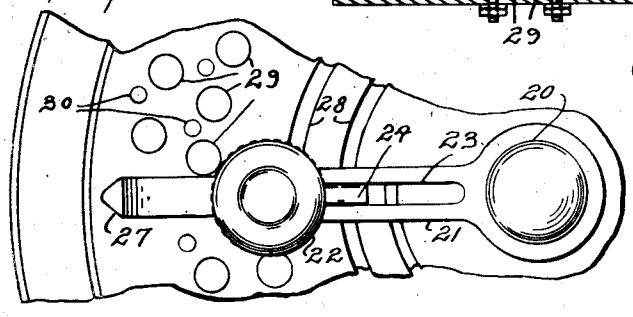


FIG. 3



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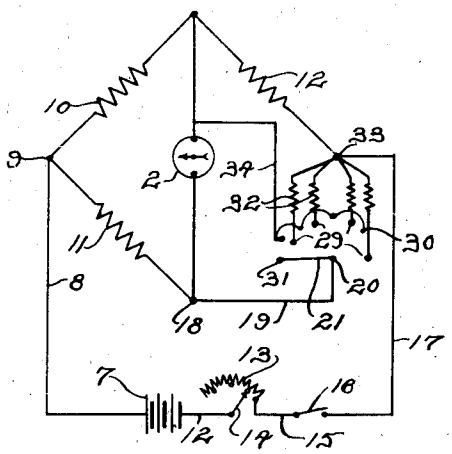


Fig. 4

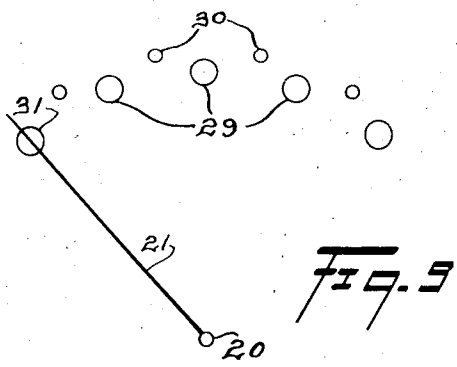


Fig. 3

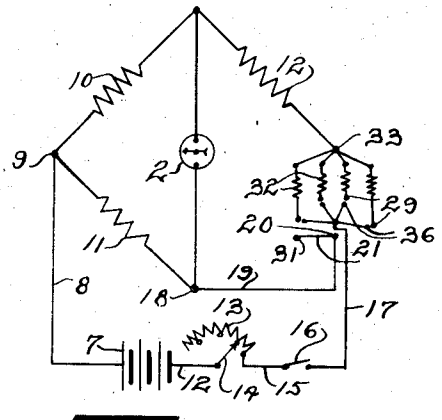


Fig. 5

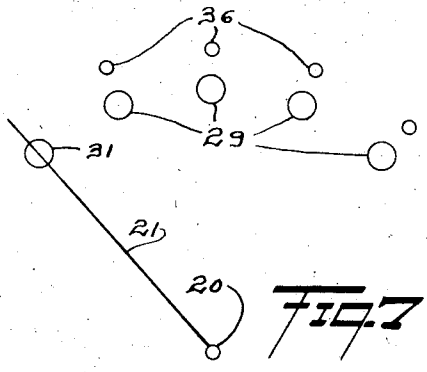


Fig. 7

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UNITED STATES PATENT OFFICE

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TELETHERMOMETER CONTROL

Application filed March 7, 1922. Serial No. 541,756.

This invention relates to mechanism for obtaining different readings or indications.

This invention has utility in selecting connections for different readings or indications of a galvanometer, as in telethermometers.

Referring to the drawings:

Fig. 1 is a front elevation of a telethermometer central station instrument, parts being broken away;

Fig. 2 is a detail view partially in section of a control handle or multi-throw switch arm;

Fig. 3 is a plan view of the arm of Fig. 2;

Fig. 4 is a wiring diagram of an embodiment of the invention as shown in Fig. 1;

Fig. 5 is a partially diagrammatic showing of the two series of contacts;

Fig. 6 is a wiring diagram wherein the supplementary or safety contacts are disposed in alignment with the different positions of the multi-throw switch; and

Fig. 7 is a partial diagram of the multi-throw switch.

The telethermometer central station is shown as provided with front plate 1 as a general housing wherein is disposed galvanometer 2 having window 3 back of which is disposed scale 4 along which may move indicating needle 5 from a central or off position 6. This central station may house an energy source as dry cells 7 connected by line 8 to terminal 9 of Wheatstone bridge having resistances 10, 11, which Wheatstone bridge has two legs thereof connected by the galvanometer 2. Resistances 12 may form the third leg of this Wheatstone bridge. From the energy source 7 may extend line 12 to resistance 13 as controlled by rheostat arm 14. Line 15 from this rheostat may extend to switch 16 as a push button for closing the circuit to line 17 connected to the leg 12.

The fourth leg of this bridge may be the one wherein the resistances to be read are disposed. Terminal 18 to which resistance 11 and galvanometer 2 are connected, has line 19 therefrom to central bearing 20 which mounts arm 21 carrying handle 22. This arm 21 is shown as provided with slot 23 serving as a guide for rib 24 in holding radially with this arm 21 arm section or extension 25 carrying laminated terminal 26 as a first or major terminal, and supplemental or secondary terminal 27 therebeyond.

In the adaptation of the central station telethermometer for a plurality of readings, in some instances the number of stations to be served becomes quite considerable, in fact run into the hundreds, and to have a single control arm for such stations there has been developed this extensible arm and the contacts disposed in a spiral series. To insure proper placing of the terminal 26 radially as to its contact, there is developed from this central bearing 20 a spiral having an inner guide portion 28 and an outer portion having contacts 29 as a first series, with intermediate contacts 30 as a second series. The contacts 29 are disposed for completing circuit with terminal 26 of the multi-throw switch arm or controller, while the contacts 30 are for engagement by the secondary terminal 27. The controller 25 in placing the contact 26 from energy off position contact 31 to first reading contact 29, serves to connect resistance 32, say a thermosensitive element at a remote place connected to terminal 33 having connection with the line 17 and the resistance 12, in thus completing the Wheatstone bridge for a reading or indication by the galvanometer 2.

In shifting the controller by the handle 22 before the terminal 26 engages the contact 29, the terminal 27 engages contact 30, and through line 34 by-passes the galvanometer 2. Accordingly, as this handle 22 is shifted to bring the terminal 26 into reading position upon the contact 29, there is no occasion for having the terminal 26 bridge pairs of contacts 29 or otherwise effect excessive current flow in the instrument 2, which might tend to abnormally throw the needle 5, and thus tend to pound the needle against a terminal or otherwise destroy the sensitiveness or accuracy of the galvanometer.

This by-passing cut out by these contacts 30 occurs or is in position between each pair of the major contacts 29. In the event the handle 22 is left at some intermediate position instead of upon the dead starting contact 31, there is not a tendency to run out the

energy source of battery 7 unless the push button 16 is held closed.

In the manipulation of this instrument, the operator may with one hand hold the push button 16 closed and with the other take consecutive readings at the various rooms or remote points as desired, which remote points may be identified by characters 35 placed adjacent the contacts 29.

A similar effect to by-pass the galvanometer 2 to avoid these impacts or concussions for the needle 5 is obtained by having minor contacts 36 in alignment with the major contacts 29 so that the narrowed or pointed end of the terminal 27 is in position to complete the circuit with the line 17 only when the position of the terminal 26 is central of the contact 29. Accordingly, as the arm is shifted between the contacts 29 at once shifting starts the terminal 27 leaves the contact 36 and the larger terminal 26, even if it be of an extent to approximate bridging between the larger contacts, 29 may not effect any throwing of the galvanometer, because the terminal 27 has cut out such galvanometer.

These features of galvanometer safety permit of the massed association of the terminals and still make possible the accuracy of reading with elimination of disturbances which might objectionably affect the sensitive galvanometer instrument.

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

1. A switch for a plurality of circuits embodying a pivoted arm provided with an adjustable extension, a guide as to which the arm is movable for adjusting radially the shifted arm and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, and contacts with which the adjusted arm may engage for connecting said switch in different circuits.

2. A switch for a plurality of circuits embodying a pivoted arm provided with a slidable extension, a bearing for the arm, a guide of spiral form extending about the bearing and as to which guide the arm is movable on its bearing, said guide coacting for positively shifting the extension radially as said arm is moved on its pivot and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, and a spiral series of contacts to be engaged at different positions of the arm for connecting said switch in different circuits.

3. A switch for a plurality of circuits embodying a pivoted arm provided with a radially slidable extension, a spiral having an inner guide portion coacting for positively shifting the extension radially as said arm is moved on its pivot and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide portion, and an outer portion providing a series of contacts to be engaged at different positions of the arm for connecting said switch in different circuits.

4. A switch for a plurality of circuits embodying a pivoted arm provided with a radially slidable extension, a spiral having an inner guide portion coacting for positively shifting the extension radially as said arm is moved on its pivot and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide portion, an outer portion providing a first series of contacts to be engaged at different positions of the arm for connecting said switch in different circuits, and an additional series of contacts disposed in said outer portion of the spiral for coacting with the arm.

5. A control switch plate embodying a central bearing, a switch arm swingable from said bearing as a pivot, said arm having a radially extensible section, a spiral about said bearing providing a guide coacting for positively shifting the extensible section radially during swinging of the arm and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, and a terminal carried by the extensible section, said spiral having an outer portion provided with contacts for a plurality of circuits to be engaged by said terminal for connecting said terminal in different circuits.

6. A control switch plate embodying a central bearing, a switch arm swingable from said bearing as a pivot, said arm having a radially extensible section, a spiral about said bearing providing a guide coacting for positively shifting the extensible section radially during swinging of the arm and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, and terminals carried by the extensible section, said spiral having two series of contacts for a plurality of circuits one of which series is in the outer portion thereof, said contacts being disposed to be engaged by said terminals for connecting said terminals in different circuits.

7. A controller embodying a switch arm providing a terminal, a spiral guide for shifting the terminal and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, and circuit contacts to be engaged by the terminal in placing said terminal in a selected circuit.

8. A controller embodying a switch arm providing terminals, a spiral guide for shifting the terminals and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide, a first series of contacts for

different circuits, and a second series of contacts to be engaged by the other terminal.

9. A controller comprising an arm having two terminals, for a single conductor line connected thereto, circuit means including a contact for one of said arm terminals for effecting its connection for a selected circuit, and a spiral guide effective in arm rotation for radially shifting said terminals and precluding radial shifting of the arm except as brought about by swinging the arm on its pivot for coacting with said guide.

10. A controller embodying a multi-terminal member having contacts for a plurality of circuits to be engaged by a first controller terminal for connecting in different circuits, and a circuit portion by-passing second controller terminal and from the first controller terminal coacting only between contact positions of the first controller terminal.

11. A controller embodying multi-position first and second terminals, first contacts for a plurality of circuits to be engaged by the first terminal for connecting in different circuits, and circuit portion by-passing means including intermediate contacts only between positions of the first contacts to be engaged by the second terminal.

12. A controller having a multi-position arm provided with a plurality of terminals, two series of contacts for said terminals, the contacts of one of said series being effective at a position of the controller for different circuits with the other series ineffective, and said other contacts through said terminals being effective for by-passing a portion of said circuits.

In witness whereof I affix my signature.

CARL H. KUHLMAN.