

March 16, 1937.

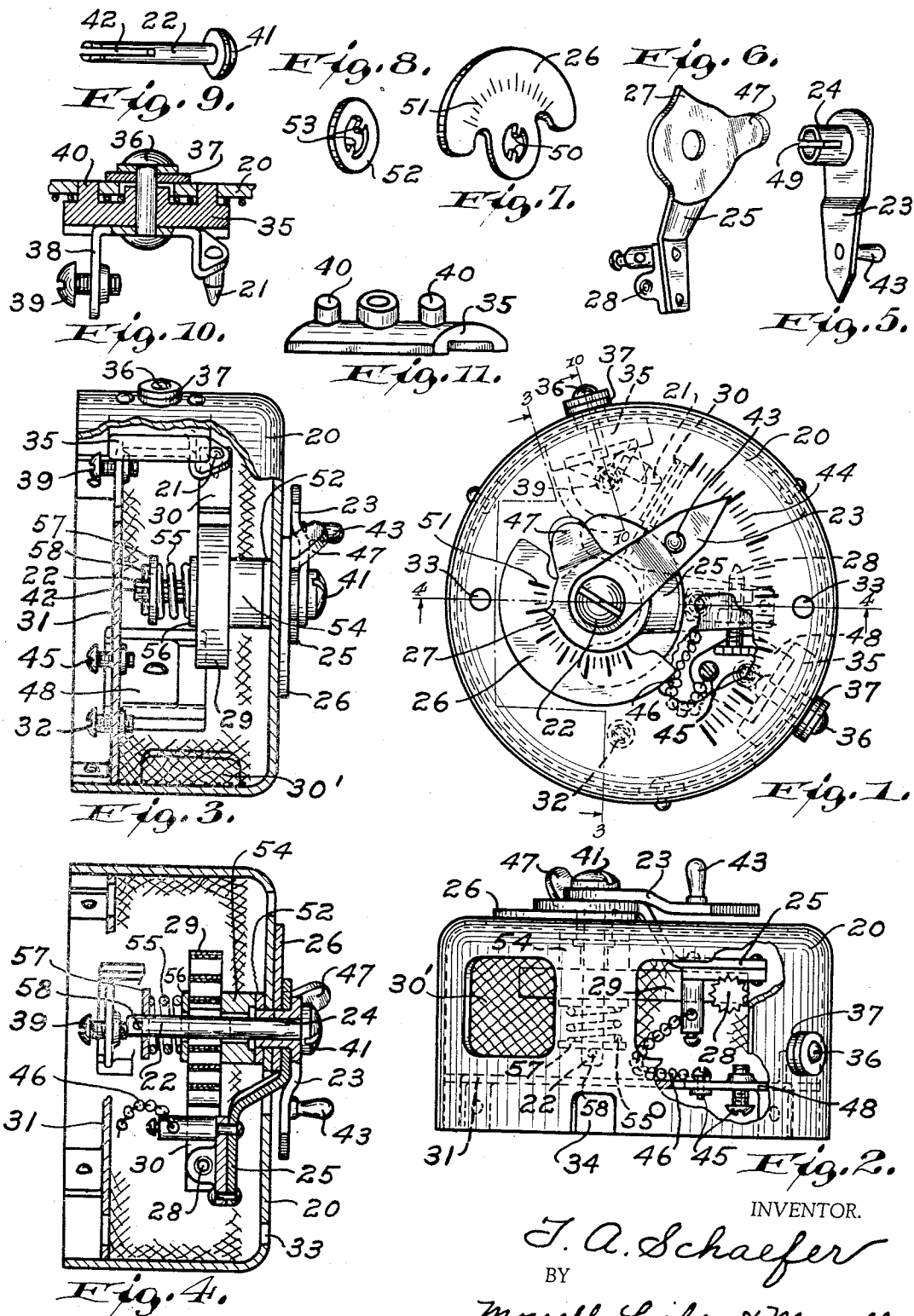
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2,073,757

THERMOSTATIC SWITCH

Filed Dec. 11, 1933

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

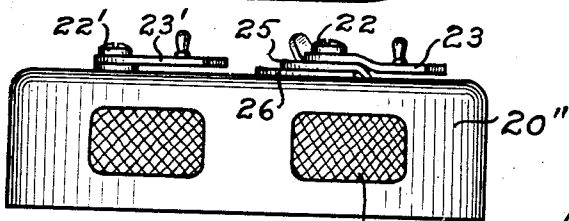
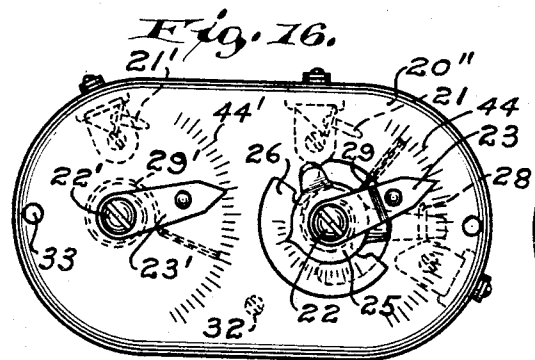


Fig. 17.



Fig. 12.

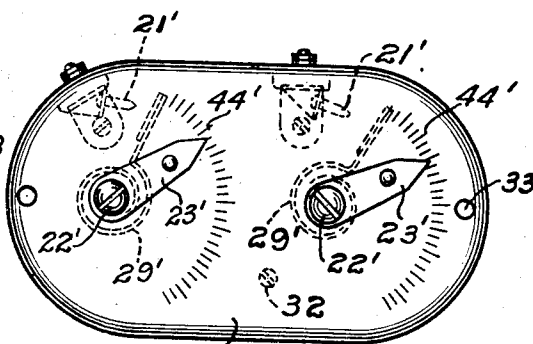


Fig. 18.

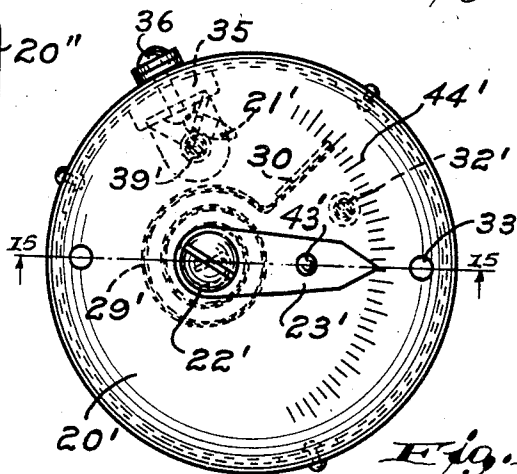


Fig. 13.

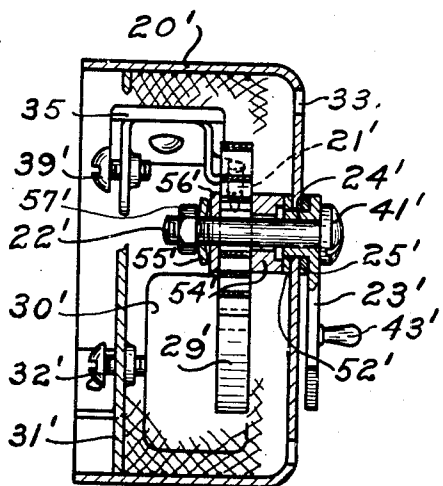


Fig. 15.

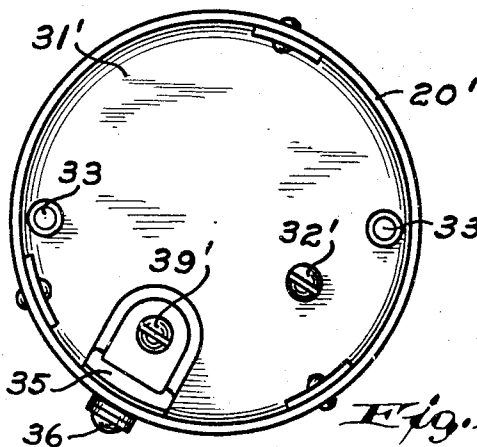


Fig. 14.

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2,073,757

THERMOSTATIC SWITCH

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Application December 11, 1933, Serial No. 701,791

12 Claims. (Cl. 200—139)

The present invention relates in general to improvements in the construction and operation of thermostatic switches of the type adapted to automatically either complete or interrupt an electric circuit in accordance with variations in thermal conditions.

Generally defined, an object of the invention is to provide an improved thermostatic switch which is simple and compact in construction, and which is moreover highly effective in actual use.

It has heretofore been proposed as shown and described in my Patent No. 1,942,664, granted January 9, 1934, to provide a thermostatic switch especially adapted to automatically close the electric circuit of a fire alarm system, said switch comprising a base having a normally fixed contact thereon, an adjusting arm pivotally associated with the base, and a spirally wound thermostatic element pivotally adjustably associated with the arm and having a contact portion movable toward or away from the fixed contact to make or break the electric circuit. While this prior switch mechanism has proven highly successful in actual commercial use, it is of relatively complicated construction, and also to some extent lacks sufficient flexibility when utilized for diverse purposes other than the use specifically mentioned hereinabove.

It is therefore a more specific object of the present invention, to provide an improved switch structure operable by changes in temperature of an ambient medium, which besides being extremely simple and durable in construction, is also highly flexible in operation.

Another specific object of the invention is to provide new and useful thermostatic switch mechanism adapted for efficient use in high and low limit temperature control systems, as well as in alarm systems, whereby sensitive and accurate control may be quickly and conveniently effected.

A further specific object of the invention is to provide simple and effective instrumentalities for normally effecting accurate and rapid adjustment of the range of operation of a thermostatic switch in response to temperature changes, without utilizing screw adjustments or tools of any kind.

Still another specific object of the invention is to provide improved thermostatic switch structure which can be manufactured and installed at minimum cost, and which requires minimum attention in order to maintain the same in operative condition.

An additional specific object of the invention is to provide a compact and highly attractive thermostatic switch which is protected against

tampering, and which can be quickly set to respond accurately to any desired high or low setting.

Another specific object of the invention is to provide an improved thermostatic control switch adapted to cover a very large range of temperature variations, so that extremely high and low ranges of temperature control are made possible in a single device, thereby eliminating the necessity of utilizing two or more switches for the desired purpose, as with the prior art devices.

A further specific object of the invention is to provide simple and effective means for permitting changes in either the high or the low temperature setting, without in any manner affecting the setting or accuracy of setting of the other. For example, if the low temperature control arm is set at 50°, and a change of from 70° to 90° is desired in the high temperature control arm setting, such change in the high temperature setting may with the improved mechanism, be readily and conveniently effected without disturbing the low temperature setting in any manner. This cannot so far as known, be accomplished in unit thermostatic switch structures of the prior art wherein changes in the low or high temperature control settings, will necessarily affect the accuracy in setting of the control which it is desired to leave unaffected, thus preventing accurate and independent changes in the high and low limit settings.

Still another specific object of the invention is to provide an improved base structure for thermostatic switches, whereby a durable support may also be utilized as a protecting housing for one or more switch units.

An additional specific object of the invention is to provide various improvements in the details of construction of thermostatic switch mechanisms whereby such mechanisms may be utilized either singly or in multiple, in conjunction with a minimum number of terminal connections and a common base which may also serve as an enclosure for the mechanism.

These and other objects and advantages will be apparent from the following detailed description.

A clear conception of several embodiments of the invention and of the mode of constructing and of utilizing thermostatic switches built in accordance with the improvement, may be had by referring to the drawings accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views:

Fig. 1 is a front elevation of a high and low

temperature single thermostatic switch, having a portion of the housing base broken away to show internal structure;

Fig. 2 is a side elevation of the switch of Fig. 1, likewise having a portion of the housing base broken away to reveal internal structure;

Fig. 3 is a section through the switch taken along the irregular line 3—3 of Fig. 1;

Fig. 4 is another section through the switch, taken along the line 4—4 of Fig. 1;

Fig. 5 is a perspective view of the high temperature adjusting member or arm of the switch shown in Figs. 1 to 4 inclusive;

Fig. 6 is a perspective view of the low temperature adjusting member or arm of the switch;

Fig. 7 is a perspective view of the dial or gage plate carried by the high temperature adjusting arm and cooperating with the low temperature adjusting member;

Fig. 8 is a perspective of the clamping washer coacting with the high and low temperature adjusting members to hold the same in adjusted positions;

Fig. 9 is a perspective view of the main pivot of the temperature control switch;

Fig. 10 is a section through the fixed contact supporting and insulating block, taken along the line 10—10 of Fig. 1;

Fig. 11 is a perspective view of the supporting and insulating block;

Fig. 12 is a plan view of the spiral thermostatic element of the switch;

Fig. 13 is a front elevation of a thermostatic alarm switch embodying features of the invention;

Fig. 14 is a bottom view of the switch of Fig. 13;

Fig. 15 is a section through the modified switch, taken along the line 15—15 of Fig. 13;

Fig. 16 is a front elevation of a combined high and low temperature control and fire alarm switch assemblage;

Fig. 17 is a side view of the assemblage of Fig. 16; and

Fig. 18 is a front elevation of a modified type of compound switch mechanism.

While the invention has been shown and described herein as being specifically applied in thermostatic switches especially adapted for high and low temperature control for enclosures such as living quarters, chicken coops, refrigeration spaces or the like, and in thermostatic fire alarms, it should be understood that it is not desired to limit the scope by such disclosure, since some of the improved features may obviously be more generally applied to other types of switches adapted for diverse uses.

Referring specifically to the improved high and low temperature control mechanism of Figs. 1 to 12 inclusive, this thermostatic switch comprises in general a combined housing and supporting base 20 preferably formed of sheet metal and of cup shape; a normally fixed high temperature contact 21 carried within the base 20 but insulated therefrom; a pivot 22 rotatably associated with and projecting into the base 20 remote from the contact 21; a high temperature adjusting member or arm 23 having an integral sleeve 24 providing a direct support for the pivot 22 and rotatably engaging an opening in the base 20; a low temperature adjusting arm member 25 coacting with the arm 23 and angularly adjustable about the sleeve 24 thereof; a dial or gage plate 26 secured to the sleeve 24 and cooperable with a pointer 27 carried by the member 25; a low temperature contact 28 carried by the arm of the

member 25 within the base 20; a spiral thermostatic element 29 disposed within the base 20 and having its inner end secured directly to the pivot 22 and having at its outer end contact portions or plates 30 movable into and out of engagement with the contacts 21, 28; and means for resiliently urging the element 29 along the pivot 22 to frictionally hold the members 23, 25 and the pivot 22 in various positions of adjustment.

The cup-shaped housing base 20 may be cylindrical or of any other desirable shape, and has one or more side ventilating openings 30' covered by screening as shown, the housing being further provided with a rear closure plate 31 which may also be formed of sheet metal and carries a ground connection 32 thus grounding the entire base. The base 20 is adapted to be secured to a wall or other support by screws passing through holes 33, and the plate 31 is preferably disposed inwardly of the rear end of the housing as shown, in order to permit the terminals to be connected to the binding posts within the base 20 which may also be provided with a side cut-out 34 through which the wires may be extended into the connecting space. The housing base 20 may be externally plated, polished or otherwise decorated to present a neat and highly finished appearance, and the cup-shape formation of this base besides providing a compact housing, also provides an extremely rigid support. The screening which covers the openings 30' preferably extends entirely around the interior of the side wall of the base 20 and may form an abutment for limiting the inward insertion of the closure plate 31.

The high temperature contact 21 is supported upon an insulating block 35 as shown in Fig. 10, by means of a rivet 36 which is insulated from the base 20 by the block 35 and an insulating clamping washer 37. The support for the fixed contact 21 has an ear 38 which is located within an opening in the closure plate 31 and is spaced therefrom, and the ear 38 has a binding post 39 for connecting one of the electrical terminals thereto. The block 35 may be formed of any suitable insulating material, and may be provided with integral dowels 40 adapted to fit within suitably located holes in the side wall of the base 20, to initially position the block and to subsequently hold the contact 21 in a definite position. It will also be noted that the block 35 serves to hold the protecting screening for the openings 30' in place.

The switch pivot 22 has a notched head 41 at the outer end thereof, and is provided with a slot 42 at its inner end as shown in Fig. 9, and while this pivot is rotatably associated with the base 20, it does not contact directly with the base. The portion of the pivot 22 adjoining the head 41, engages the bore of the sleeve 24 which is formed integral with the adjusting arm 23 as shown in Fig. 5, and the arm 23 is provided with a handle 43 and has a pointer cooperable with graduations 44 disposed on the front of the base 20. The hub portion of the arm member 25 shown in Fig. 6, snugly embraces the sleeve 24 of the arm 23, and is located between the arm 23 and the front face of the dial plate 26 the rear face of which directly frictionally engages the outer front face of the base 20, as shown in Fig. 4. The member 25 projects through an arcuate opening in the base 20 and the movable contact 28 carried by the arm of the member 25, is adjustable relative to this arm only during initial calibration of the switch. The arm of the member 25 is electrically connected to a fixed terminal

nal binding post 45 by a flexible insulated connector 46 so as to permit unimpaired adjustment of the member 25 about the pivot 22 with the aid of a manipulating handle or projection 47 formed on the arm member. The binding post 45 is carried by a fixed bracket 48 spaced from the closure plate 31 and secured to the side wall of the base 20 by an insulator block 35, insulating washer 37, and rivet 36 as previously described in connection with the support for the fixed contact 21.

In order to cause the gage plate 26 to move with the arm 23 and relative to the member 25 during adjustment, the free end of the sleeve 24 is provided with slots 49, and the plate 26 is provided with radial projections 50 adapted to engage these slots. The plate 26 has graduations 51 on the outer face thereof cooperable with the pointer 27, and a washer 52 shown in Fig. 8 and also having radial projections 53 formed to engage the sleeve slots 49, is adapted to coact with the inner end of the sleeve and to frictionally engage the inner face of the front wall of the base 20. The portion of the base 20 which frictionally embraces the sleeve 24, is therefore disposed directly between and frictionally engages the gage plate 26 and the washer 52 as shown in Fig. 4, the projections 50, 53 of these clamping elements causing them to rotate with the arm 23 when this arm is being adjusted.

The inner end of the spiral thermostatic element 29 is bent inwardly to snugly engage the pivot slot 42 as shown in Fig. 12, and a combined spacer and pressure transmitting collar 54 is interposed between one side of the element 29 and the adjacent side of the friction washer 52. The means for resiliently urging the washer 52 and plate 26 against the intervening portion of the base 20, specifically shown in Figs. 3 and 4, consists of a helical compression spring 55 one end of which coacts with a washer 56 engaging the spiral element 29, and the opposite end of which reacts against another washer 57 embracing the pivot 22 and coacting with a cotter pin 58 penetrating the bifurcated pivot end. The spring 55 is preferably compressed sufficiently to cause the same to produce sufficient frictional resistance between the various parts directly embracing the pivot 22 to revolve with this pivot during angular adjustment thereof and to subsequently hold the parts in adjusted position. The washer 52 besides frictionally engaging the supporting base 20, coacts with the collar 54 and washer 56 to retain the spiral element 29 in place upon the pivot 22, so that proper engagement of the contact portions 30 with the contacts 21, 28 will always be assured.

When constructing and assembling the high and low temperature control switches, the thermostatic elements 29 are formed of material having known characteristics but need not be identical as in prior devices of this type, so long as a predetermined change in temperature will always cause the contact portions 30 to move through the same arcs having their limits defined by the contacts 21, 28 when properly set. The graduations 44, 51 are spaced and marked to correspond with each other and with the characteristics of the elements 29, but in order to cause the pointers carried by the arms 23 and by the member 25 to properly register with the correct graduations 44, 51 respectively, the contact 28 of each switch is preferably made adjustable for initial calibration or setting. The contact 21 is fixed relative to the base 20, so that by subjecting the assembled switch to a definite

temperature of 70° Fahrenheit for example, and by setting the arm 23 at 70° on the graduations 44 of the base 20, a screw driver or other implement applied to the slotted head 41 of the pivot 22 may be utilized to bodily revolve the pivot and the thermostatic element 29 carried thereby, and thus cause one side of the contact portion 30 to engage the fixed contact 21 and complete the high temperature control circuit. The member 25 may then be adjusted to cause the pointer 27 to register with the 70° mark and the graduations 51, whereupon the adjustable contact 28 may be caused to engage the opposite side of the contact portion 30, after which the closure plate 31 may be applied and permanently attached to the housing base 20 to complete the switch structure and to make it ready for normal use.

During normal use of the improved high and low temperature control switch and assuming the device to have been properly installed in conjunction with the system with which it is to cooperate, the operation is as follows: For any desired temperature range, the pointer of the arm 23 should be set to the desired point on the graduations 44, and the pointer 27 of the member 25 should be independently set to the desired point on the graduations 51 of the dial plate 26; the arm 23 being adjustable with the aid of the handle 43, while the member 25 is similarly adjustable independently of the arm 23 with the aid of the projection 47. Either of these settings may be effected without in any manner disturbing the other. With the various parts thus properly set the contact portions 30 of the thermostatic element 29 may swing through an arc corresponding to the range of temperature variation actually selected so as to close the control circuits only when the chosen low and high temperatures are reached. It should be apparent that any range of temperature variation may be selected, and that the mechanism may be adjusted to function accurately within such selected range, from the exterior of the housing base 20 and only with the aid of the handle 43, projection 47, and the graduations 44, 51. The compression spring 55 coacting with the washers 56, 57 respectively, normally causes the pivot 22, the arm 23, the dial plate 26 and the element 29 to move together, while permitting the arm 23 to be angularly adjusted relative to the pivot 22; and this spring also serves to retain the parts in adjusted position by clamping the base 20 between the dial plate 26 and the washer 52.

Referring specifically to the alarm switch of Figs. 13, 14, and 15, this improved thermostatic switch is adapted to function only upon attainment of a predetermined high temperature, and therefore does not include the low temperature control feature. This alarm switch comprises in general a combined housing and base 20' similar in construction to the base 20 previously described, a normally fixed contact 21' carried within the base 20' but insulated therefrom; a pivot 22' rotatably associated with the base 20' some distance from the contact 21'; an adjusting member or arm 23' having an integral sleeve 24' providing a direct support for the pivot 22' and rotatably engaging an opening in the base 20'; a spiral thermostatic element 29' disposed within the base 20' and having its inner end frictionally attached to the pivot 22' and also having at its outer end a contact portion 30' movable toward and away from the fixed contact 21'; and modified means for frictionally attaching the element 29' to the pivot 22' and for resiliently frictionally

holding the arm 23' and pivot 22' in adjusted position relative to the base 20'.

The cup-shaped housing base 20' again has one or more ventilating openings 30' covered with screening, and has a rear closure plate 31' provided with binding posts 32', 39' for attachment of the switch to an electrical circuit. The base 20' is adapted for attachment to a wall as previously described, and may also have a cut-out 34 for facilitating attachment of wires running along the outer surface of the supporting wall. The fixed contact 21' may be supported by an insulating block 35 as previously described, which aids in holding the protecting screening in place, and it will be noted that the binding post 39' is electrically connected to the contact 21', while the other post 32' is similarly electrically connected to the thermostatic element 29', the posts 32', 39' however being insulated from each other by the block 35.

The switch pivot 22' also has a slotted head 41' for permitting relative angular adjustment of the arm 23' and element 29', but the inner end of the pivot 22' is provided with screw threads and is solid instead of being slotted. The portion of the pivot 22' adjoining the head 41' is fitted within the bore of the sleeve 24', and the arm 23' has a manipulating handle 43' and a pointer cooperable with graduations 44' located on the front face of the base 20'. The sleeve 24' is embraced near the arm 23' by a friction washer 25', and has a bifurcated end within the base 20', with which a second friction washer 52' interlocks, so that the intervening supporting wall 35 of the base 20' is disposed directly between the two friction washers 25', 52'.

The inner end of the spiral element 29' merely snugly embraces the pivot 22' and a spacing and clamping collar 54' is disposed between one side of the element 29' and the inner washer 52'. The modified means for resiliently urging the washers 25', 52' into frictional clamping engagement with the intervening wall of the base 20', comprises a plate spring 55' the peripheral edges of which coact with a friction washer 56' engaging the opposite side of the element 29', and the other central side portion of which reacts against a nut 57' coacting with the threaded inner end of the pivot 22'. The plate spring 55' may be compressed sufficiently, by turning the nut 57', to produce sufficient friction between the various parts carried by the pivot 22', to cause these parts to revolve with the pivot while permitting angular adjustment of the arm 23' and of the spiral element 29' relative to the pivot.

The mode of constructing and of assembling the modified alarm switch, should be apparent from the foregoing description, and the switch may be readily initially calibrated and subsequently set to operate at various temperatures, as follows: After the switch has been completely assembled, it is necessary to set the adjusting arm 23' relative to the pivot 22' and spiral element 29', so that the pointer of the arm will register with the proper graduation 44' at all times. The switch may be subjected to a definite temperature whereupon the contact portion 30 of the element 29' should be brought into correct contacting relationship with the fixed contact 21'. This may be done by causing the arm 23' to point to the graduation 44' which corresponds to the selected calibrating temperature, whereupon a screw driver or the like may be applied to the pivot head 41' and manipulated to bodily revolve the pivot 22' and the thermostatic

element 29' until the contact portion 30 just engages the fixed contact 21' and sounds the alarm. During normal subsequent use of the switch, the arm 23' may be set with respect to the graduations 44' for any desired contacting temperature, and the contact portion 30 of the thermostatic element will always engage the fixed contact 21' when the selected temperature is reached. For instance, if the selected temperature is 200°, the switch will close when such temperature is attained, but will open and will normally remain open when the temperature is below 200°. It will thus be noted, that the pivot 22' and element 29' may be readily initially adjusted relative to the arm 23' in order to insure proper functioning, and that the element 29' and pivot 22' may be subsequently adjusted to meet various desired conditions of operation, from the exterior of the housing base 20'. The arm 23' may if desired be locked in adjusted position in any suitable manner, and such locking may also be applied to the control switch of Fig. 1.

Referring specifically to Figs. 16 and 17, the compound switch mechanism shown therein is adapted both for high and low temperature control, and for alarm purposes. The high and low temperature control switch of this mechanism is similar to that of Figs. 1 to 4 inclusive, whereas the alarm switch is similar to that of Figs. 13 to 15 inclusive, both of these switches being supported by and housed within a common base 20' but being independently operable. The base 20' is somewhat similar in construction to the bases 20, 20', and a common ground terminal or post 32 may be utilized, thereby simplifying the electrical connections. The arm 23 of this compound mechanism may be utilized to secure the desired high and low temperature regulation of the temperature control portion of the system, whereas the arm 23' may be utilized to set the alarm portion of the same system or of an independent system, thus providing a compact unit of great flexibility and of diverse utility.

Referring specifically to Fig. 18, the modified compound switch mechanism shown therein is also adapted for either high and low temperature control or alarm purposes. The two switches associated with the common housing base 20''' of this mechanism are of the alarm type, but have their spiral thermostatic elements 29' reversely assembled so as to function with minimum and maximum temperatures respectively. One of the elements 29' may therefore be set to close a circuit when a low selected temperature is reached, while the other element 29' may be set to close either the same or an independent circuit when a high selected temperature is attained, and this mechanism is again compact and capable of diverse uses. It will be apparent, that by merely reversing the progression of the readings for the two sets of graduations 44' of this device, the elements 29' need not be reversely attached to their respective pivots 22'.

From the foregoing description, it will be apparent that the present invention provides various improvements in the construction and operation of thermostatic switches whereby a simple and compact structure results, and highly flexible and efficient operation results. The common base and housing feature is applicable to switches of the type forming the subject of the earlier application hereinbefore referred to, and the other features are also applicable more generally than herein disclosed by way of illustration. The various parts of the mechanism may be readily

manufactured and assembled, and all adjustments which are required during normal use, may be made from the exterior of the housing and with minimum effort. The combined housing and base also protects the switch mechanism against tampering while still permitting convenient adjustment when desired, and by frictionally mounting the adjusting arm upon the main pivot, one of the contacts may be fixedly mounted upon the base and necessary initial adjustment may be secured through the arm and pivot. The resilient means carried by the pivot serves the dual function of producing the desired frictional resistance necessary to maintain the parts in adjusted position, and of permitting convenient adjustment of the parts, and has been found highly satisfactory in actual commercial operation.

The high and low temperature control switch may be utilized to advantage in connection with heating or cooling systems for room temperatures, for heater regulation, for refrigerating systems, for chicken coops, and for many other specific purposes; and the alarm may be used in fire-alarm systems, in freezing prevention systems, or in any other system where notification of dangerously high or low temperatures is desirable. The cost of producing the high and low temperature control switch is but slightly more than that of the alarm switch, and is far less than that of the ordinary furnace control switches heretofore utilized for regulating the heater by variations in room temperature. It should also be apparent that the same type of slotted pivot 22 which has been shown as specifically applied to the switch of Fig. 1, may also be applied to the switch of Fig. 13, and that a screw thread and nut 57' may be utilized in place of the cotter pin 58 of the control switch.

It should be understood that it is not desired to limit the invention to the exact details of construction and to the precise mode of operation herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

What I claim is:

1. A thermostatic switch comprising, a base, a contact carried by said base, a pivot rotatably associated with said base, means for effecting rotary adjustment of said pivot about its own axis, said means being rotatable about said axis relative to said base and said pivot being rotatably adjustable relative to said means, and a spiral thermostatic element having its inner end mounted upon said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact.

2. A thermostatic switch comprising, a base, a contact carried by said base, a pivot rotatably associated with said base, means for effecting rotary adjustment of said pivot about its own axis, said means being rotatable about said axis relative to said base and said pivot being rotatably adjustable relative to said means, a spiral thermostatic element having its inner end mounted upon said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact, and means affording a resilient frictional connection between said pivot and said element.

3. A thermostatic switch comprising, a base, a normally fixed contact carried by said base, a pivot rotatably associated with said base, an arm for effecting rotatory adjustment of said pivot about its own axis, said arm being rotatable about said axis relative to said base and said pivot being rotatably adjustable relative to said arm, and a spiral thermostatic element having its inner end mounted upon said pivot and having at its outer end a contact portion movable toward and away from said fixed contact.

4. A thermostatic switch comprising, a base, a normally fixed contact carried by said base, a pivot rotatably associated with said base, an arm for effecting rotary adjustment of said pivot about its own axis, said arm being rotatable about said axis relative to said base and said pivot being rotatably adjustable relative to said arm, a spiral thermostatic element having its inner end mounted upon said pivot and having at its outer end a contact portion movable toward and away from said fixed contact, and means surrounding said pivot and coacting with said element to frictionally connect said arm and said pivot.

5. A thermostatic switch comprising, a base, a contact carried by said base, a pivot rotatably associated with said base, an adjustable arm for said pivot having integral portions frictionally engaging the opposite sides of an integral part of said frame, a spiral thermostatic element having its inner end adjustably associated with said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact, and a spring coacting with said pivot and with said element to urge said arm portions against said integral frame part.

6. A thermostatic switch comprising, a base, a contact carried by said base, a pivot associated with said base, a spiral thermostatic element having its inner end adjustably associated with said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact, said base providing a housing for enclosing said element, and means accessible from the exterior of said housing for effecting rotary adjustment of said pivot about its own axis relative to said base and of said element about said axis relative to said pivot.

7. A thermostatic switch comprising, a base, a contact carried by said base, a pivot associated with said base, a spiral thermostatic element having its inner end adjustably associated with said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact, said base providing a housing for enclosing said element, means accessible from the exterior of said housing for effecting adjustment of said pivot about its own axis relative to said base, and means also accessible from the exterior of said housing for effecting independent rotary adjustment of said element about said axis relative to said pivot.

8. A thermostatic switch comprising, a base, a contact carried by said base, a pivot associated with said base, a spiral thermostatic element having its inner end adjustably associated with said pivot and having at its outer end a contact portion movable toward and away from said first-mentioned contact, said base providing a housing for enclosing said element, means accessible from the exterior of said housing for effecting adjustment of said pivot about its own axis relative to said base, means also accessible from the exterior of said housing for effecting independent rotary adjustment of said element about said axis relative to said pivot, and common resilient means for frictionally retaining

both of said adjusting means in various positions of adjustment.

9. A thermostatic switch comprising, a base, a contact carried by said base, a pivot associated with said base, means for effecting rotary adjustment of said pivot, a gage plate carried by said means, a second contact carrying member adjustably cooperable with said gage plate, and a spiral thermostatic element carried by said pivot and having a contact portion movable between limits defined by said first-mentioned contact and said second contact.

10. A thermostatic switch comprising, a base, a fixed contact carried by said base, a pivot rotatably associated with said base, an arm rotatably supported by said base and providing a support for said pivot, a gage plate rotatable by said arm, a movable contact supported by said arm and adjustable relative to said gage plate, and a spiral thermostatic element carried by said pivot and having a contact portion movable

by temperature variations between said fixed and movable contacts.

11. A thermostatic switch comprising, a base, a contact carried by said base, a pivot associated with said base, means for effecting rotary adjustment of said pivot about its own axis, a second contact carrying member adjustable about the axis of said pivot, and a thermostatic element carried by said pivot and having a contact portion movable between limits defined by said first and second-mentioned contacts.

12. A thermostatic switch comprising, a base, a fixed contact carried by said base, a pivot associated with said base, an arm rotatably supported by said base and providing a support for said pivot, a movable contact carried by said arm, and a thermostatic element carried by said pivot and having a contact portion movable by temperature variations between said fixed and movable contacts.

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