Aug. 4, 1964 G. W. GUSTAFSON 3,143,610

MOISTURE RESPONSIVE CONTROL APPARATUS

Filed Oct. 1, 1958

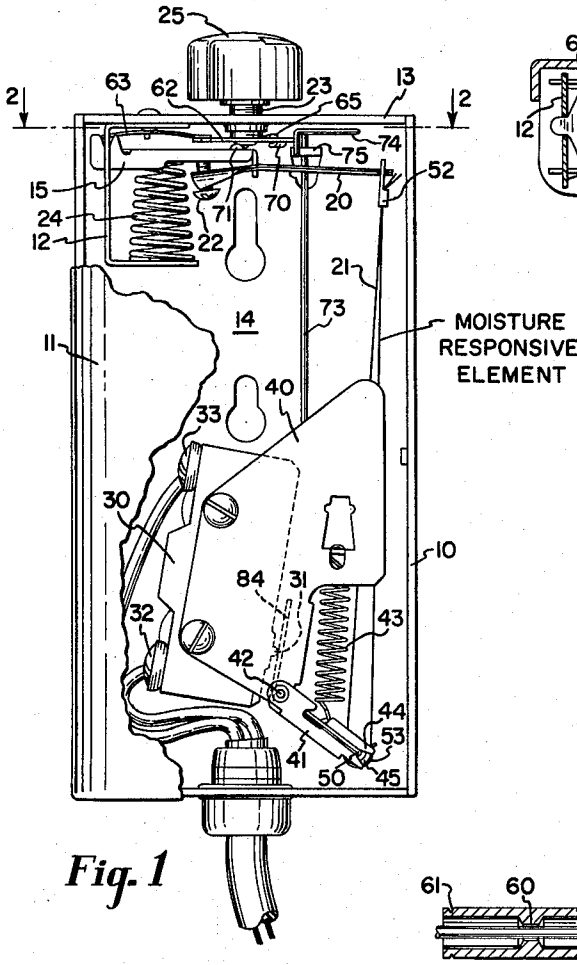


Fig. 1

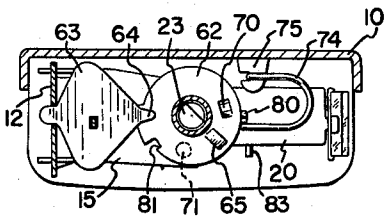


Fig. 2

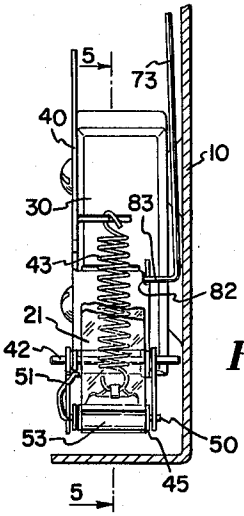


Fig. 3

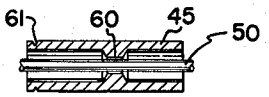


Fig. 4

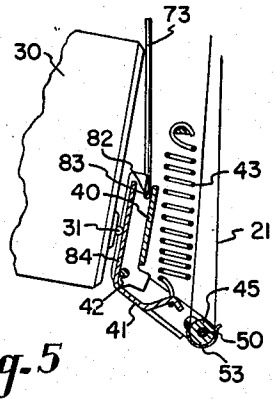


Fig. 5

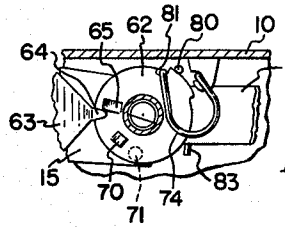


Fig. 6

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MOISTURE RESPONSIVE CONTROL APPARATUS

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The present invention is concerned with a moisture responsive control device; in particular, a device containing a thin ribbon type moisture responsive element which is made up of two parallel portions formed by looping the element over one support and connecting the extremities of the element to another support.

With the increase in residential air conditioning, and residential humidification and de-humidification equipment, the demand for a relatively accurate and yet inexpensive moisture responsive control device has greatly increased. In the present invention, a small compact control device is provided having a reasonable accuracy and yet a low cost.

Therefore, an object of the present invention is to provide an improved moisture responsive control device.

Another object of the present invention is to provide an improved moisture responsive control device with a thin ribbon type sensing element made up of two portions by looping a continuous element over a movable support and connecting the joined ends of the element to another support.

And still another object of the present invention is to provide an improved moisture responsive control device in which the moisture responsive element can be relaxed or placed under tension through the control point setting adjusting means to provide a "positive on" or a "positive off" of the associated controlled apparatus.

And still another object of the present invention is to provide an improved moisture responsive control device having a thin ribbon moisture responsive sensing element which is strung over a roller for equalizing the tension in the two sections of the element as well as the tension across the element between its opposite edges.

These and other objects of the present invention will become apparent upon the study of the following specification and claims of which:

FIGURE 1 is a front view of the control device with a portion of the cover cut away to show the operating mechanism.

FIGURE 2 is a vertical section view of the device of FIGURE 1.

FIGURE 3 is a partial side view of the device shown in FIGURE 1.

FIGURE 4 is a cross-sectional view of a roller supporting the sensing element of the device shown in FIGURE 1.

FIGURE 5 is a sectional view of the operating mechanism associated with the switch of the device shown in FIGURE 1.

FIGURE 6 is a partial cross-sectional view similar to that of FIGURE 2 showing the mechanism in a "positive off" position.

Referring to FIGURE 1, the control device has a base or frame **10** which has a cover **11**. A bracket **12** which is attached to an upper end **13** of the base extends downward into a chamber **14** formed by base **10** and cover **11**. A lever or arm **15** is pivotally attached to the upper end of bracket **12** near end **13**. Another lever or arm **20** is pivotally connected to the free end of lever **15** and extends in the same direction, so that levers **15** and **20** make up a support lever for one end of a moisture responsive element **21**. The relationship of lever **20** with respect to lever **15** and thus the position of the upper end of element **21** is determined by the position of screw **22**.

The factory calibration of the instrument is accomplished by rotating screw **22**. Lever **20** is made of bimetal and provides temperature compensation to the device.

A screw **23** is threaded into upper end **13** to extend into chamber **14**. A coil spring **24** compressed between the lower end of bracket **12** and arm **15** biases arm **15** in an upward direction against the end of screw **23**. By the rotation of a knob **25** attached to screw **23**, the control point of the device is adjusted.

In the lower portion of chamber **14**, a snap switch **30** is attached to the base. The snap switch is a conventional type having an operating plunger or button **31**. Upon moving plunger **31** inward, the switch is operated after the external force is great enough to load a resilient contact member to snap the mechanism and open the circuit connected to terminals **32** and **33**. Obviously the type of switch and whether it opens or closes upon the operating button being moved inward are no part of the present invention, but such change would be obvious to one skilled in the art.

A bracket **40** attached to base **10** pivotally supports a lever **41** about an axis **42**. Lever **41** engages operating button **31** when it is moved in a counterclockwise direction. A spring **43** is connected between lever **41** and base **10** to apply a counterclockwise force to lever **41**. Spring **43** accomplishes the preloading of switch **30**, so that the element **21** need only furnish a small force for operating the switch. Attached to one extremity **44** of lever **41** is a roller **45**. The roller is mounted on a pin or shaft **50** which is held in position by looping one end **51** of the pin into a notch of lever **41**.

The sensing element **21** is a thin ribbon of moisture responsive material which expands upon an increase in the moisture content of the air surrounding the element. The specific material used is a condensation product of 1,6-hexanediamine and adipic acid more commonly known as nylon. The element has appreciable stiffness to afford some resistance to bending. The ribbon element is formed of two parts by looping the element over a bar or roller **45** and connecting the ends of the element by a clamp **52** to the free end of arm **20**. The roller **45** equalizes the tension on the two adjacent portions of the element.

Referring to FIGURE 3, a clip or clamp **53** is attached to the roller to hold the element **21** against the curvature of the roller. This clip is necessary since the nylon ribbon is stiff and does not conform to the curvature of the roller. Without a clip, the resilient element upon contracting to decrease its length between clamp **52** and roller **45** would wrap tighter around the roller. As the element shortened to operate the switch, the load on the element would change to increase the differential of the unit. As the element eventually conformed permanently to the roller, the calibration of the unit would change. By the addition of the clamp, the element is made to conform to the surface of the roller; so that, as the element contracts and pulls upward on the roller and lever **41**, there is no significant change in the position of the element with respect to the roller.

Referring to FIGURE 4, roller **45** is shown mounted on shaft **50**. The portion **60** of the roller which contacts the shaft as it passes through the center of the roller is small with respect to the width of the roller and is slightly off center as measured from the ends of the roller. Since the shaft has a diameter slightly less than the hole through the roller, roller **45** is able to pivot about the shaft in a plane of the drawing as shown in FIGURE 4. With the wide ribbon element **21** wound around the roller, the free movement of the roller with respect to the shaft **50** is important in equalizing the tension which might exist in the ribbon from one edge to the other. The tension of the two sections of the element is equalized by the rotation of the roller, and the tension between

the edges of the ribbon is equalized by rocking the roller about shaft **50** either clockwise or counterclockwise looking at the roller in FIGURE 4. A notch **61** is shown in the outer surface of the roller at one side. The notch is used for identification purposes since the element is centered about the portion **60** of the roller and the distance to the left end from portion **60** is the longer. The notch must project outward as shown in FIGURE 4; so that, the element will be close to the base **10**.

Referring to FIGURES 1 and 2, a disc **62** is attached to screw **23**. Cooperating with disc **62** is a spring **63** which is attached to the upper end **13** of the base. Spring **63** biases disc **62** and screw **23** downward to take up the possible looseness in the threads of screw **23**. Spring **63** has a projection **64** which engages a hump **65** on the disc to act as a limit stop for the control point setting when reaching the dry extremity of its adjustment. As knob **25** is rotated to rotate screw **23** clockwise as shown in FIGURE 2, hump **65** will engage projection **64**. At the same time, a hump **70** on the lower side of disc **62** engages a raised portion **71** on arm **15**. Arm **15** is moved downward to lower the upper extremity of element **21** to allow lever **41** to pivot clockwise and operate the switch **30** to a closed position. The extreme clockwise position of disc **62** is known as the positive on or dry position.

A rod or shaft **73** extends between the control point adjustment mechanism and switch **30**. The upper portion **74** of rod or lever **73**, as shown in FIGURE 2 is pivoted about bracket **75** attached to the base and is bent in a horseshoe shape. The free end portion **80** of horseshoe-shaped portion **74** of lever **73** engages the periphery of disc **62**. A notch **81** in disc **62** opposite projection **70** is adapted to receive end portion **80** when disc **62** is rotated in a counterclockwise direction for positive off by knob **25**. The positive off position is shown in FIGURE 6 with the end portion **80** of shaft **73** caught in the notch **81** to rotate shaft **73** in a clockwise direction. Projection **65** again engages spring end **64** to limit the movement of disc **62**.

The lower end **83** of shaft **73** projects through a notch **82** in bracket **40**. Lower end **83** is rotated in a clockwise direction for the positive off, and as shown in FIGURE 6, and **83** moves to the left to engage a portion **84** of lever **41** to move the lever against the operating button **31** of the switch.

Operation

As shown in FIGURE 1, the moisture responsive control device is set to control at some predetermined level of moisture in the air surrounding element **21**. For explanation purposes, let us assume that switch **30** is closed and the circuit connected between terminals **32** and **33** is closed to operate dehumidification apparatus. Upon a decrease in the moisture content of the air surrounding element **21**, the element **21** will contract to pivot lever **41** counterclockwise. The upper portion **84** of lever **41** engages operating button **31** of the switch to open the switch. The moisture content of the air surrounding element **21** would then increase until the element elongated a sufficient amount to rotate arm **41** clockwise to close the switch and start the dehumidification apparatus.

For a given setting of the instrument as determined by the position of knob **25**, any change in the ambient temperature is compensated for by the movement of the right extremity of arm **20** since the arm is made of temperature responsive bimetal.

For a better understanding of the advantage of clip **53** on roller **45** for holding the nylon element **21** in conformity with the roller surface, the operation of such a device without clip **53** will be considered. With an element having an appreciable stiffness and thereby resisting to conform to the relatively, small, radius curvature of roller **45**, element **21** would tend to loop out on both sides of the roller as it passed over the roller to extend upward to clamp **52**. In other words, both portions of the element **21** would not extend in a straight line from the roller to clamp **52**, but the sections would bow outward depending upon the stiffness of the element. As the element contracted and a force was developed to overcome the normal operating resistance of the switch, some of this force would decrease the degree of non-conformity of the ribbon, so that the ribbon actually wrapped around the curved surface of roller **45** without looping out as far. This resilient action on the part of the ribbon in not conforming to the curvature of the roller **45** would interpose an error in the operation of the device.

With the use of clip **53**, the resilient element **21** is made to conform to the curvature of roller **45**, so that the adjacent portions of the element lay practically parallel between roller **45** and clip **52**. Upon the increase in the tension of the element as it contracts by a lower humidity content in the surrounding air, the full movement of the contraction is applied through roller **45** to move lever **41**.

In order to insure that the tension placed on element **24** is not beyond its elastic limit, spring **21** acts as the strain release spring. Once upper end **84** of arm **41** engages the operating button of the switch and the switch is actuated, no further movement of arm **41** can exist. Should the element continue to decrease in length, a limit on the tension of the element is determined by the compression force of the strain release spring **24**. Arms **15** and **20** rotate clockwise as a unit to release the tension on element **21**.

As the position of arm **41** changes, the tension on the two portions of element **21** can vary. Since the element is looped over roller **45**, the tension on the two portions of the element will equalize by a small movement of the roller. At the same time, the strain on the element from one edge to the other is equalized by the position roller **45** takes with respect to the shaft in the plane of the paper as shown in FIGURE 4. Such an unequal tension in that direction might take place due to a screw in the ribbon itself during manufacture or due to the build up of tolerances in the device. By the novel means of supporting roller **45** on shaft **50**, the axis of roller **45** is insured perpendicular to the length of the ribbon and no unequal tensions exist across the ribbon from edge to edge.

To provide a positive off, the knob **25** is rotated to turn screw **23** in a counterclockwise direction as shown in FIGURE 2. The end **80** of shaft **73** rubs along the periphery of disc **62** until it is received in the notch **81**. Further movement of disc **62** in a counterclockwise direction pulls the horseshoe-shaped end **74** in a clockwise direction until it rests in a position as shown in FIGURE 6. In this position, the lower end **83** of shaft **73** is moved in a clockwise direction, as shown in FIGURE 6, to engage upper portion **84** of operating lever **41** to apply a force to operating button **31** of the switch. The "positive off" limit of the rotation of knob **25** is determined by the engagement of raised portion **65** and spring **63**.

For a "positive on" operation of the control, knob **25** is rotated to turn screw **23**, as shown in FIGURE 2, in a clockwise direction. When the projection **70** on the lower side of disc **62** engages projection **71** on the upper side of arm **15**, arm **20** is moved downward to relax element **21**. Lever **41** is then moved in a clockwise direction as shown in FIGURE 1 to operate switch **30**.

While the invention has been described and disclosed as a moisture responsive element, the intention is to limit the scope of the invention only by the appended claims in which

I claim:

1. In a moisture responsive device, a frame, a first lever pivotally mounted on said frame, an adjustment screw received by said frame and engaging said lever, a second lever pivotally mounted on said frame, control means, said second lever being adapted to operate said control means when pivoted in a first direction, a spring connected between said second lever and said frame for biasing said second lever in said first direction, a thin ribbon moisture responsive element, a roller connected to said

second lever, means connecting the ends of said ribbon to said first lever and looping said ribbon over said roller so that upon contraction of said element upon a change in moisture said second lever is moved in said first direction, said roller equalizing the tension between the two portions of said ribbon, means associated with said screw for providing a positive-off, and further means associated with said screw for providing a positive-on operation of said control means.

2. In a moisture responsive device, a frame, a first lever pivotally mounted on said frame, an adjustment screw received by said frame and engaging said lever, a second lever pivotally mounted on said frame, control means, said second lever being adapted to operate said control means when pivoted in a first direction, a spring connected between said second lever and said frame for biasing said second lever in said first direction to preload said control means, a thin ribbon moisture responsive element, a roller connected to said second lever, means connecting the ends of said ribbon to said first lever and looping said ribbon over said roller so that upon contraction of said element upon a change in moisture said second lever is moved in said first direction, said roller equalizing the tension between the two portions of said ribbon, and means attached to said roller to partially form said ribbon about said roller.

3. In a moisture responsive device, a base, an adjustable member attached at one end of said base, a switch mounted on said base, said switch having a member for actuating said switch, a lever attached to said base and engaging said member, said lever having a free end, a first member pivotally attached to said free end of said lever said first member being free to pivot about an axis and about a point between its ends in a plane of said axis, and a moisture responsive ribbon, said ribbon being wrapped over said first member and attached to said member whereby upon a change in the length of said ribbon as moisture level changes said lever pivots to actuate said switch, said first member providing for the equalization of tension between separate portions of said ribbon and said first member can rock to maintain the tension between opposite sides of said ribbon equal.

4. In a moisture responsive device, a frame, an operating lever attached to said frame, a thin ribbon type moisture responsive element, a round surface member attached to said lever, said element being looped over said member and having its extremities attached to said frame so that upon contraction of said element a force is applied to said member to move said lever, said element resisting conformance to said member, and a clip having a shape to match said surface, said clip being placed on said member to form said element to the shape of said member so that said element does not spring away from said member to introduce an error in the operation of the device.

5. In a moisture responsive device, a base, a first lever pivotally supported on said base, a moisture responsive element, said element being supported at one extremity by an extremity of said lever, control means, resilient means biasing said control means in a first position means connecting another extremity of said element to said control means, an adjusting screw associated with said base and providing for movement of said first lever with respect to said base, second means connecting said adjusting screw and said control means so that when said adjusting screw is in one extreme position said control means is operated to a second position independent of said element, and means connected to said adjusting screw to relax said element when said adjusting screw is in another extreme position so said control means operates to said first position.

6. A humidistat comprising a mounting bracket, a rotatable adjusting member having a threaded mounting in a wall of said bracket and terminating in a free abutment end inwardly of said wall, an electric switch unit having a resilient contact member adapted to move to circuit make and break positions, said contact member requiring an external force to move it to one of said positions and being spring biased to the other of said positions, a push button type plunger adapted to actuate said contact member to one of said positions against its biasing force, a first switch lever of generally bell-crank shape having an arm adapted to depress said plunger button and a lever arm projecting free, an adjusting lever movably supported adjacent the inner abutment end of said adjusting member, a spring biasing said adjusting lever toward the abutment end of said adjusting member, the one end of said adjusting lever projecting free in spaced relation to the free arm of said first switch lever, a humidity element consisting of a length of humidity responsive material connected to the free arm of said first switch lever and the free end of said adjusting lever, a second switch lever fulcrumed at an intermediate point and having its inner extremity adapted to engage and actuate said push button plunger independently of said first switch lever and its outer extremity terminating in the region of said adjusting member, and means rotatable with said adjusting member adapted to engage and actuate said second-named lever for manually controlling the position of said push button plunger independently of the automatic control afforded through response to changes in relative humidity of said humidity element.

7. A humidistat as claimed in claim 6 wherein said means rotatable with said adjusting member is provided with a radially-projecting cam sector adapted to engage the adjacent end of said second switch lever when the adjusting member is rotated to an extreme position in a direction to stress said humidity element.

8. A humidistat including a humidity element in the form of a length of humidity responsive material, an electric switch unit having a resilient contact member adapted to move to circuit make and break positions; means for actuating said contact member comprising an actuating lever having an arm projecting free and an adjusting lever having a free end spaced from said arm with said humidity element connected between said arm and free end of said adjusting lever; an adjusting member for manually positioning said adjusting lever to adjust the tension of said humidity element, a second lever arranged to actuate said contact member independently of said first-named actuating lever, and means for manually controlling said second lever.

9. A humidistat comprising a mounting bracket, a rotatable adjusting member having a threaded mounting in a wall of said bracket and terminating in a free abutment end inwardly of said wall, an electric switch unit having a resilient contact member adapted to move to circuit make-and-break positions, said contact member requiring an external force to move it to one of said positions and being spring-biased to the other of said positions, a push button type plunger adapted to actuate said contact member to one of said positions against its biasing force, a first switch lever of generally bell-crank shape having an arm adapted to depress said plunger button and a lever arm projecting free, an adjusting lever movably supported adjacent the inner abutment end of said adjusting member, a spring biasing said adjusting lever toward the abutment end of said adjusting member, said adjusting lever having one end projecting free in spaced relation to said lever arm of said first switch lever, a humidity element consisting of a length of humidity-responsive material connected to said lever arm of said first switch lever and said end of said adjusting lever, a second switch lever fulcrumed at an intermediate point and having its inner extremity adapted to engage and actuate said push button plunger independently of said first switch lever, said second lever having an outer extremity terminating in the region of said adjusting member inwardly of said wall, a cam secured on the inner extremity of said adjusting member for rotation therewith, said cam having a segment adapted to engage the outer end of said second-named lever when said adjust-

ing member is rotated to one of its extreme positions and to actuate said push button plunger independently of said first lever, said cam having a detent notch, and a detent spring means for releasably engaging said notch when said cam member is rotated to one extreme position for retaining said adjusting member in said one extreme position.

10. A humidistat comprising a mounting base, a rotatable adjusting member having a threaded mounting in a wall of said base and terminating in a free abutment end inwardly of said wall, an electric switch unit, a push button type plunger adapted to actuate said switch, a first switch lever of generally bell-crank shape having an arm adapted to depress said plunger button and a free projecting lever arm, an adjusting lever pivoted on said base, a spring biasing said adjusting lever toward the abutment end of said adjusting member, said adjusting lever comprising a temperature responsive portion, said adjusting lever projecting free in spaced relation to the free arm of said first switch lever so the movement of said free arm is unaffected by changes in space temperature, a humidity element consisting of a length of material changing in length upon changes in temperature and humidity connected to said free arm and said temperature responsive portion of said adjusting lever whereby said switch is controlled in response to changes in the moisture content of air surrounding said material and is unaffected by changes in temperature.

11. A humidistat comprising a mounting case, a rotatable adjusting member having a threaded mounting in a wall of said case and terminating in a free abutment end inwardly of said wall, an electric switch unit, a push button type plunger adapted to actuate said switch unit, a first switch lever having one arm adapted to depress said plunger button and a second arm projecting free, and adjusting lever pivotally supported on said case and biased against said free abutment end of said adjusting member, said adjusting lever having one end projecting free in spaced relation to said second arm of said first switch lever, a humidity element consisting of a length of humidity-responsive material connected between said one end and said second arm, a second switch lever fulcrumed at an intermediate point and having its inner extremity adapted to actuate said switch unit independently of said first switch lever, said second lever having an extremity terminating in the region of said adjusting member inwardly of said wall, a member secured on the inner extremity of said adjusting member for rotation therewith and adapted to engage the outer end of said second-named lever when said adjusting member is rotated to one extreme position to actuate said switch unit independently of said first lever, said member having a detent notch, and means for releasably engaging said notch when said member is rotated to said one extreme position for retaining said adjusting member in said one extreme position.

12. A humidistat comprising, a rotatable adjusting member, an electric switch, a push button type plunger adapted to actuate said switch, a first switch lever of generally bell-crank shape having an arm adapted to depress said plunger button and a lever arm projecting free, an adjusting lever movably supported adjacent an inner abutment end of said adjusting member, a spring biasing said adjusting lever toward said abutment end of said adjusting member, said adjusting lever having one end projecting free in spaced relation to said lever arm of said first switch lever, a humidity element consisting of a length of humidity-responsive material connected to said lever arm of said first switch lever and said end of said adjusting lever, a cam secured on the inner extremity of said adjusting member for rotation therewith, said cam having a segment adapted to engage the outer end of a second lever when said adjusting member is rotated to one of its extreme positions and to actuate said push button plunger independently of said first lever, said cam having a detent notch, and a detent spring means for releasably engaging said notch when said cam member is rotated to one extreme position for retaining said adjusting member in said one extreme position.

13. A humidity control including a humidity element in the form of a length of humidity-responsive material, an electric switch unit having a resilient contact member adapted to move to circuit make-and-break positions, said switch having an operating button requiring an external force to operate said switch; and actuating lever having an arm projecting free, a first spring, means connecting said spring to said actuating lever to bias said actuating lever against said operating buttom to provide a predetermined loading force thereon, an adjusting lever having a free end, a second spring, means connecting said second spring to said adjusting lever to bias said adjusting lever, a humidity element changing in length with changes in humidity level, means connecting said humidity element between said arm and said adjusting lever, and adjusting member for manually positioning said adjusting lever for additionally loading said operating button depending on said length of said humidity element.

14. A humidistat including a humidity element in the form of a length of humidity-responsive material, an electric switch unit having a resilient contact member adapted to move to circuit make-and-break positions; and actuating lever having an arm projecting free, a first spring, means connecting said spring to said actuating lever to bias said actuating lever against said contact member, an adjusting lever having a free end, said adjusting lever comprising a temperature responsive portion which bends with changes in temperature, a second spring, means connecting said second spring to said adjusting lever to bias said adjusting lever in a first direction, a humidity element changing in length with changes in humidity level, means connecting said humidity element between said arm and said adjusting lever, and an adjusting member for manually positioning said adjusting lever to adjust the tension on said humidity element, whereby the operation of said switch unit is affected by changes in humidity level and in changes in temperature.

15. A humidity control comprising a mounting bracket, a rotatable adjusting member being mounted in a wall of said bracket, an electric switch unit having a contact member adapted to move to circuit make-and-break positions, said contact member requiring an external force to actuate it to one of said positions and being spring-biased to the other of said positions, a member for actuating said contact member against its biasing force, a switch lever of generally bell-crank shape having an arm adapted to depress said member and a lever arm projecting free, an adjusting lever movably supported adjacent said adjusting member, a spring providing a biasing force for biasing the adjusting lever toward a surface of said adjusting member, one end of said adjusting lever projecting free in spaced relation to the free arm of said bell crank lever, a humidity element comprising a length of humidity responsive material connected to the free arm of said bell crank lever and the free end of said adjusting lever, and means associated with said adjusting member to independently actuate said contact member to override the effect of said humidity element.

16. In a moisture responsive control device, a case, a switch mounted in said case, a moisture responsive element which changes in length with humidity level of the surrounding air, a switch operating means mounted in one end of said case, resilient means for biasing said switch operating means in a first direction, a lever mounted in an opposite end of said case, means connecting said moisture responsive element to said switch operating means to actuate said switch depending upon the changes in level of moisture, a control point adjusting means comprising a shaft mounted in said case and having a cam attached thereto, said control point adjusting means

being adapted to vary the effect of said moisture responsive element on said actuating means to change the level of moisture in the surrounding air needed to close said switch, said cam means having a high portion at one extreme end for engaging said lever to relax said moisture responsive element to obtain a "positive" actuation of said switch.

17. A humidity control comprising a mounting bracket including a wall, a rotatable adjusting member mounted in said wall of said bracket, a movable member, means connecting said movable member to said adjusting member, an electric switch unit having a contact member, adapted to move to circuit make-and-break positions, said contact member requiring an external force to actuate it to one of said positions and being spring-biased to the other of said positions, an operating member for actuating said contact member against its biasing force, a switch lever of generally bell-crank shape having an arm adapted to depress said operating member and a lever arm projecting free, an adjusting lever movably supported adjacent said adjusting member, a spring providing a biasing force for biasing the adjusting lever toward a surface of said adjusting member, one end of said adjusting lever projecting free in spaced relation to the free arm of said bell crank lever, a humidity element comprising a length of humidity responsive material connected to the free arm of said bell crank lever and the free end of said adjusting lever, and means including said movable member connecting said adjusting member to independently actuate said contact member to override the effect of a change in length of said humidity element on said contact member.

18. A humidity control comprising a mounting bracket

including a wall, a rotable adjusting member mounted in said wall of said bracket, a movable member, means connecting said movable member to said adjusting member, an electric switch unit having a contact member adapted to move to circuit make-and-break positions, said contact member requiring an external force to actuate it to one of said positions and being spring-biased to the other of said positions, an operating member for actuating said contact member against its biasing force, a switch lever of generally bell-crank shape having an arm adapted to depress said operating member and a lever arm projecting free, an adjusting lever movably supported adjacent said adjusting member, a spring providing a biasing force for biasing the adjusting lever toward a surface of said adjusting member, one end of said adjusting lever projecting free in spaced relation to the free arm of said bell crank lever, a humidity element comprising a length of humidity responsive material connected to the free arm of said bell crank lever and the free end of said adjusting lever, and means including said movable member connecting said adjusting member to independently actuate said contact member to a circuit make position to override the effect of a change in length of said humidity element on said contact member.

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