

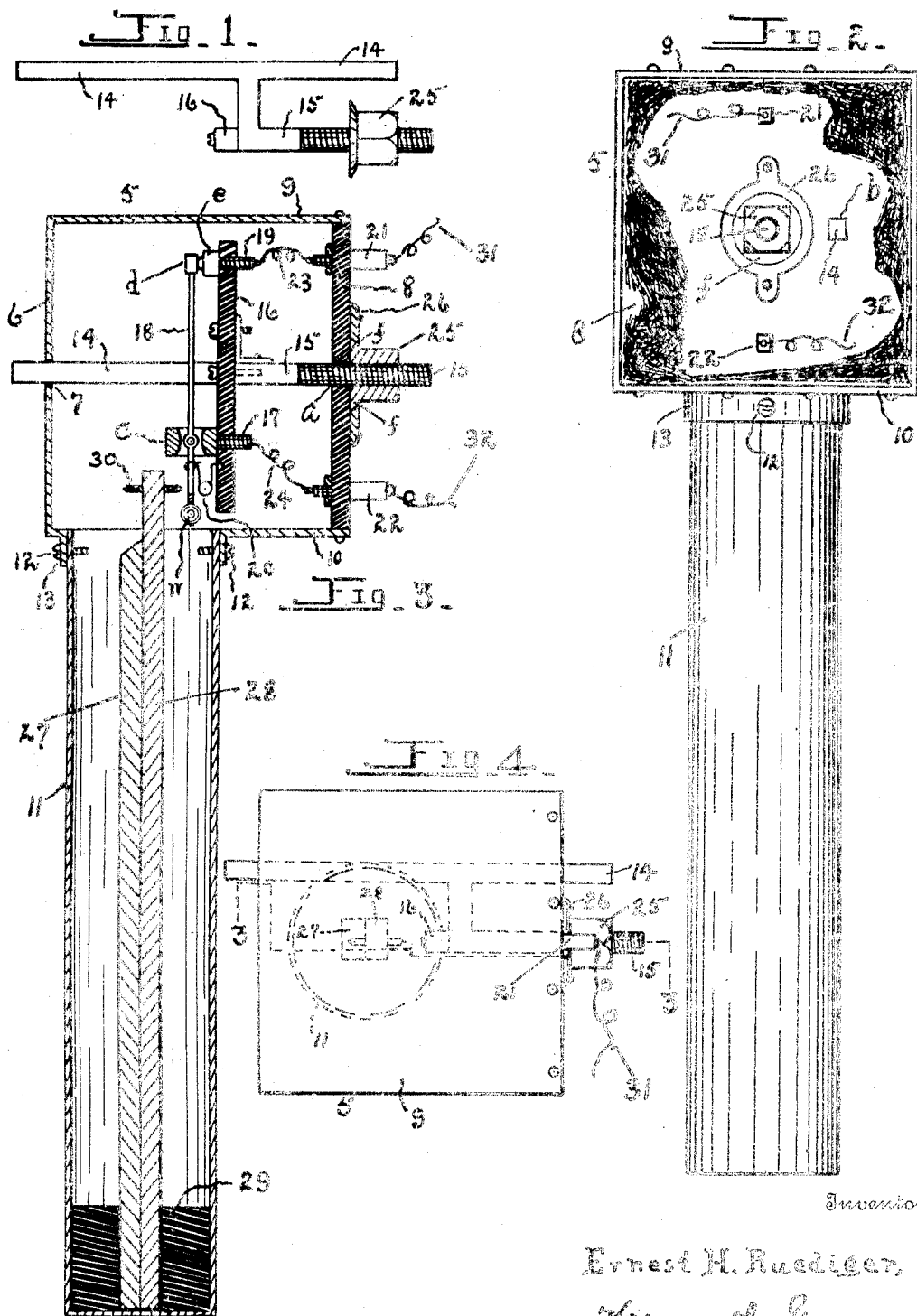
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BIMETALLIC ELECTRIC THERMOREGULATOR

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BIMETALLIC ELECTRIC THERMOREGULATOR.

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To all whom it may concern:

Be it known that I, ERNEST HENRY RUEDIGER, a citizen of the United States, residing at Bismarck, in the county of Burleigh and State of North Dakota, have invented certain new and useful Improvements in a Bimetallic Electric Thermoregulator, of which the following is a specification.

This invention relates to an improvement in that class of electric thermo-regulators in which bimetallic bars are employed, and has for its objects to provide a device which will be convenient and durable in use and accurate in operation, and may be readily adjusted to control varying degrees of temperature. One of the specific objects is to provide such a construction that the bimetallic bar, during operation, will not form a part of an electrical circuit; another object is to provide such a mounting for the container of the bimetallic bar that the extremes of heat and cold temperatures may be regulated.

In the accompanying drawing which illustrates the invention, Fig. 1 is a plan view of an adjusting-bar. Fig. 2 is a front view of the device. Fig. 3 is a sectional view on line 3—3 of Fig. 4. Fig. 4 is a plan view of the device.

Referring now to the drawing, I provide a casing 5 having a back 6 provided with an aperture 7, its front consisting of an insulating-plate 8 which is disposed between and is removably secured to the top 9 and bottom 10. The plate 8, approximately at its middle, is provided with an aperture *a*, and also is provided, adjacent to aperture *a* with an aperture *b*.

Numeral 11 indicates a cylindrical receptacle, and, by means of keepers 12 it is removably secured to the circular flange 13 of the bottom 10 of the casing.

At 14 is indicated a supporting-bar preferably disposed at right-angles to the plate 8 and slidably mounted in the apertures 7 and *b*, said bar being provided, parallel therewith and adjacent thereto, with an adjusting-arm 15 adapted to be mounted in the aperture *a*, and upon the inner end of the arm 15 and disposed at right-angles thereto is secured an insulating-bar 16; and on account of the arrangement of parts thus mentioned any swinging movement of the arm 15, relative to the bar 14, will be prevented, this feature being quite important so that the insulating-bar 16 may be prac-

tically free from vibration and will be stationary, during operation, with the casing.

Numeral 17 indicates an electrical contact-member which is preferably threaded in the lower end-portion of the bar 16, and having a head *c* which provides a pivotal mounting for an electrical conducting-rod 18 having the form of a rock-lever, upon the lower end and short arm of said rod being mounted a weight *w* and upon the upper end and long arm of said rod being mounted a head *d* adapted to engage the head *e* of the electrical contact-member 19 which, preferably, is threaded in the upper end-portion of said bar 16. Numeral 20 indicates a spring operating to normally cause engagement of the heads *d* and *e*.

Numerals 21 and 22 indicate binding-posts mounted in the plate 8. The post 21 is provided with an electrical conductor 23 connected with member 19, and the post 22 is provided with an electrical conductor 24 connected with member 17.

Means are provided tending to prevent vibration of the adjusting arm 15 and for moving the insulating-bar 16 and parts connected therewith somewhat nearer to or further from the plate 8, said means consisting of a nut 25 which may be rotated on the threaded end-portion of the adjusting-arm 15, said nut being provided with a flange *f* engaging the inner side of a collar 26 which is secured to the plate 8.

Numerals 27 and 28 indicate bars having comparatively unequal expansion, the expansion of the bar 27 being greater than the expansion of the bar 28. These normally parallel bars, while identified separately may be considered as a bimetallic bar or integral structure, their inner sides being in constant engagement, their lower ends being mounted stationary with the cylindrical receptacle 11, in the lower end of the latter, a cylindrical block 29, in the present instance, being shown for this purpose, the upper end of the bar 28 normally being disposed adjacent to the lower end of the pivotally mounted rod 18 and provided with a contact-pin 30 preferably projecting outwardly of its opposed sides.

Operation of the device depends, primarily, in adjusting the bar 16 by use of the nut 25, so that the short arm of the electrical conductor-rod 18 will be disposed a suitable distance from the pin 30. Pin 30 is made of insulating material.

Numerals 31 and 32 indicate electrical conductors for the respective posts 21 and 22, and as described they form parts of a normally closed electrical circuit, and it will be seen that the device may be used to advantage in maintaining a uniform degree of temperature. For instance, it may be desired to maintain a certain high degree of temperature of water in a container (not shown), a part of the means for producing the heat for that purpose being an electrical circuit in which the electrical conductors 31 and 32 form a part. It will be understood that if the receptacle 11 is immersed in the water thus heated, the bar 27 of greater expansion will cause such a degree of inclination for the bar 28 that the pin 30 will be pressed against the lower end of the electrical conductor 18, the result being that the electrical circuit will be broken and will remain broken until the temperature of the water has been reduced in degree.

As soon as the temperature of the water has been reduced in degree, however, the bars 27 and 28 will move slightly from their inclined position, the pin 30 being disengaged from the rod 18, and by operation of the spring 20 the electrical circuit will again become complete and heating of the water will continue, and therefore, during operation, engagements and disengagements of the pin 30 and rod 18 will frequently occur, the result being that the temperature of the water will remain practically uniform. While water has been mentioned specifically, the device, of course, may be employed for maintaining temperatures of air or fluids generally.

If it is desired to use the device in connection with a cooling system where a certain low temperature is to be maintained, the receptacle 11 may be moved circularly a half circle for its mounting on the flange of the casing, after the keepers 12 have been removed; and in operation, as soon as the desired degree of low temperature has been reached, the opposite end of the pin 30 to that last described, will be moved into engagement with the rod 18, the electrical circuit thereupon being broken, and further cooling will cease. As the temperature rises again the bimetallic bar will bend in the opposite direction, the pin 30 being disengaged from the rod 18, and by operation of the spring 20 the electrical circuit will be completed to permit the operation of cooling to be resumed.

The advantages derived by use of the weight *w* is that it causes the weight of the short arm and long arm of the rod or lever 18 to be equal. The advantage in the use of a difference in length for the arms of member 18, is that a slight movement of the short arm will cause a rapid movement of the head *d* for its engagement or disengage-

ment with the head *e*. It will be noted that no stresses will be directed to the bimetallic bar, at any time except when the device is in operation, as it does not form a part of an electrical circuit.

I claim as my invention:

1. A bimetallic electric thermo-regulator, comprising, in combination with a casing and a communicating receptacle, an adjusting-arm mounted upon and extending within the casing, an insulating-bar mounted on the adjusting-arm, an electrical contact-post on said bar, a second electrical contact-post on said bar, an electrical conducting-rod pivotally mounted between its ends on the first named post and normally engaging the second post to form a part of an electrical circuit, the parts of said rod outwardly of its pivotal mounting being approximately of equal weight, a bimetallic bar in the receptacle normally disengaged from said rod and adapted, when subjected to a change in temperature to be moved into engagement with said rod to cause disengagement of the latter from the second electrical contact-post, said arm being adjustable longitudinally for maintaining the electrical conducting-rod at selected distances from the bimetallic bar.

2. A bimetallic electric thermo-regulator, comprising, in combination with a casing and a communicating receptacle, a supporting-bar slidably mounted in the walls of the casing and having an adjusting-arm parallel therewith and adjacent thereto provided with a threaded part projecting outwardly of the casing, an insulating-bar disposed at right-angles to and carried by the adjusting-arm, an electrical contact-post on the insulating-bar, a second electrical contact-post on said insulating-bar, an electrical conducting-rod pivotally mounted between its ends on the first named post and providing a long arm normally engaging the second post and providing a short arm approximately equal in weight to the weight of the long arm, a bimetallic bar in the receptacle normally disengaged from said rod and adapted when subjected to a change in temperature to move into engagement with the short arm for causing disengagement of the long arm of said rod from the second electrical contact-post, and a nut rotatable on the threaded part of said adjusting-arm for disposing the electrical conducting-rod at selected distances from the bimetallic bar.

3. In a bimetallic electric thermo-regulator, the combination with a casing, of an adjusting-arm mounted non-revolubly in and having a threaded part extending outwardly of the casing, an insulating-bar disposed at right-angles to said arm and stationary therewith, an electrical contact-post on the bar, a second electrical contact-post on said bar, an electrical conducting-rod

pivotally mounted between its ends on the first named post providing a long arm normally engaging the second post and providing a short arm approximately equal in weight to the long arm of said rod, a bi-metallic bar normally disengaged from the electrical conducting-rod and adapted, when subjected to a change in temperature, to move into engagement with the short arm for causing disengagement of the long arm of said rod from the second electrical contact-post, a collar mounted on the casing and traversed by the threaded part of the adjusting-arm, and a nut having a flange engaging said collar and revoluble for moving said adjusting-arm.

In testimony whereof I have affixed my signature in presence of two witnesses.

ERNEST HENRY RUEDIGER.

Witnesses:

BERTHA R. BURTON,
NETTIE W. GAULKE.