F. S. DENISON.

CLOCK ATTACHMENT FOR ELECTRIC THERMOSTATS.

APPLICATION FILED JAN. 18, 1916.

1,228,757.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

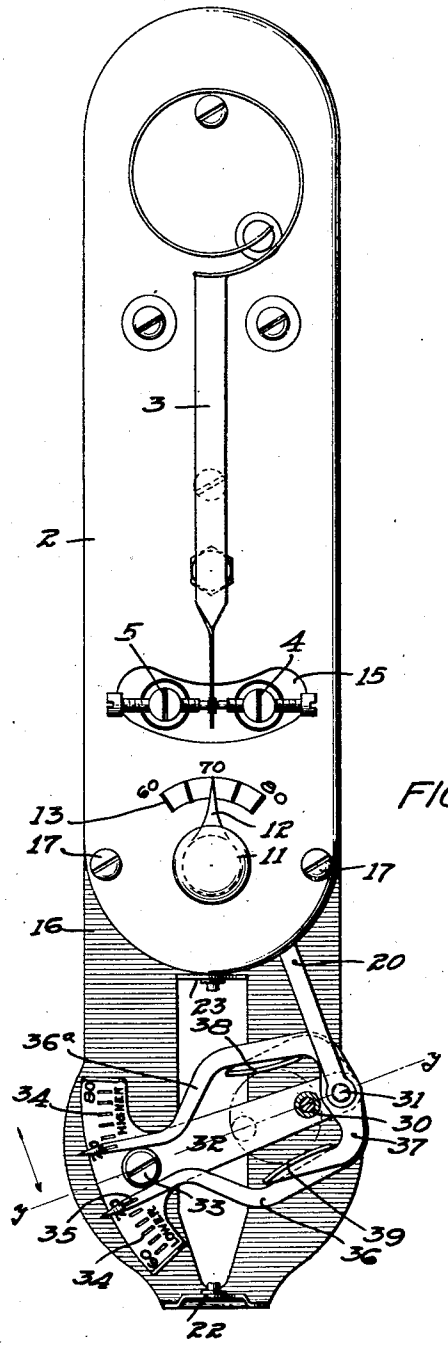

FIG. 1.

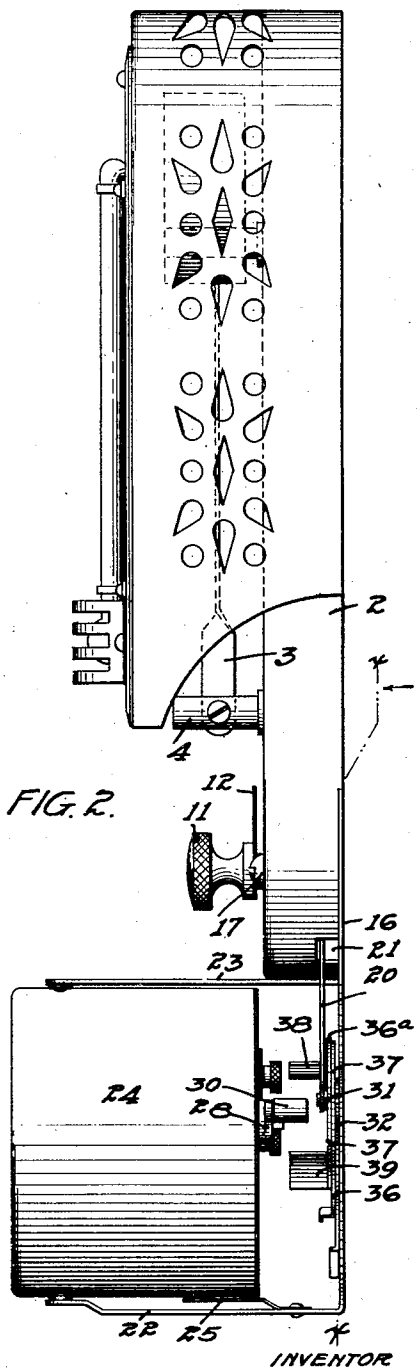

FIG. 2.

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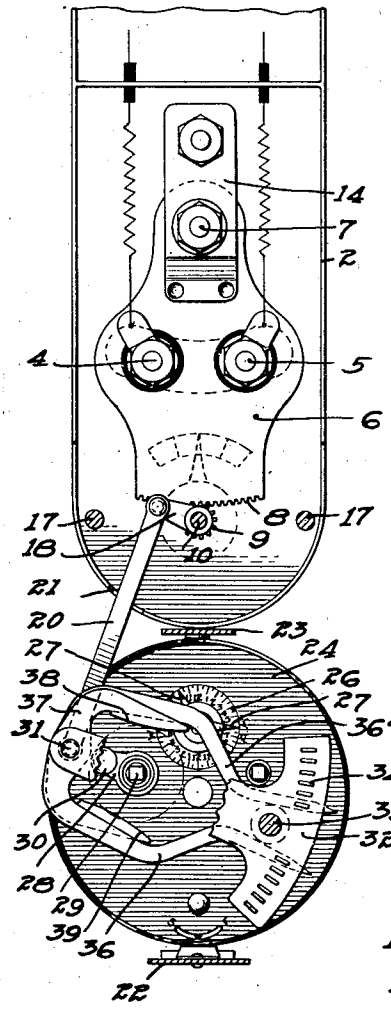

FIG. 3.

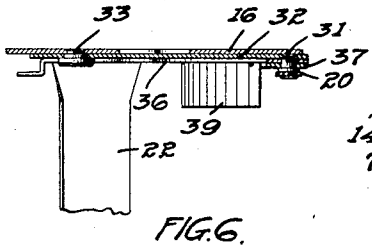

FIG. 6.

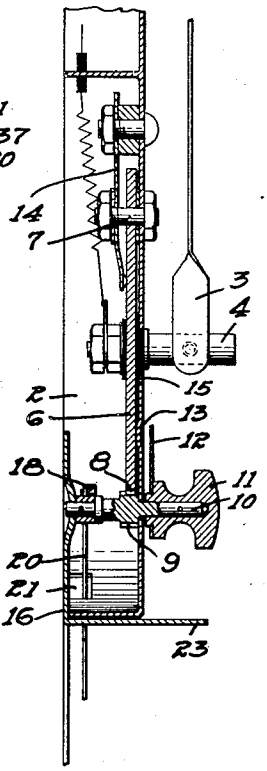

FIG. 5.

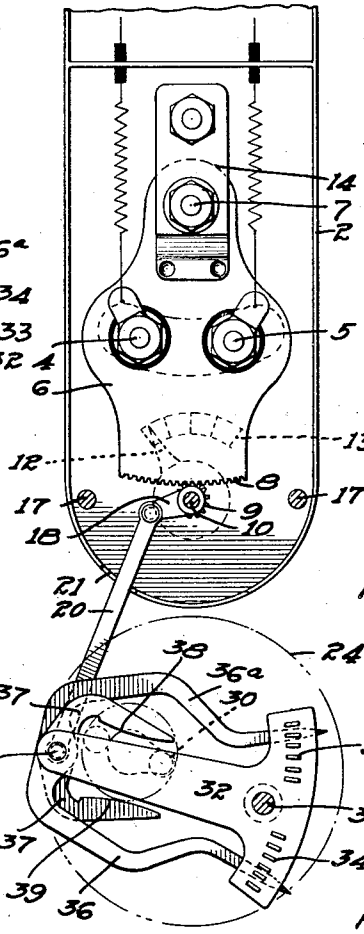

FIG. 4.

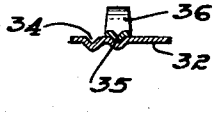

FIG. 7.

WITNESSES

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UNITED STATES PATENT OFFICE.

FREDERICK S. DENISON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO MINNEAPOLIS HEAT REGULATOR CO., OF MINNEAPOLIS, MINNESOTA, A CORPORATION.

CLOCK ATTACHMENT FOR ELECTRIC THERMOSTATS.

1,228,757. Specification of Letters Patent. Patented June 5, 1917.

Application filed January 18, 1916. Serial No. 72,696.

To all whom it may concern:

Be it known that I, FREDERICK S. DENISON, citizen of the United States, resident of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Clock Attachments for Electric Thermostats, of which the following is a specification.

My invention relates to that class of attachments shown and described in the patent to Kersteter, No. 1,012,365, issued December 19, 1911, and the object of the invention is to provide a mechanism by means of which, through the operation of the time piece, the thermostatic contact points can be automatically shifted, not only from night to day adjustment, but from day to night adjustment.

A further object is to provide a mechanism of comparatively simple construction for automatically shifting the contact points, and one which is easily accessible for examination or adjustment.

A further object is to provide a shifting mechanism which can be adjusted by hand in either direction whenever desired.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a front view of a thermostat embodying my invention, with the clock removed,

Fig. 2 is a side view of the same,

Fig. 3 is a rear view, partially in section, on the line *x*—*x* of Fig. 2.

Fig. 4 is a similar view, showing the position assumed by the parts of the mechanism when the thermostat is set for a higher temperature than normal,

Fig. 5 is a longitudinal sectional view through the lower portion of the base of the thermostat, showing the connection of the attachment with the post of the indicator hand,

Fig. 6 is a sectional view on the line *y*—*y* of Fig. 1,

Fig. 7 is a detail sectional view, showing the means for holding the shifting mechanism against premature movement.

In the drawing, 2 represents the base of the thermostat, 3 a thermostatic bar mounted to close the electric circuit through contact posts 4 and 5 which are mounted in a plate 6 that is pivoted at 7 to the base of the thermostat. This plate has a curved rack 8 formed on the lower end thereof, meshing with the teeth of a pinion 9 on a post 10 which carries a finger grip 11 and the indicator hand 12 that is movable over a scale 13 on the face of the base of the thermostat. A spring 14 is provided at the upper end of the plate 6 and mounted to bear thereon with a yielding pressure, and while permitting freedom of lateral movement of said plate exerts sufficient pressure thereon to prevent premature or accidental change of position. The contact posts project through a slot 15 provided in the base of the thermostat and are adjustable with their supporting plate toward and from the thermostatic bar.

A plate 16 is secured to the lower end of the base 2 by suitable means, such as screws 17, and has a bearing for the inner end of the stud 10 and a crank arm 18 is mounted on said stud and pivotally connected to a link 20 which extends downwardly through a slot 21 in the wall of the thermostat base. The lower end of the plate 16 has an outwardly turned arm 22 formed thereon and a similar arm 23 is punched out of the upper portion of said plate and projects outwardly, parallel with the arm 22. Between these arms a time-piece 24 is pivoted, and held against premature oscillation by means of a spring 25 substantially as shown and described in Patent No. 1,020,289, issued March 12, 1912, to Minneapolis Heat Regulator Company, assignee of Joel C. Kersteter.

This time-piece has a dial 26 on the rear face thereof provided with indicator hands 27, movable back and forth over the face of the dial for adjusting the alarm attachment of the time-piece, and an arm 28 is mounted on a post 29 that is geared to the alarm attachment by a mechanism, not shown, as it forms no part of my present invention, and said arm carries an anti-friction roller 30. This arm revolves with the post 29 when the alarm attachment of the time-piece is released. The link 20 is provided at its lower end with a stud 31. A plate 32, preferably T-shaped, is pivoted at one end on a stud 33 mounted in the lower portion of the plate 16 and having its opposite end mounted on the stud 31. The outer face of the head of the

plate 33 is provided with recesses or depressions 34 adapted to receive ribs 35 provided in the ends of the arms 36 and 36a. These arms are provided with angular extensions 37 mounted on the stud 31 and having outwardly projecting cam shaped flanges 38 and 39, one upon each side of the arm 28 and the roller 30.

The depressions 34 are arranged in groups and spaced to represent degrees, and graduations are preferably placed adjacent to these depressions corresponding to those on the thermostatic plate and indicating the proper adjustment of the arms 36 and 36a to obtain the desired degree of adjustment for the thermostat. These graduations are on opposite sides of the supporting stud 33 of the plate 32 and the arms 36 and 36a are moved back and forth toward and from the axis of the plate 32 to adjust the flanges 38 and 39 into or out of the path of the roller 30. If the arms are adjusted as shown in Fig. 1, the shifting mechanism will be in its neutral position, the thermostat being set for 70 degrees and the arms 28 revolving without moving the flanges 38 and 39. When the arms 36 and 36a are moved outwardly on their graduations, the flanges at the opposite ends thereof will be swung inwardly toward the roller 30 and the contact of the roller with the flanges will shift the plate 32 and move the link 20 lengthwise to rock the arm 18 and move the contact points to the desired adjustment. Hand adjustment may be effected at any time by turning the post 10, the plate 32 oscillating on its pivotal support to allow the link 20 to follow the adjustment of the arm 18.

In various ways the details of construction herein shown and described may be modified and still be within the scope of my invention.

I claim as my invention:

1. The combination, with a thermostat having a manually operated adjusting means, of a time piece having an alarm attachment and a revolving arm connected therewith, a plate pivotally supported adjacent to one end in the rear of said time piece, members having a common pivot on said plate and cam surfaces upon opposite sides of said revolving arm to be actuated thereby when said arm is revolved, and means connecting said plate and members with said manually operated means for shifting it automatically for both day and night adjustment.

2. The combination, with a thermostat having a thermostatic bar and contact posts upon opposite sides thereof, and means for adjusting said posts with respect to said bar, of a time piece having an alarm attachment and a revolving member mounted on the back thereof and connected therewith, arms having cam surfaces upon opposite sides of said revolving member and concentrically mounted for movement independently of one another or simultaneously, and means connecting said arms with the adjusting means of said contact posts.

3. The combination, with a thermostat, including a manually operated shifting mechanism, of a time piece having an alarm attachment and a revolving member connected therewith, substantially L-shaped members having their short arms concentrically pivoted and provided with cam surfaces upon opposite sides of said revolving member, the oscillation of said arms on their pivot moving said cam surfaces into the path of said revolving member or out of the path of the same for varying the shifting periods of said thermostat adjusting mechanism, and means for connecting said members with said mechanism.

4. The combination, with a thermostat having contact posts and a shifting mechanism therefor, of a time piece having an alarm attachment and a revolving member connected therewith, arms concentrically pivoted and having cam surfaces upon opposite sides of said revolving member to be engaged and actuated thereby, a link connecting the pivot of said arms with said shifting mechanism, said pivot being movable simultaneously with said arms to permit manual adjustment of said shifting mechanism and said arms being movable independently of one another through the operation of said revolving member.

5. The combination, with a thermostat having contact posts and a shifting mechanism therefor, of a time piece having an alarm attachment and a revolving member connected therewith, a T-shaped plate supported near one end in the rear of said time piece and having graduations on opposite sides of said pivot, arms concentrically pivoted on said plate near its opposite end for independent movement on said graduations, said arms having cam surfaces upon opposite sides of said revolving member, and means connecting said plate with said shifting mechanism, said plate being free to oscillate on its pivot for manual adjustment of said shifting mechanism, said cam surfaces being out of the path of said revolving member when said arms are moved inwardly to the limit of said graduations, adjacent to the pivot of said plate.

6. The combination, with a thermostat having contact posts and a shifting mechanism therefor, of a time piece having an alarm attachment and a revolving member connected therewith, a plate pivotally supported in the rear of said time piece and having recesses representing graduations upon opposite sides of said pivot, arms pivoted on said plate at a point remote from the pivot of said plate and having means

for entering said recesses for locking said arms against premature movement, said arms having cam surfaces formed thereon upon opposite sides of said revolving member, the movement of said arms and the adjustment of said cam surfaces determining the time of engagement of said revolving member therewith and the periods for shifting the contact posts and means connecting said plate with said shifting mechanism.

7. The combination, with a thermostat having contact posts and a shifting mechanism therefor, of a time piece having an alarm attachment and a revolving member mounted on the back thereof and connected therewith, arms concentrically pivoted and having outwardly projecting flanges provided with cam surfaces upon opposite sides of said revolving member, said arms being movable independently of one another to adjust said cam surfaces toward or from said member, and means connecting said arms with said shifting mechanism.

8. The combination, with a thermostat having a manually operated adjusting means, of a time piece having an alarm attachment and a revolving arm connected therewith, a plate pivotally supported at one end, members having a common pivot on said plate and provided with long and short arms, the latter projecting upon opposite sides of said revolving arm and having cam surfaces to be engaged thereby, said plate having means for engaging and locking said long arms and a link connecting the pivot of said members with manually operated means.

In witness whereof, I have hereunto set my hand this 12th day of January 1916.

FREDERICK S. DENISON.