Oct. 6, 1925. 1,556,553

R. A. WOODWARD

TEMPERATURE COMPENSATOR FOR CLOCKS

Filed Dec. 11, 1924

FIG. 3

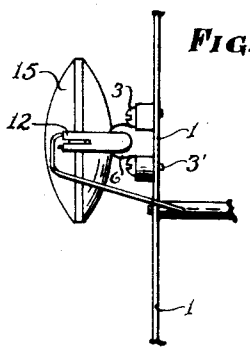
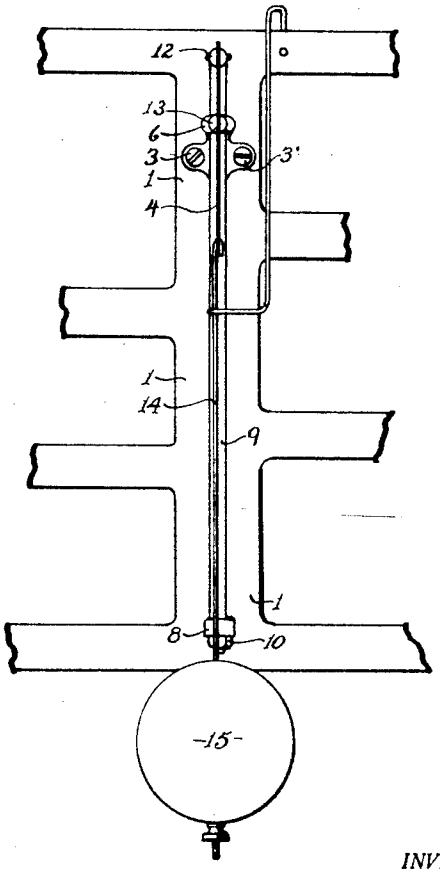


FIG. 1



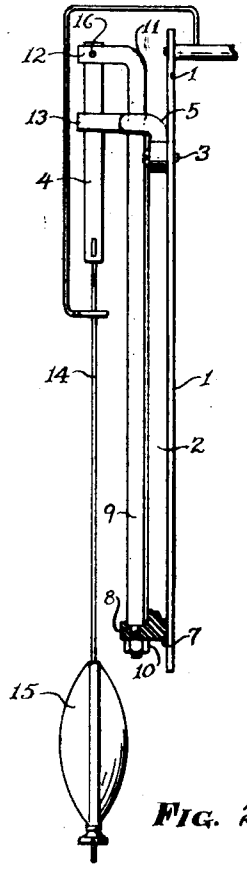


FIG. 2

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UNITED STATES PATENT OFFICE.

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TEMPERATURE COMPENSATOR FOR CLOCKS.

Application filed December 11, 1924. Serial No. 755,244.

To all whom it may concern:

Be it known that I, RICHARD A. WOODWARD, a citizen of the United States, residing in Geneseo, county of Rice, and State of Kansas, have invented new and useful Improvements in a Temperature Compensator for Clocks, of which the following is a specification.

My invention relates to a temperature compensator for clocks, and the objects of my invention are as follows;

First. To produce a temperature compensator, which is inexpensive and easy to manufacture.

Second. To provide a temperature compensator which is easy to install in clock mechanisms at the factory.

Third. To provide a temperature compensator which can be easily and readily installed in clocks which have already been manufactured without a temperature compensator.

Fourth. To provide a temperature compensator which is effective and accurate in its operations.

Referring to the drawings; Fig. 1 is a view looking in at the back of the clock showing my temperature compensator, mounted in place, on the movement plate of the clock. Fig. 2 is a side view of my temperature compensator. Fig. 3 is a view looking down on the top of my temperature compensator.

1 is the movement plate, on which is mounted a steel shaft 2, which is held in place by two screws, 3 and 3'. The upper end of the shaft 2 is bent outwardly at 5 and slotted at the end 13 to form a guide for the feather spring 4. Immediately after the shaft 2 is turned at the point 5, it is swelled as shown at 6 and a hole is drilled through the swelled portion to receive a shaft 9 which will be described later. The lower end of shaft 2 is bent outwardly at the point 7 to form a foot 8, through which is drilled a hole, the upper part of which is countersunk. A brass shaft 9 is slipped through the hole in the enlarged portion 6 and extends to the foot 8 where it seats in the countersunk hole, with a threaded end portion of the shaft 9 continuing through the foot 8 and is fitted with a nut 10 which holds the shaft 9 rigid with the foot 8. The upper end of the shaft 9 is bent outwardly at the point 11 being slotted at 12 to form the pendulum support. The feather spring 4 is suspended from the pin 16 of the pendulum support 12, and hangs in position in the pendulum guide 13. The lower end of the feather spring 4 supports the pendulum rod 14 and pendulum 15, the same as in ordinary construction.

The shafts 2 and 9 are made of materials whose co-efficients of expansion are unequal. Steel and brass mentioned in this specification are merely used for examples. My temperature compensator operates as follows; Assuming that the shaft 2, feather spring 4 and pendulum rod 14 are made of steel, and the shaft 9 is made of brass, the following action would take place under a rising temperature. The feather spring 4 and pendulum rod 14 would increase in length, which would tend to cause the clock to lose time, but the shaft 9, being made of brass, would expand or lengthen more than the shaft 2, thereby raising the point 16 which would slide the feather spring up through the feather spring guide, thereby maintaining the proper length of the pendulum which insures the clock operating with no gain or loss of time. With a falling temperature, this is reversed.

It will be noted that this temperature compensator is held in place with only two screws 3 and 3', which makes it possible to install this temperature compensator on clocks which have no temperature compensator, with very little trouble. It is only necessary to drill two holes in the movement plate to receive the two screws 3 and 3'.

Owing to the simplicity of construction and the small amount of material required, it is obvious that the cost of producing my temperature compensator is reduced to the minimum.

Such modifications may be made as lies within the scope of the appended claims, and having thus described my invention, what I claim as new, and desire to secure by Letters Patent is;

1. In a temperature compensator for clocks, a vertical shaft having its upper end horizontally disposed and vertically slotted and a hole as a bearing in said horizontal portion, said shaft having its lower end horizontally disposed and recessed and perforated in vertical axial alignment with the hole through the upper portion thereof; a second shaft, having a coefficient of expansion differing from that of the first mentioned shaft; the said second

shaft being housed within the hole in the upper portion of the first shaft and with its base anchored within and rigidly secured to the recessed base of the first shaft; said second shaft having its upper end portion horizontally disposed and inwardly slotted and arranged immediately above the corresponding parts of the first shaft, as a pendulum support.

2. In a temperature compensator for clocks, a vertical shaft having its upper end horizontally disposed and vertically slotted and a hole as a bearing in said horizontal portion, said shaft having its lower end horizontally disposed and recessed and perforated in vertical axial alignment with the hole through the upper portion thereof; a second shaft housed in the bearing of the first shaft and anchored to the recessed base thereof, said second shaft having its upper end portion horizontally disposed and inwardly slotted and arranged directly above the corresponding parts of the first shaft; a feather spring attached at the slotted end of the second shaft and arranged within the slotted guide of the first shaft, a pendulum rod and pendulum depending from said feather spring; the coefficient of expansion of the second shaft differing from that of the first shaft, feather spring and pendulum rod as indicated.

3. In combination as a temperature compensator for clocks; a movement plate; a vertical shaft having its upper end horizontally disposed and vertically slotted and a hole as a bearing in said horizontal portion; means for attachment of the vertical rod to the movement plate adjacent the upper vertical horizontal portion of said shaft and so that the lower and major portion of the said shaft depends therefrom free from the movement plate and with its lower extremity horizontally disposed as a recessed perforated base element in vertical axial alignment with the hole bearing in the upper horizontal portion; a second shaft arranged in the hole bearing of the first shaft and with its base anchored within the recessed base of the first shaft, said second shaft having its upper end portion horizontally disposed and inwardly slotted and arranged directly above the corresponding parts of the first shaft; a feather spring attached at the slotted end portion of the second shaft and guidingly arranged within the slotted end portion of the first shaft, a pendulum rod and a pendulum depending from said feather spring; the coefficient of expansion of the second shaft differing from that of the first shaft, feather spring and pendulum rod, as indicated.

RICHARD A. WOODWARD.