April 30, 1957 J. J. MORSCH 2,790,323

TEMPERATURE-ACTIVATED DEVICES

Filed April 19, 1954

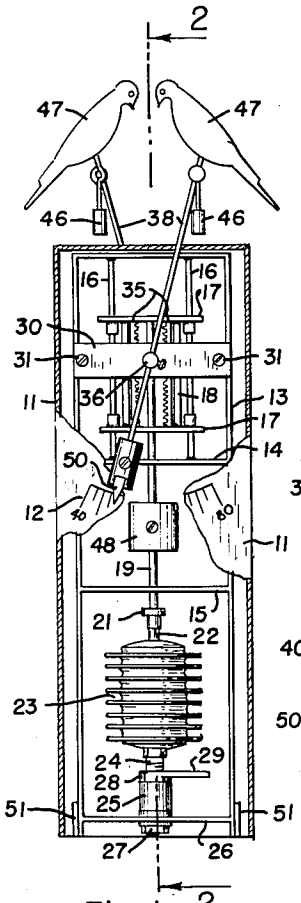


Fig. 1

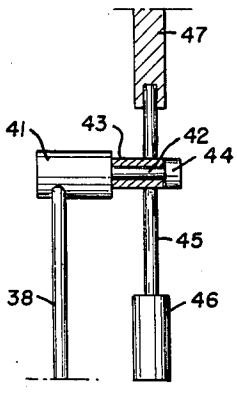


Fig. 5

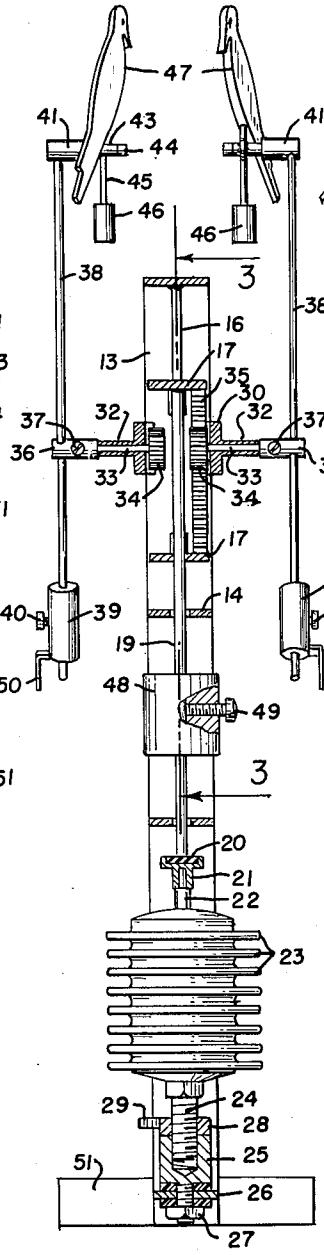


Fig. 2

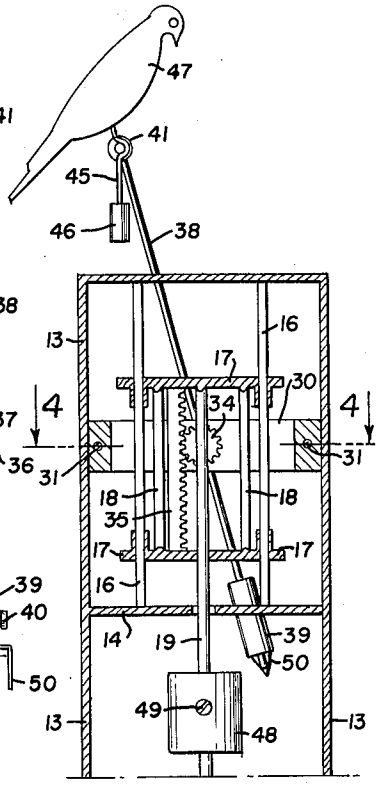


Fig. 3

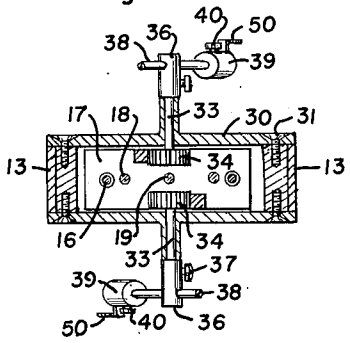


Fig. 4

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United States Patent Office 2,790,323 Patented Apr. 30, 1957

2,790,323

TEMPERATURE-ACTIVATED DEVICES

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Application April 19, 1954, Serial No. 424,000

3 Claims. (Cl. 73—339)

This invention relates to a thermometer, and has for its principal object the provision of a temperature-responsive device which will move miniature figures toward and away from each other to give a visual indication of the changes in the surrounding temperatures.

Another object is to provide a temperature-actuated mechanism which will give both a scale indication of the temperature and a visual indication by means of moving figures.

A further object is to provide a highly efficient adjusting mechanism for presetting the thermometer at an accurate basic temperature.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a front view of the improved temperature-indicating device, with its housing partially broken away to illustrate the interior construction;

Fig. 2 is an enlarged, vertical section through the operating mechanism removed from the housing, taken on the line 2—2, Fig. 1;

Fig. 3 is a similarly enlarged, vertical section through the upper portion of the operating mechanism, taken on the line 3—3, Fig. 2;

Fig. 4 is a cross-section looking downwardly on the line 4—4, Fig. 3; and

Fig. 5 is a still further enlarged detail section, illustrating a type of pivot member employed in the device.

The improved temperature-indicating device is designed to be positioned in any suitable ornamental housing 11 provided on its front face with an arcuate temperature-indicating scale 12. The operating mechanism is mounted in a vertical, rectangular frame 13 within the housing. The frame 13 is provided with vertically spaced cross members 14 and 15 and a bottom member 26 and is supported in an upright position by means of foot bars 51 secured to the bottom of the frame and extending oppositely outward therefrom.

Two vertical, parallel slide rods 16 extend between the top of the frame 13 and the upper cross member 14. The slide rods 16 act as guides for a vertically movable cross head, consisting of top and bottom plates 17 held in spaced relation by means of vertical spacers 18. The top and bottom plates are slidably mounted on the slide rods 16, and the entire cross head is supported on a central actuating rod 19. The rod 19 is rigidly secured at its upper extremity in the cross head and extends through openings in both cross members 14 and 15, terminating below the latter. A main counterweight 48 is mounted on the central actuating rod 19 by means of a suitable set screw 49.

The actuating rod 19 rests upon a resilient cushion 20 in a seat fitting 21 which is mounted on a spindle 22 extending upwardly from a temperature-expansible, metallic bellows 23. The lower extremity of the bellows 23 is provided with a threaded stem 24 which is threaded into a base member 25. The base member 25 is fixedly secured on the bottom member 26 of the frame 13 by means of a threaded stud and a suitable attachment nut 27.

The vertical position of the bellows 23 can be regulated by rotating it to thread the stem 24 upwardly or downwardly in the base member 25. The stem 24 can be locked at any preset vertical position by means of a jamb nut 28 threaded on the stem 24 above the base member 25 and provided with an actuating handle or lever 29. By screwing the jamb nut 28 tightly against the base member 25, the threaded stem 24 is locked in position.

A side plate 30 is secured across each side of the frame 13, by means of suitable screws 31, opposite the normal position of the cross head. Each side plate is provided with a tubular bearing 32 extending outwardly therefrom and a pinion shaft 33 is rotatably mounted in each of the bearings 32. Each pinion shaft 33 terminates at its inner extremity in a toothed pinion 34. Each pinion 34 is constantly in mesh with a toothed rack bar 35. The rack bars 35 are vertically secured between the top and bottom plates 17 of the cross head structure, and are so positioned as to be on opposite sides of the two pinions 34 so that upward movement of the cross head will rotate the two pinions in opposite directions.

A hollow cap member 36 is secured on the outer extremity of each pinion shaft 33 in any desired manner, such as by means of set screws 37. A teeter rod 38 extends through each cap member 36 and projects upwardly and downwardly therefrom a counterweight 39 is adjustably secured on the lower extremity of each teeter rod 38 by means of a suitable set screw 40.

A cylindrical shaft block 41 is mounted on the upper extremity of each teeter rod. Each shaft block supports a short, fixed, horizontally-positioned pivot shaft 42 upon each of which a rotatable sleeve 43 is held by means of a terminal head 44. A stem wire 45 is bent about each of the rotatable sleeves 43 and is soldered or otherwise secured thereto so as to project above and below each pivot shaft 42. A small counterweight 46 is mounted on the lower extremity of each stem wire 45 to maintain the latter vertical by gravity. An ornamental figure 47 of any suitable type is mounted on the upper extremity of each of the stem wires 45. As illustrated, the figures comprise simulations of doves.

Let us assume that the device is set up and properly adjusted, and that the surrounding temperature increases. This will act to expand the temperature-responsive bellows 23, causing it to force the seat fitting 21 upwardly, thereby transmitting an upward movement through the rod 19 to the cross head structure. This causes the toothed rack bars 35 to rotate their respective pinions 34 in opposite directions, to cause the two doves to separate.

It can be seen that it would be possible, by simply noting the relative position of the two doves, to determine major temperature changes. Accurate temperature changes can be noted by observing the position of an indicating pointer 50 on the scale 12. The pointer 50 is mounted on one of the counterweights 39 so as to indicate positions on the temperature indicating scale 12 on the housing 11.

While a specific form of the improvement has been described and illustrated herein, it is desired to be under-

stood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A mechanism of the class described comprising: a supporting frame; a temperature-responsive device mounted in the lower portion of said frame; a vertical actuating rod slidably supported in said frame by said temperature-responsive device; bearings supported by said frame on opposite sides of said actuating rod; a pinion shaft rotatably mounted in each bearing; a toothed pinion on the inner extremity of each pinion shaft; toothed racks supported from said actuating rod, there being one rack in mesh with each pinion, said racks being positioned on opposite sides of said pinions so that vertical movement of said actuating rod will rotate said pinions in opposite directions; and position-indicating devices mounted on sand shafts so as to move toward and from each other in consequence of rotation of said shafts so as to indicate the relative rotative positions of the latter, the parts of said mechanism being constructed and arranged so that both of said position-indicating devices are visible from points spaced from the planes of rotation of the said position-indicating devices and outside of said mechanism.

2. A mechanism as described in claim 1 in which the position-indicating devices comprise: a swinging teeter rod secured on and projectng upwardly from each of said pinion shafts; and a figure device mounted on each of said swinging rods.

3. A mechanism as described in claim 2 having said figure devices swingingly arranged on horizontal pivots and counterweights suspended from said figure devices for maintaining the latter vertical as the angle of said swinging rods varies.

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