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Gulko

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[54] **CONTINUOUS CAM CLOCK**

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[52] **U.S. Cl.** ..... **58/2;** 58/125 C; 58/127 R

[51] **Int. Cl.** **G04b 45/00;** G04b 19/02; G04b 19/06

[58] **Field of Search** ..... 58/2, 125 R, 125 C, 127 R

[56] **References Cited**

UNITED STATES PATENTS

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Primary Examiner—Edith Simmons Jackmon

[57] **ABSTRACT**

A continuous cam clock is provided in which a cylindrical tube is vertically supported on a base and rotated once an hour to display time in minutes, and a cylinder is positioned within the tube to rise slowly to display the hour as the tube rotates by the interaction between a continuous cam on the inside of the tube, and a pivotally mounted elongated follower carried by the cylinder.

4 Claims, 4 Drawing Figures

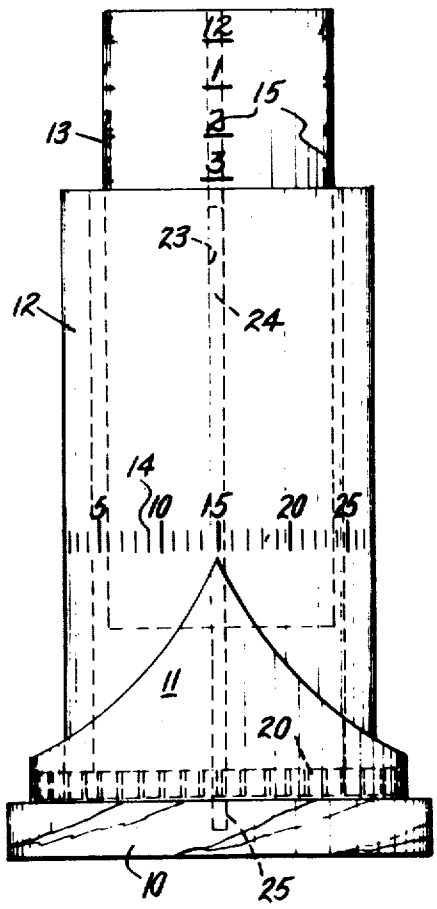


Fig. 1.

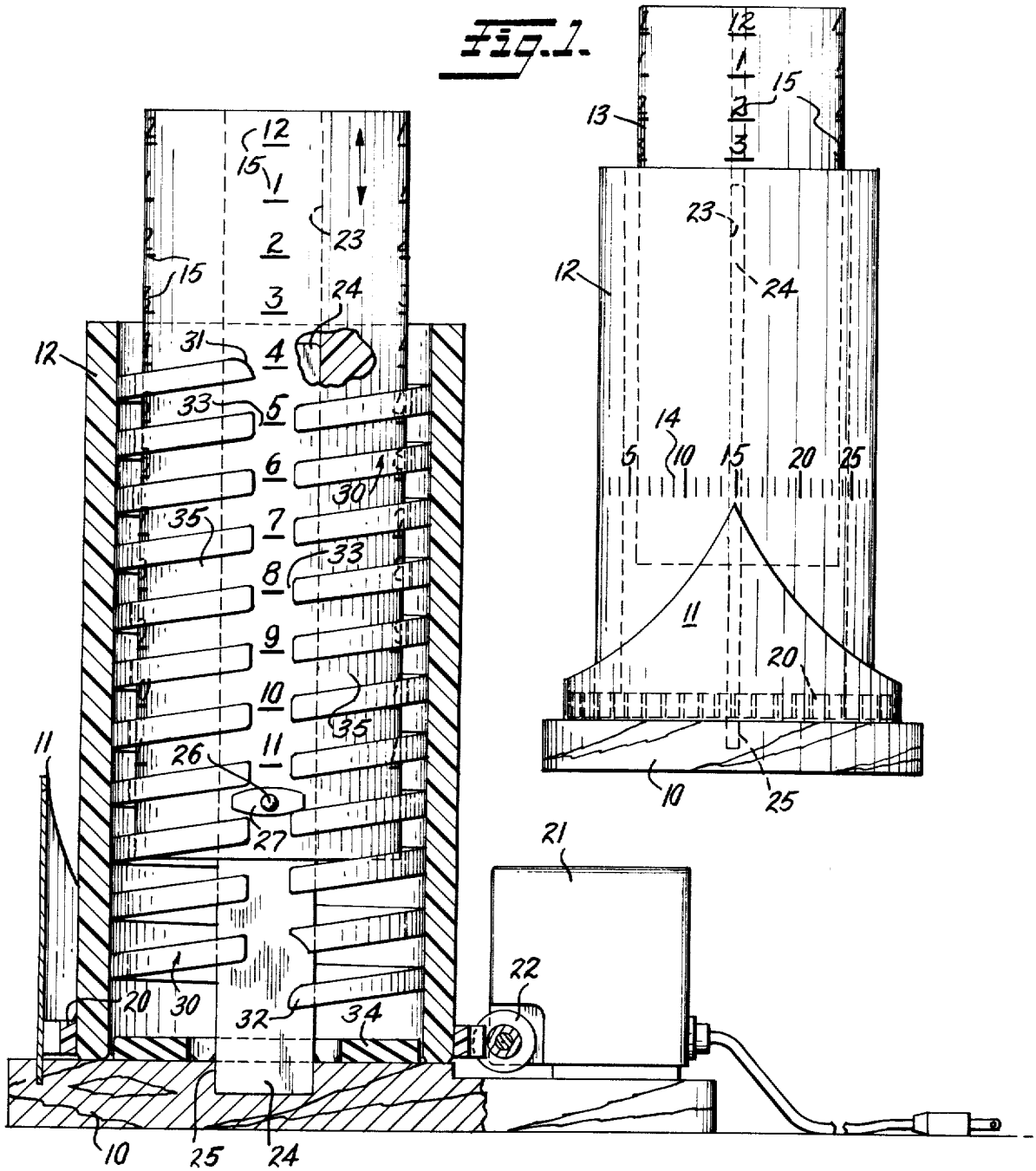

12
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Fig. 2.

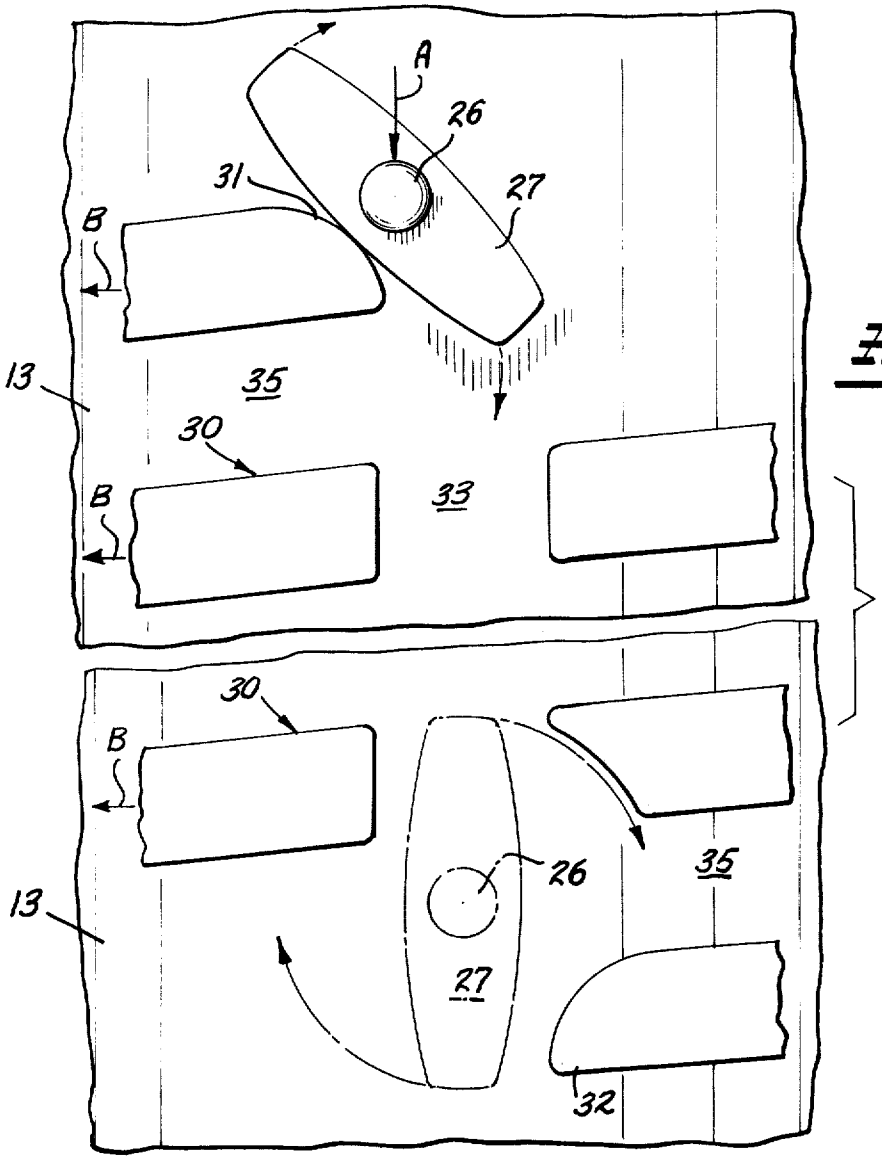


Fig. 3.

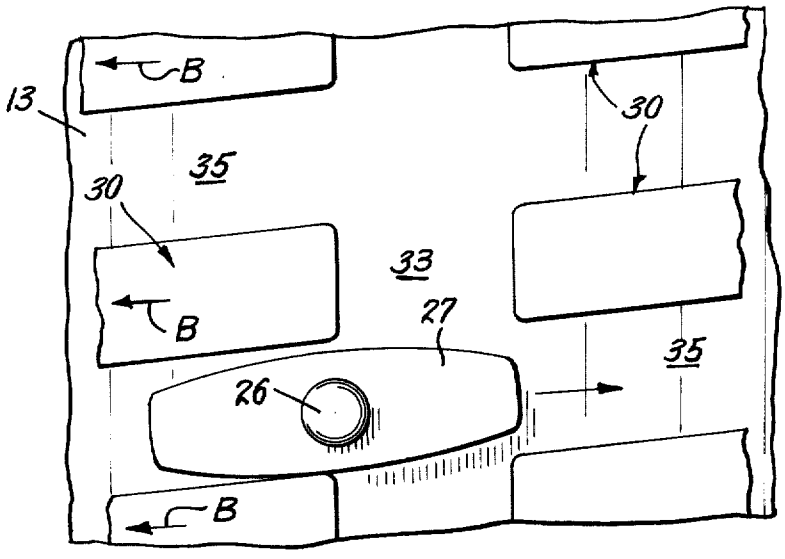


Fig. 4.

CONTINUOUS CAM CLOCK

The present invention relates to a clock having a different appearance and action and which is adapted to be displayed on a desk or mantle, or, in a larger size, to be displayed on the floor.

More particularly, in this invention a vertical tube rotates once an hour with an indicator in front of it to identify the minute of the hour. At the same time, a cylinder rises upwardly from within the tube, and this is used to identify the passage of time, hour by hour.

The foregoing is accomplished in this invention by having a cylindrical tube supported on a base with the axis of the tube perpendicular to the base, means being provided to rotate the tube once each hour. A cylinder is positioned within the tube, this cylinder being free for vertical movement, and means are mounted in the base to prevent the cylinder from rotating as it moves up and down within the cylinder. A continuous cam is carried on the interior of the tube and a follower is carried at the lower end of the cylinder to cause the cylinder to rise slowly as the follower rides up the cam.

The follower is elongated and mounted for pivotal movement so that it will not enter the vertical portion of the continuous cam until it reached the top of the cam. As a result, when the tube is rotated, the cylinder is forced to rise slowly until, at the end of a predetermined number of hours (normally 12), the follower will reach the top of the cam where it will drop down to lower the cylinder, whereupon the action will repeat itself.

The invention will be more fully understood from the accompanying drawing in which:

FIG. **1** is a front elevation showing an illustrative clock in accordance with this invention;

FIG. **2** is a side elevation on an enlarged scale, and partly in section;

FIG. **3** is a diagrammatic view showing a portion of the continuous cam and illustrating the manner in which the follower moves from the top of cam (where it ends one cycle) to the bottom of the cam (where it starts another cycle); and

FIG. **4** is a partial diagrammatic view further showing the construction of the continuous cam and illustrating the manner in which the pivotal follower bridges, the vertical portion of the continuous cam.

Referring to FIG. **1**, the numeral **10** identifies a base which may be constructed of wood and a pointer **11** is mounted thereon, the pointer **11** being desirably constituted by a curved piece of sheet metal which has an additional function to be pointed out hereafter.

Mounted freely on base **10** is a tube **12** which is vertically positioned as shown, and the minutes of an hour are imprinted in one form or another to extend around the circumference of the tube. The numeral **13** identifies a cylinder which is mounted for vertical movement around tube **12**. The minute identification on the tube **12** is identified at **14** and the hour identification on the cylinder **13** is identified at **15**.

Referring more particularly to FIG. **2** which pictures the structural coaction within the clock, it will be seen that the tube **12** sits on the base **10** and a spur gear **20** is fitted onto the lower end of the tube **12** to enable the tube to be rotated.

Rotation is accomplished by a motor **21** which drives a worm gear **22**, which slowly moves the spur gear **20** to rotate the tube **12** once per hour. Spur gear **20** is held in place against worm gear **22** by means of the metal sheet **11** which serves as the pointer to identify the minute of the hour in the manner pictured in FIG. **1**.

As can be seen in FIG. **2**, the cylinder **13** is formed with a rectangular slot **23** extending axally therethrough and a rectangular bar **24**, mounted on base **10** as shown at **25** extends upwardly through slot **23** to present rotation of cylinder **13**.

It will be understood that numerable variations in structure inside in **13** will be apparent to those skilled in the art.

Near the lower end of tube **13**, is mounted a pin **26** which pivotaly carries a follower **27**. This follower is enlongated so that it can negotiate the intricasies of the cam as will be described more fully hereafter.

Portions of the continuous cam identified generically by numeral **30** are shown in FIGS. **2** and **3**. The continuous cam is constituted by a helix having 12 turns, the follower **27** riding up the helix as the tube rotates, thus elevating cylinder **13** one flight per hour. The continuous cam thus has an upper end **31** and a lower end **32**.

The upper and lower ends **31** and **32** of the cam **30** are arranged at opposite ends of a vertical portion of the continuous cam identified at **33**. This vertical portion **33** cuts across the various flights of the continuous cam **30**.

The operation of the cam **30** will be seen with particular clarity in FIG. **3**, where the follower **27** will be seen in two positions, first at the top whereby it is about to fall off the upper end **31** of the cam **30** into the vertical portion **33**. An arrow A is shown bearing against the pin **26** to identify the weight of cylinder **13**.

As the follower moves through the vertical portion **33** driven by the weight of cylinder **13**, the cylinder **13** falls to the bottom of the cylindrical housing provided by the interior of tube **12**, and a spring or pad **34** is provided at the bottom around the bar **24** to cushion the fall. This places the follower **27** in the lowermost position shown in FIG. **3**, where rotation of cam **30** will cause the lower end **32** of the cam **33** to bear against the follower **27** and start it on its way up the first flight of the helical cam **30**. The rotating movement of cam **30** is shown by arrows B.

The details of the continuous cam **30** will be further evident from FIG. **4** where the horizontal portion **35** of the cam **30** is slightly smaller in width than the width of the vertical portion **33**. The greater width of vertical portion **33** eases the descent of follower **27** therethrough. Also, the distance from pin **26** to the remote end of the follower **27** is preferably larger than the width of the vertical portion **33** so that the follower **27** will traverse the vertical portion **33** to move across it until the follower reaches the upper end **31** of the cam as pictured in FIG. **3**.

The operation is quite simple. The tube **12** is rotated by motor **21** which drives spur gear **20** via worm gear **22** and thus caused to rotate once an hour, the minute being displayed at **14** and the hour being displayed at **15**.

The follower **27** is moved upwardly by the flights of the continuous cam **30** to elevate cylinder **13** and progressively reveal the hours displayed thereon at **15**.

When the follower **27** reaches the upper end of cam **31** it falls into the vertical portion **33** of the continuous cam **30** to allow cylinder **13** to drop, whereupon the

cycle begins again (twice each day in the embodiment illustrated).

The invention is defined in the claims which follow.

I claim:

1. A clock comprising a base, a cylindrical tube supported on said base with the axis of said tube being perpendicular to the base, means to rotate said tube, once an hour, a cylinder positioned within said tube and free for vertical movement therein, means mounted in said base for preventing rotation of said cylinder, a continuous cam on the interior of said tube and an elongated follower pivotally carried by said cylinder, said follower extending into said continuous cam whereby, upon rotation of said tube, said cylinder will rise one unit per hour so that the vertical position of the cylinder will identify the hour, and the rotational position of the tube will identify the minute of the hour.

2. A clock as recited in claim 1 in which said cylinder is formed with an axial rectangular slot and a bar is mounted on said base to extend through said slot to prevent rotation of said cylinder.

3. A clock as recited in claim 1 in which said continuous cam is formed as a helix with twelve horizontal flights which are crossed by a vertical portion through which said follower falls to permit said cylinder to descend.

4. A clock as recited in claim 1 in which a pointer serves to identify the minute of the hour and also to hold said tube in place as it rotates.

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