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INVERTABLE MECHANICAL TIMERS

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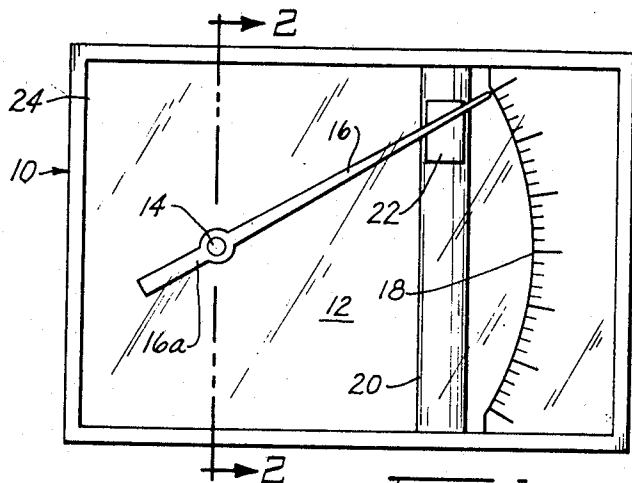


FIG. 1

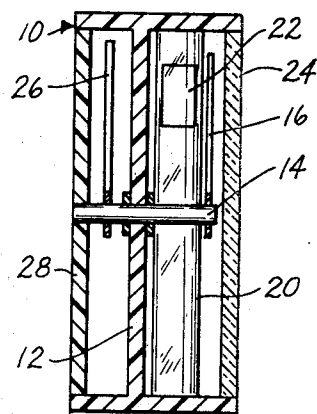


FIG. 2

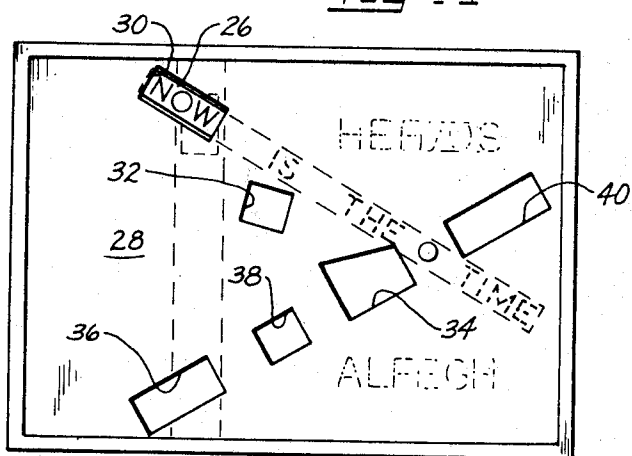


FIG. 3

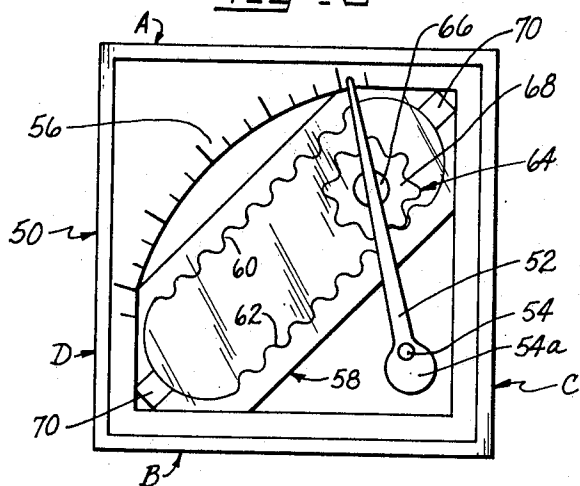


FIG. 4

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3,492,811 INVERTIBLE MECHANICAL TIMERS

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ABSTRACT OF THE DISCLOSURE

A mechanical timer having a piston body movable through a fluid confined in a transparent hollow tube to move time indicating means located externally of said tube.

The present invention relates to mechanical timers, especially to visually observed timing devices for indicating elapsed periods of time of the order of three minutes, and it also relates to such timers incorporated in advertising specialties, for producing attention-getting animated effects.

An object of the present invention resides in providing novel forms of timers whose operation involves intriguing effects. A related object of the invention resides in providing timers whose operation and use entails a kind of fascination for many people and which, accordingly, adapts the timer for use as an advertising specialty because of the attention it attracts.

A further object of the invention resides in providing a novel form of elapsed time indicator having a moving pointer and a fluid-column device for operating the pointer in a simple, reliable, rugged and non-critical manner.

A further object of the invention resides in providing timers of the aforesaid type in which the time-delay device involves a member that moves gravitationally in a column of viscous fluid, wherein the wall of the column is transparent and wherein the gravitational movable member immersed in the fluid is magnetically coupled to the pointer.

A further and related object of the invention resides in timers of the aforementioned types in which the pointer carries several parts of a sign which are successively exposed through apertures or windows, either individually or in combinations or, at the end of the timing interval, the words may be displayed concurrently. Articles of this form constitute attention-getting devices and they can accordingly be used effectively as advertising specialty devices.

A still further object of the invention resides in providing a novel form of timer having a column of relatively viscous liquid and a gravitationally movable member in the liquid, the wall that forms the column being transparent so that the gravitationally movable member can be observed, the member being rotatable, shaped like a gear, and having peripheral gear teeth that mesh with gear teeth along a side of the chamber so as to enforce rotation of the movable member during its gravitational movement, thereby to produce attention-getting effects.

A still further object of the invention resides in providing a timer having a four-sided body disposed in parallel pairs like the sides of a square or a rectangle, and a delay-timing column disposed slantwise in the timer so that the device may be moved from any one side at the end of the timing operation to another side for an ensuing timing operation; all four sides of the timer being usable in appropriate different timing cycles.

The nature of the invention and its further features and objects will be readily apparent from the following detailed description of two timers illustrating various fea-

tures of the invention. The two embodiments are shown in the annexed drawings, wherein:

FIGURE 1 is the front view of one form of timer pursuant to certain features of the present invention;

FIGURE 2 is a vertical cross-section of the embodiment in FIG. 1 as viewed from plane 2—2 in FIG. 1;

FIGURE 3 is a rear view of the embodiment of the invention in FIGS. 1 and 2; and

FIGURE 4 is a front view of another embodiment of the invention incorporating certain novel features found in FIG. 1 and, additionally, including other distinctive novel features.

Referring now to the embodiment in FIGS. 1 to 3 in the drawings, there is shown a timer that serves also as an advertising specialty. In FIG. 1, housing 10 which is conveniently of molded plastic has front and rear chambers separated by a central vertical wall 12 in which there is a bearing for the horizontal shaft 14 of a pointer or indicator 16. Pointer 16 is an indicator that moves along a scale 18 having graduations representing elapsed time. Behind pointer 16 there is a vertical transparent tube 20, preferably cylindrical, in which there is a permanent magnet 22. The upper and lower ends of this permanent magnet are oppositely polarized, in the example shown, and pointer 16 is of magnetic material, so that the pointer is attracted to and remains opposite to one end of permanent magnet 22. This magnet is a cylinder that has a relatively close fit in tube 20 that forms a cylindrical vertical chamber. The tube is filled with a transparent viscous fluid such as various silicone fluids, glycerine, motor oil or the like, which may be clear or tinted and in any event sufficiently light-transmitting so that magnet 22 surrounded by a thin film of fluid within the bore of tube 20 contrasts with the liquid above and below member 22. Members 16 and 20 are both of magnetic material and at least one of them (member 22, in this example) is permanently magnetized. Member 22 is considerably more dense than the liquid which it displaces and accordingly, member 22 tends to move down gravitationally in FIG. 20, being retarded mainly by the viscosity of the fluid and the small clearance between member 22 and the inner surface of tube 20. As the immersed magnetic member 22 moves down, pointer 16 remains in position opposite one end of body 22, and accordingly pointer 16 moves gradually from the top to the bottom of scale 18. Pointer 16 is balanced about its pivot by virtue of its counterweight part 16a. At the end of a timing period represented by the travel of body 22 from the top or virtually the top of column 20 to the bottom of that column, there is a timing cycle. After that cycle is over, the timer can be inverted for an ensuing timing operation.

The chamber containing pointer 16 and scale 18 and fluid-filled tube 20 has a transparent cover 24 for protective purposes, and in addition, this transparent cover can be imprinted with decoration or advertising material. The transparent tube containing the permanent magnet immersed in a viscous fluid together with pointer 16 is intriguing and tends to call attention to advertising appearing on cover 24.

Casing 10 contains another chamber at the opposite side of wall 12, and in this second chamber there is a sign 26 fixed on shaft 14. In the example given, the sign carries the inscription "NOW IS THE TIME." A cover 28 closes the second chamber in which sign 26 operates, and conveniently provides an additional pivotal bearing for shaft 14. Cover 28 has a number of openings in it, including opening 30 that is located to expose the word "NOW" when pointer 16 is in the position illustrated in FIG. 1. Another opening 32 is located to expose the word "IS" after the word "NOW" has moved away from opening

30. An additional relatively wide opening 34 is included for exposing the word "THE" after "IS" has passed beyond opening 32. At the end of the timing interval, sign 26 has all four of its words exposed by openings 36, 38, 34 and 40 formed in wall 28. Accordingly, one word at a time is exposed as sign 26 moves from its starting position as illustrated in FIG. 3 to the final position in which the complete sign is aligned with openings 36, 38, 34 and 40. As indicator 16 moves with the descending magnet 22, thereby to provide a timing interval, the words appear in succession: "NOW," "IS," "THE," and finally "NOW IS THE TIME." Further, as indicated, wall 28 may have advertising related to the animated sign "NOW IS THE TIME."

The various portions of the timer described have been found to possess a certain fascination for many people. The device shown and described is effective for measuring a time-interval, such as 3 minutes, and it is also effective as an animated display serving also as a timer.

FIG. 4 illustrates a second form of timer utilizing many of the features of FIG. 1. In FIG. 4, only the front of the timer is illustrated, whereas it is to be understood that the rear could be formed exactly in the manner shown in the embodiment of FIGS. 1-3. In the embodiment of FIG. 4, a casing 50 is shown that has two pairs of mutually perpendicular sides A, B, C and D. As illustrated, casing 50 is a square although the pairs of sides could of course be of unequal length so that it would be a rectangle, or the corners may be removed by slant cuts so as to form an octagon, or the corners could be replaced by very large radii. In any event, casing 50 is formed so that it can rest on any one of the sides A, B, C or D which meet at right angles.

Within casing 50 there is an indicator 52 that is supported on pivot 54 for movement along a scale 56. Indicator 52 has a counterbalance part 54a. Casing 50 also contains hollow member 58 that is elongated and is disposed substantially along a diagonal of the square casing 50. Member 58 has flat back and front walls, the front wall being transparent and being separated from the back wall by elongated sides providing opposite rows of gear teeth 60 and 62. Member 64 has a central magnetic part 66 and a peripheral part 68 formed with gear teeth adapted to mesh with teeth 62 or with teeth 60 depending on the position of casing 50. Pointer or indicator 52 is formed of magnetic material, as is part 66, and the latter is a permanent magnet in the timer illustrated. The axial end of magnet 66 opposite pointer 52 advantageously is one pole of a permanent magnet. The space between gear teeth 60 and 62 and between the front and back walls of member 58 is filled with a viscous liquid that may be transparent or translucent, and it may be tinted. The chamber containing part 66 may be filled, for example, by providing rubber plugs 70 at the opposite ends of unit 58, and using hypodermic needles for injecting the liquid at one end of the chamber and extracting air from the opposite end of the chamber until the entire chamber has been filled.

The density of the liquid is to be related to the mean density of member 64 that is immersed in the liquid so that member 64 is either lighter than, or heavier than, an equal volume of the liquid. Consequently, member 64 will move gravitationally in member 58, ascending or descending in dependence on its relative density. The diameter of member 64 is such that, while its gear teeth are in mesh with gear teeth 62 (for example), the gear teeth of member 64 do not reach gear teeth 60. Consequently, as member 64 moves gravitationally along gear teeth 62, member 64 not only descends (or ascends, depending on its density), but it also rotates as it travels along one of the rows 60, 62 of gear teeth in chamber 58. The pointer 52 follows magnet 66 during the travel of member 64 along the liquid column of member 58. The overall effect is such as to provide attention-getting effects that adapt the device to use as an advertising specialty; but as a mini-

mum, the device serves as a mechanical timer having an interesting dynamic effect.

After member 64 has descended (in the example illustrated) from the top of the liquid-filled chamber to its bottom, the timer can then be shifted to another of its sides so as to start another timing interval. Thus, by resting the timer on side C after member 64 has moved from the illustrated position to the lowermost extreme at the lower left of FIG. 4, then rotation of case 50 so as to rest on side C would institute another timing interval during which member 64 would move reversely along gear teeth 62. At the end of the same timing interval, wherein member 64 moves to the bottom of the chamber in the position of casing 50 illustrated, casing 50 can also be inverted so as to rest on side A. When this is done, then member 64 will descend and rotate as it descends, its gear teeth meshing with gear teeth 60. Notably, each time that member 64 moves from one extreme to the opposite extreme of chamber 58, the magnet 66 whose axial ends are oppositely polarized tends to move indicator or pointer 52 along scale 56, at the slow rate determined by the descent of member 64 in the chamber. Thus, where member 64 is more dense than the fluid-filling chamber 58, member 64 descends during each timing interval. In that case, pointer 52 moves counterclockwise about its pivot 54, along scale 56, during the time required by member 64 to travel to the lower extreme of chamber 58. Thereafter, by resting casing 50 on its side A or C, another timing interval would occur and pointer 52 would sweep along scale 56 in the opposite direction.

In the form of timer shown in FIG. 4, sides A and B are parallel to each other and perpendicular to the other parallel pair of sides C, D. Column 58 is disposed at a slant angle of approximately 45 degrees to each of the sides A, B, C and D. Consequently, the time interval is the same regardless of which side A, B, C or D serves as the supporting base. The sides could be related otherwise to each other, to substitute other slant angles for chamber 58 such as 30° or 60°, etc., changing the time interval accordingly. A timer having several pairs or sides at various angles to the liquid column is also contemplated, providing choice of timing intervals.

The part 68 of member 64 that is not a magnet may be of a light material (e.g., closed-cell foamed plastic) to give the gear 64 such a low mean density that it would ascend in the liquid that fills chamber 58, this being another gravitational motion.

FIGS. 1 and 4 both show illustrative forms of timers, each having a pivoted indicator that remains magnetically coupled to the magnetic timer. A timer as in FIG. 4, omitting the pointer and the magnet, remains intriguing and effective, and is itself useful as a timer.

The front of the casing in FIG. 4 may be covered with a clear panel, affording protection of the timer and providing space for advertising, as in the embodiment of FIGS. 1-3. The rear compartment of the timer in FIGS. 1-3 may be essentially duplicated in making timers like that in FIG. 4.

Variations of the invention as represented in the foregoing embodiment will be apparent to those skilled in the art, so that broad interpretation is warranted, consistent with the full spirit and scope of the invention.

What is claimed is:

1. A mechanical timer, including a stationary reference part, an indicator support for movement along said stationary reference part, and actuating means for said indicator, said actuating means including an elongated sealed chamber containing viscous fluid, and a pair of magnetic members one of which is immersed in said viscous fluid and has a weight that differs from an equal volume of the fluid and is thus adapted to move gravitationally therein, and the other of said magnetic members forming at least part of said indicator, at least part of one of said magnetic members being a permanent magnet for causing said indicator to move coordinately with the

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gravitational movement of said immersed magnetic member.

2. A mechanical timer in accordance with claim 1, wherein said chamber is an elongated column of essentially uniform cross-section and wherein said immersed magnetic member has a limited clearance from the inside surface of the column.

3. A mechanical timer in accordance with claim 2, wherein at least part of said immersed magnetic member is a permanent magnet.

4. A mechanical timer in accordance with claim 2, wherein said chamber has a transparent wall for displaying the immersed magnetic member during its gravitational movement.

5. A mechanical timer in accordance with claim 1, wherein said chamber is an essentially straight and vertical tube of transparent material and wherein said immersed magnetic member is a permanent magnet having only limited clearance from the inside surface of said tube and wherein said fluid is of lower density than said permanent magnet and is translucent so that said permanent magnet can be observed in its descent in said tube.

6. A mechanical timer in accordance with claim 1, wherein said indicator is a pivoted pointer and said stationary reference along which the pointer moves is a scale.

7. A mechanical timer in accordance with claim 1, wherein said indicator is a sign that bears a series of words and wherein said reference part has apertures therein for displaying all the words in one position of the indicator and for selectively displaying words of the sign in other positions of said indicator.

8. A mechanical timer in accordance with claim 1, wherein said immersed magnetic member has peripheral gear teeth and said elongated chamber has teeth meshing with said gear teeth, the meshing gear teeth being effective during the gravitational movement of the immersed magnetic member for causing rotation of the latter during its gravitational movement.

9. A mechanical timer in accordance with claim 1, wherein said immersed magnetic member has peripheral teeth and said elongated chamber is disposed slantwise in a body having mutually perpendicular pairs of parallel sides and having gear teeth along opposite elongated sides thereof adapted to mesh with the teeth of said immersed magnetic member, so that the immersed magnetic member can roll along one of the gear-toothed sides of the elongated chamber in moving gravitationally when the timer is stood on any of the sides of said body.

10. A mechanical timer in accordance with claim 9, wherein said chamber has a transparent wall so that the animated effect of the rotation and gravitational movement of said immersed member may be observed.

11. A mechanical timer, including an elongated chamber containing a viscous fluid, a member immersed in said fluid and adapted for rotation in said chamber and having peripheral gear teeth, at least one elongated side of said elongated chamber having teeth adapted to mesh with said gear teeth, said immersed member being of different weight than the volume of fluid that it displaces and is thus adapted to move gravitationally in said chamber and to rotate while in mesh with the teeth of said elongated side of the chamber, at least one side of said chamber being transparent for displaying the animation of said immersed member.

12. A mechanical timer in accordance with claim 1, wherein part of the said immersed magnetic member is made of magnetic material and another part thereof is made of a material of a much lower density than of said magnetic material for reducing the mean density of said immersed member below the density of said magnetic material.

References Cited

UNITED STATES PATENTS

3,171,245 3/1965 Breed ----- 58-144

RICHARD B. WILKINSON, Primary Examiner

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