

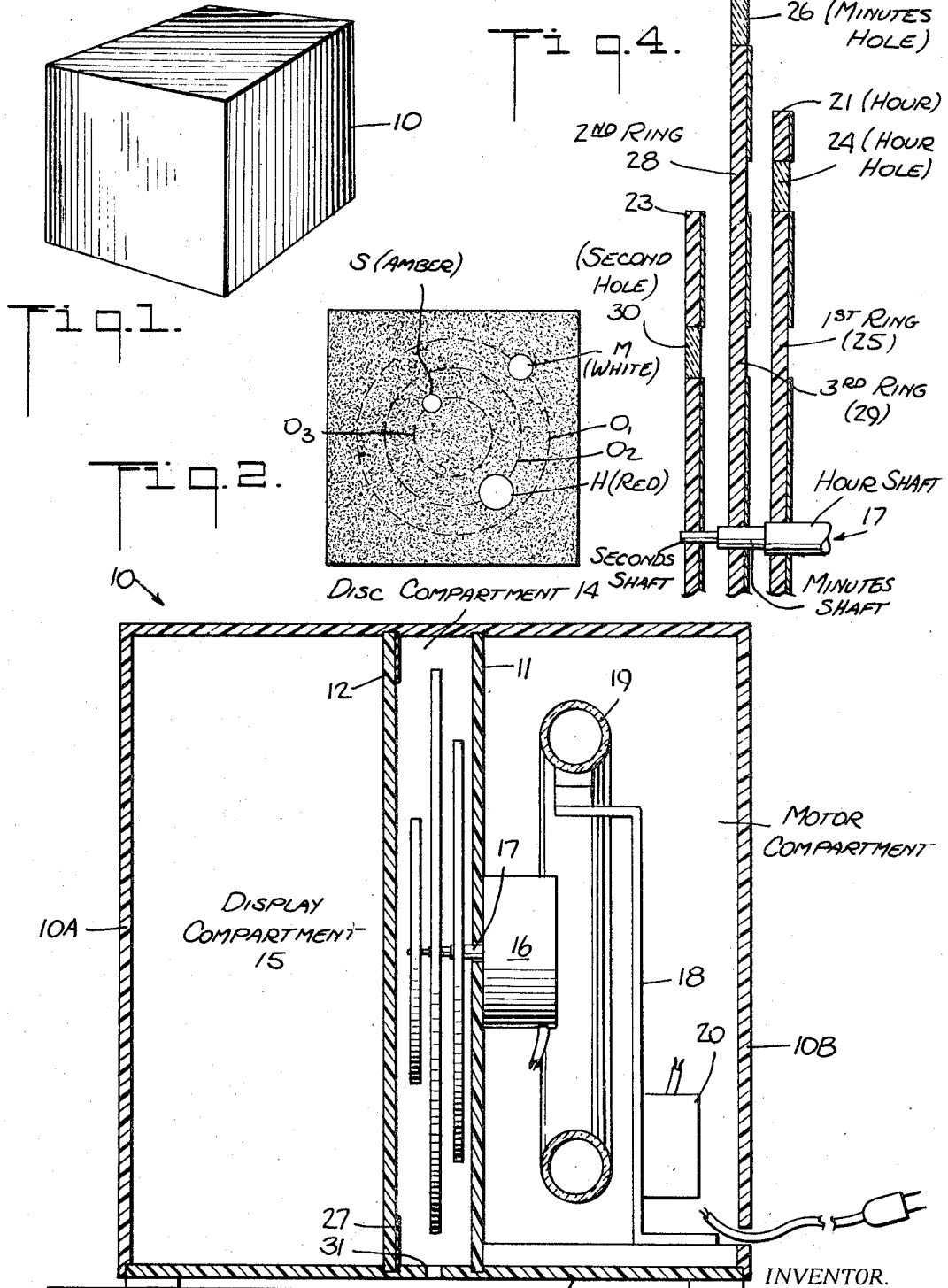
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G. T. LADAS
ORBITAL CLOCK

3,525,209

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2 Sheets-Sheet 1



INVENTOR.
 10C BY GEORGE T. LADAS
 Fig. 3. BY *Michael E. [Signature]*
 ATTORNEY

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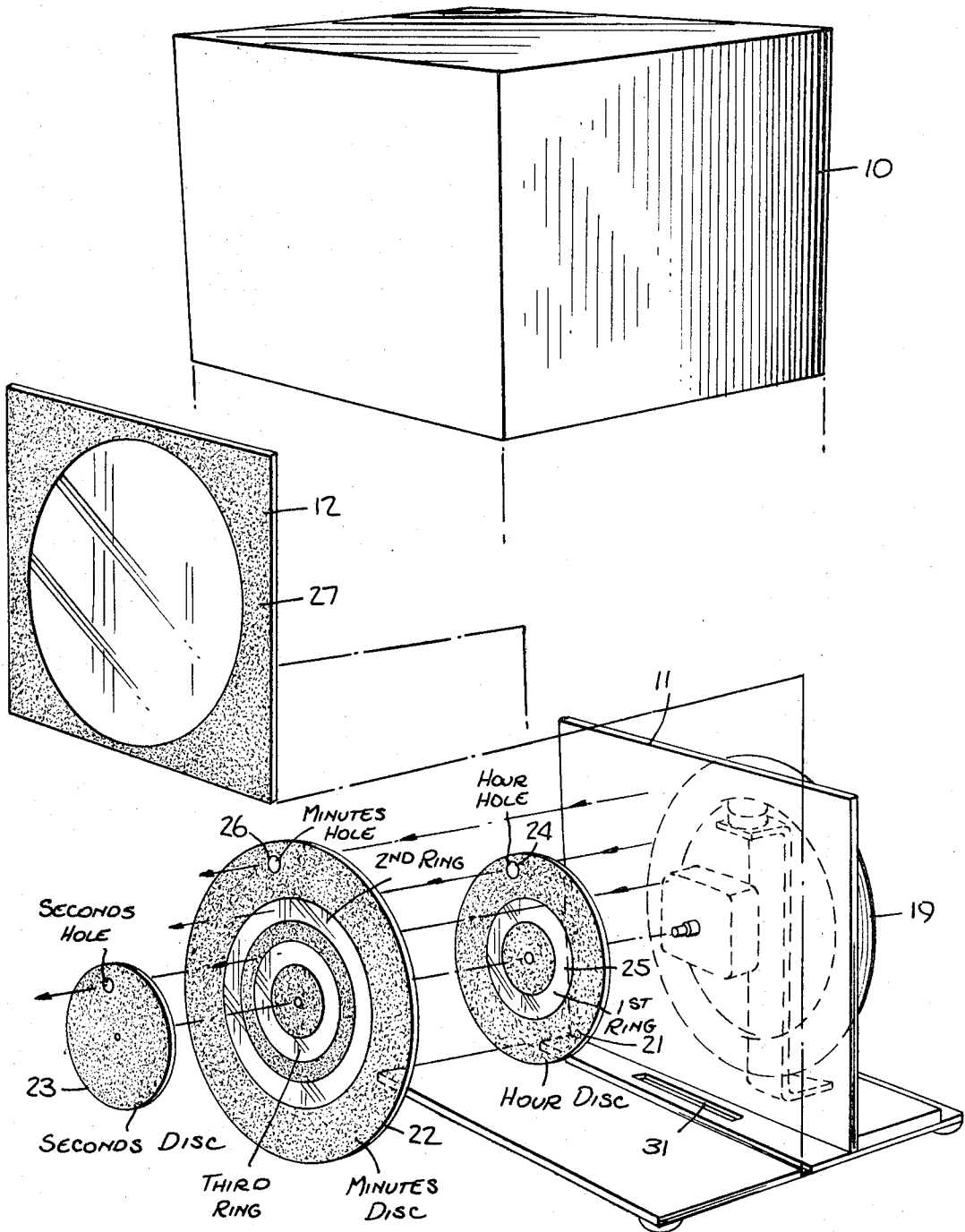


Fig. 5.

INVENTOR.
GEORGE T. LADAS
BY *Michael E. Kelly*
ATTORNEY

1

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ORBITAL CLOCK

George T. Ladas, 937 2nd Ave.,
New York, N.Y. 10017

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5 Claims

ABSTRACT OF THE DISCLOSURE

A clock in which the time display is produced by three luminous planets moving in concentric orbits and floating optically within a dark cube formed of acrylic material, the front panel of the cube being translucent, and the other panels being opaque. Movement of the planets is motor-controlled such that the outer planet makes one full revolution per hour to indicate minutes, the intermediate planet revolving once every twelve hours to indicate hours, and the inner planet once every minute to indicate seconds.

This invention relates generally to timepieces, and more particularly to a clock whose time indications are presented by luminous planets which appear to be orbiting in space.

In conventional clocks, the time display is almost invariably in the form of hands which turn at different rates to afford hour, minute and seconds indications. Because the observer has long been conditioned to read time in terms of angular position, all that he need know is the angular orientation of the pointers on a 360 degree scale, numerical indicia being superfluous.

Thus if the tip of the hour hand is at 90 degrees, the observer knows it is 3 o'clock without having to see the entire hand or the numeral 3. Similarly, if the tip of the minute hand is at 180 degrees, this is sufficient to advise the observer that the time is half past the hour. Consequently in some clock designs, the hands are masked to reveal only the moving tips along a circular scale.

The appearance of a standard clock, however modern its casing and however streamlined its time display, is nevertheless incongruous in a contemporary setting. The current trend toward minimal art involves a reduction in apparent detail in order to establish an environment in which mechanical, structural or electronic elements are obscured or submerged.

Living in a highly advanced technology in which the individual has little place, in order to regain his equilibrium and sense of personal worth, the individual seeks in his domestic environment to avoid the appearance of complexity without however sacrificing engineering advantages. Thus it is often the practice to house stereophonic high-fidelity equipment in cabinets of extreme simplicity having a so-called black light panel, which, in the absence of internal illumination, presents a perfectly blank mirror-like surface concealing the underlying dials and meters.

In minimal art, furnishings take the form of basic geometric shapes, such as slabs, cubes, cylinders and parallelepipeds, the shapes being adapted to function as beds, seats and sofas. Use is often made of grain-free plastic materials which may be transparent or translucent, rather than traditional woods or metals, again for the purpose of avoiding all ornamentation or display other than that imparted by the basic geometric form.

Accordingly, it is the main object of this invention to provide a clock having the form of a cube or other basic geometric form wherein time is displayed by three luminous planets floating optically within the cube in con-

2

centric paths, the relative positions of these bodies in their orbits being indicative of hours, minutes and seconds. While the clock in accordance with the invention satisfies contemporary aesthetic standards, it nevertheless functions as a timepiece.

More specifically, it is an object of the invention to provide a clock of the above-type in which the entire mechanism, including the means for setting time and all other elements which in a traditional clock are normally exposed, are concealed within a cube whose front panel is formed of dark translucent plastic and whose other panels are formed of dark opaque plastic, so that the observer sees only a pure geometric form free of all appendages, the time indications being nothing more than the luminous planetary elements which appear to float within the cosmos defined by the volume of the cube.

Also an object of the invention is to provide a clock of the above type which operates efficiently, reliably and quietly, sounds emanating from the clock-works being suppressed by the cube.

Briefly stated, these objects are accomplished in a clock having a timing motor mounted within a hollow cube formed by panels of dark translucent material which serve to conceal the internal mechanism and reveal only those elements which are illuminated. Rotatably mounted on the coaxial output shaft of the timing motor are three discs in spaced parallel relation, the outer disc being coupled to the seconds shaft, the intermediate disc to the minute shaft and the inner disc to the hour shaft.

Each disc is provided with a hole covered by an optical color filter, the holes being at different radial positions with respect to the common axis of the coaxial shaft, is that light rays emanating from a region surrounding the motor are projected through the holes to provide beams which are cast on a diffusion plate to create the effect of planets. The hour and minute discs are provided with transparent rings which register with the hole in the seconds disc to permit the passage of light therethrough, the minute disc being provided with an additional ring to permit the passage of light from the hour hole.

For a better understanding of the invention as well as other objects and further features thereof, reference is made to the following detailed description to be read in conjunction with the accompanying drawing, wherein:

FIG. 1 is a perspective view of a cube-shaped clock in accordance with the invention,

FIG. 2 is a front view of the clock,

FIG. 3 is a section taken through the clock,

FIG. 4 is a section taken through the rotating discs, and

FIG. 5 is an exploded view of the clock.

Referring now to the drawings and more particularly to FIGS. 1 and 2, there is shown a clock in accordance with the invention, the clock being encased in a cube, generally designated by numeral 10, formed of panels made of dark-grey plastic material, preferably an acrylic such as Plexiglas, only the front panel being transparent, the others being opaque. The nature of the plastic is such that in the absence of internal illumination, the cube appears to have a dark reflective surface, but when illuminated internally, the illuminated element may be seen within the cube, all other components being obscured.

The time display, as best seen in FIG. 2, can be observed only through the front panel 10A and is constituted by three luminous, differently colored planets M, H and S. Planet M, which in practice may be white, makes one full revolution per hour in a circular outer orbit O₁ and hence indicates the passage of minutes. Planet H, which is somewhat larger than planet M, completes a circular intermediate orbit O₂ once every twelve hours

and thereby provides the hour indication, this planet having, say, a red color. The smallest planet is planet S which revolves in the inner orbit O₃ once every minute and hence affords a seconds indication. This may be colored amber. Obviously the invention is not limited to the colors given by way of example, nor need the orbits be of different size.

Thus one may tell time by the relative angular positions of the three planets in their respective orbits. When for example, planet M is at 30 degrees, this indicates 5 minutes after the hour, when planet H is at 160 degrees this indicates the fifth hour and when planet S is at 300 degrees this indicates 50 seconds. Because the planets differ in color and size and also travel in distinctly separate orbits, no difficulty is experienced in reading time even though no scale or hands are provided. Thus the time display is minimal and yet adequate, all electrical and mechanical components being concealed.

The manner in which these results are accomplished can best be seen in FIGS. 3 to 5. The cube is divided by spaced partitions 11 and 12 into a motor compartment 13, a disc compartment 14 and a display compartment 15. Access to the motor compartment is by way of the rear panel 10B of the cube which is removable.

Centrally mounted on the rear of partitions 11, which is formed of white translucent acrylic material, is a timing motor 16 whose coaxial shaft 17 extends into disc compartment 14. Surrounding motor 16 in the motor compartment and supported from a bracket 18 is an annular fluorescent light bulb 19 operating in conjunction with a ballast 20. In practice, the required light may be furnished by suitable incandescent bulbs in any suitable arrangement.

The coaxial shaft 17 of the timing motor, as best seen in FIG. 4, comprises the usual tubular hour shaft 17A, a tubular minute shaft 17B telescoping within the hour shaft and a solid seconds shaft 17C. Mounted on the hour shaft is an hour disc 21, while mounted on the minute shaft is a minute disc 22 of larger diameter and on the seconds shaft is a seconds disc 23 of smaller diameter.

Formed in hour disc 21, adjacent the periphery thereof, is an hour hole 24 having a red filter thereon so that light rays from bulb 19 which pass therethrough have a red color imparted thereto. Also formed in disc 21 is a first ring 25 constituted by a transparent plastic.

In minute disc 22 there is a minute hole 26 adjacent the periphery thereof and covered by a white filter. Since this disc has the largest diameter, light rays which pass therethrough travel without interference through partition 12 into display compartment 15. Partition 12 is formed of translucent white acrylic material and is provided with an opaque mask 27 having a circular opening whose diameter is sufficient to expose minute hole 26.

Minute disc 22 is also provided with a second transparent ring 28 which is positioned in registration with hour hole 24 and lies just outside the periphery of the smallest disc 23, so that light passing through hour hole 24 which is colored red by the filter therein, is transmitted through the second ring 28 into the display compartment. Minute disc 22 also includes a third transparent ring 29 which lies in registration with the first ring 25 of the hour disc.

On the seconds disc 23 there is a seconds hole 30 having an amber filter therein, this hole lying in registration with the third ring 29 in the minutes disc and the first ring 25 in the hour disc. Thus light passes through the first and third rings and then through seconds hole 30 into the display compartment.

In order to set the clock, a slot is formed in the bottom panel 10C of the cube to provide access to the minute disc 22. By inserting a finger, one may adjust the minutes disc, as one ordinarily turns the minute hand of a clock, to set both the hour and minute hands.

The interior of the motor compartment is fully shielded, preferably with a sound-proofing material, so that the only light emanating therefrom is through the partition 11 into the disc compartment. Disc compartment 14 in turn only transmits into the display compartment three beams of light having different colors, the beams moving in circular orbits at appropriate timing rates. Because of the white translucent character of panel 12, which tends to somewhat diffuse the beams impinging thereon the observer does not see three sharply defined circles of light, but what appear to be planetary bodies whose outlines are soft and have a more cosmic quality so as to create the effect of planets orbiting in space.

In practice, instead of actual holes in the discs, one may make the discs of transparent material which is masked to define transparent openings and rings as required.

What I claim is:

1. An orbital clock comprising:

- (a) a box-shaped casing having a front panel formed of dark transparent material which conceals all components housed therein and yet permits observation of internally-illuminated bodies, and an intermediate translucent panel in parallel relationship to said front panel to form a display screen within said casing which is spaced from said front panel,
- (b) a timing motor mounted within said casing behind said intermediate panel, said motor having hour, minute and seconds shafts in a coaxial arrangement,
- (c) hour, minute and seconds discs mounted in spaced parallel positions on the corresponding shafts to rotate therewith, said discs being opaque, each having a transparent opening therein, said openings each being covered with a differently colored filter and being radially displaced relative to the common axis of said shafts, said hour and minute discs having transparent ring portions therein to admit light beams projected through said openings along axes parallel to said common axis to form images of said openings on said intermediate panel, and
- (d) a light source disposed behind said motor to produce said beams.

2. A clock as set forth in claim 1, wherein said discs are of different diameter, the seconds disc being smallest, the minute disc being largest and the hour disc being an intermediate size, and wherein the openings in the discs are adjacent the periphery thereof and are of different diameters.

3. A clock as set forth in claim 2, wherein said hour disc has one ring, and said minute disc has two rings, one of which is in registration with the ring in the hour disc and the seconds opening, the other of which is in registration with the hour opening.

4. A clock as set forth in claim 1, wherein said casing has a slot therein to provide access to the minute disc for setting the clock.

5. A clock as set forth in claim 1, wherein said discs are formed of transparent material and are rendered opaque by masks having transparent areas to define said openings and said ring portions.

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RICHARD B. WILKINSON, Primary Examiner
E. C. SIMMONS, Assistant Examiner

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