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Michaelis

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[54] **MEANS PROVIDING RANDOM MOVEMENT ESPECIALLY FOR USE IN LUMINOUS FOUNTAINS**

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[21] Appl. No.: **329,009**

[30] **Foreign Application Priority Data**

Feb. 10, 1972 France 72.04485

[52] **U.S. Cl.** ..... **239/23,** 40/106.22, 40/130 N

[51] **Int. Cl.** **B05b 17/08,** G09f 13/24

[58] **Field of Search** ..... 239/18–20, 239/23, 17; 84/464; 40/106.21, 106.22, 106.23, 130 N

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[57] **ABSTRACT**

A plurality of discrete discs of different specific gravity are guided for vertical movement in a transparent container. Random movement of the discs is initiated by introducing a liquid into the container at locations above and below the discs.

10 Claims, 9 Drawing Figures

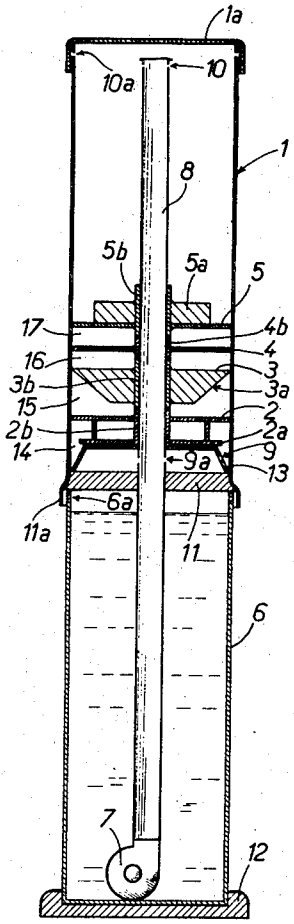


FIG.: 1

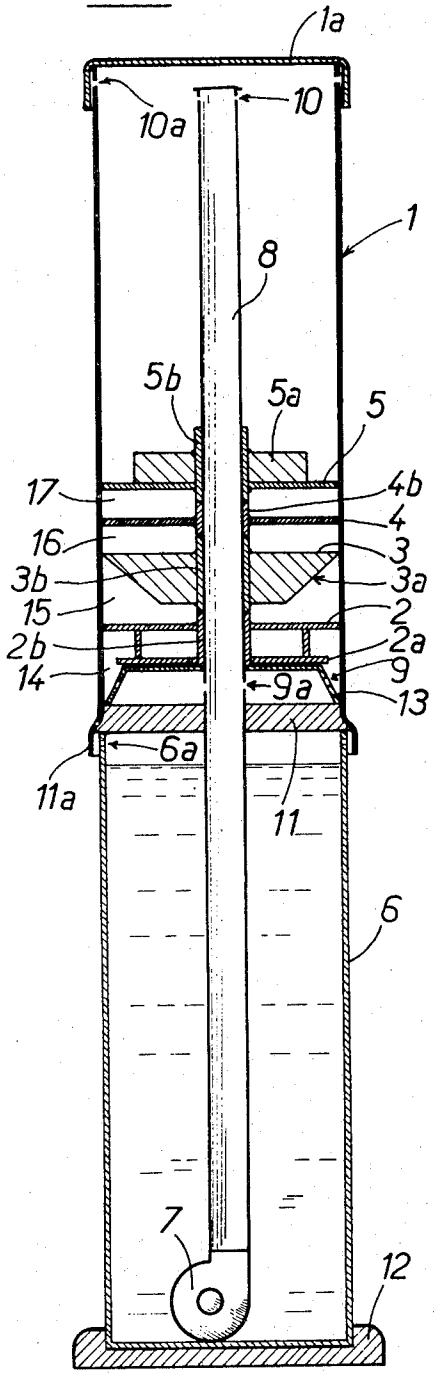


FIG.: 2

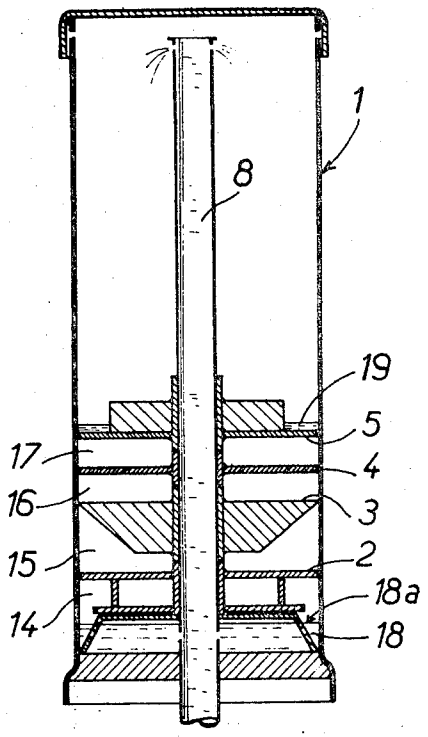


FIG.: 1a

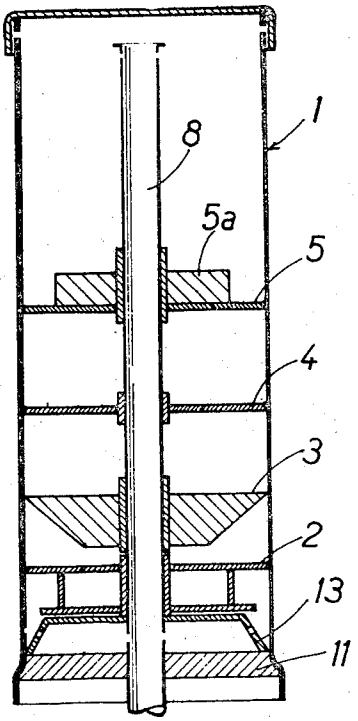


FIG.: 3

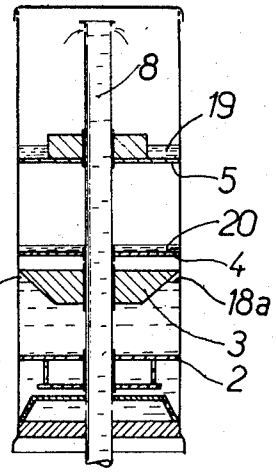


FIG.: 3a

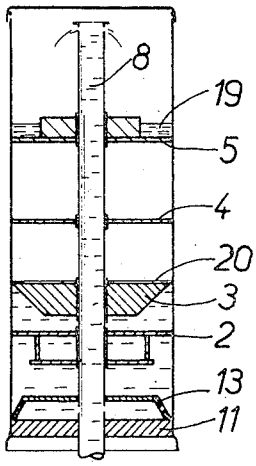


FIG.: 4

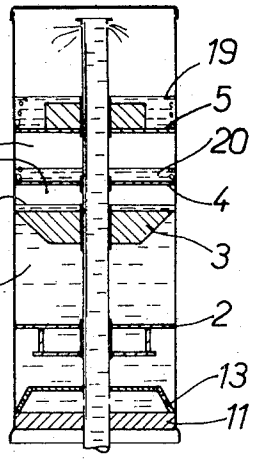


FIG.: 4a

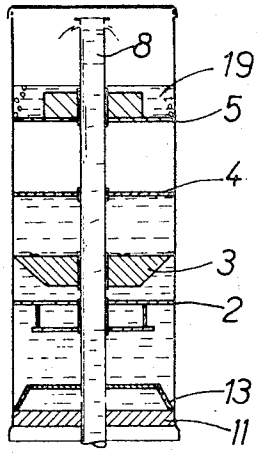


FIG.: 5

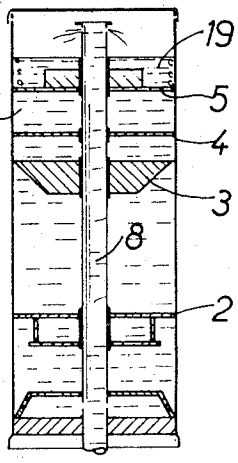
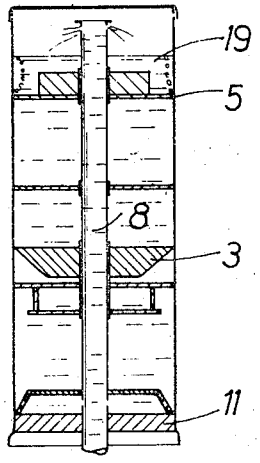


FIG.: 5a



MEANS PROVIDING RANDOM MOVEMENT ESPECIALLY FOR USE IN LUMINOUS FOUNTAINS

The invention concerns a means for imparting random reciprocatory movements to objects, and more particularly a means for causing random displacement of discs sliding within a cylinder. The invention relates in particular to the construction of luminous fountains which may be installed both indoors and in the open, especially for advertising purposes.

According to the present invention a random movement is imparted to a disc fitted to slide with gentle friction or without friction in a vertical cylinder, the movement being achieved by pushing upwards a cushion of air or other gas disposed below the disc, and by maintaining a layer of liquid on the disc. Then, sometimes uniform ascent of the disc is observed and sometimes unforeseeable accelerations or decelerations, accompanied by the release of air bubbles through the layer of liquid and/or movements of the liquid in the cushion of air are observed.

In one embodiment a plurality of discs are fitted in this manner to slide in a single vertical cylinder, the upper end of which communicates with the atmosphere. When not moving, the discs are kept apart by spacers. Means are provided for introducing liquid at the bottom of the cylinder and, preferably at a slower rate, at a point above the top disc, and for periodically emptying the cylinder. The discs may be guided by an element disposed along the axis of the cylinder. The guide element is preferably tubular so that it can be used as a pipe for the liquid which is discharged above the top disc.

Each of the discs is thus displaced in a random fashion both upwardly (during the filling of the cylinder) and downwardly (during emptying). For example, two adjacent discs may travel at the same rate during some movements, whereas they may move away from or towards each other during other movements. The space between two adjacent discs is sometimes full of air or liquid and sometimes occupied by a layer of liquid surmounted by a cushion of air.

By illuminating the interior of the cylinder, the wall of which is of course transparent, it is thus possible to provide a luminous foundain which attracts and arrests attention and which occupies the mind without fatiguing it. This effect can be further intensified by using different shapes and colours for the discs. Luminous fountains of this kind can be installed especially in waiting rooms and rest rooms or in public places so as to call attention to advertising matter.

Although the invention is in no way limited by any scientific explanation that may be put forward to explain its advantageous effects, these effects may result from the random differences in the gap between each disc and the cylinder and the guide element. In particular it might be thought that the presence of a layer of water on a disc could, in certain circumstances, tightly seal the annular gap or gaps, whereas in other circumstances that are practically unforeseeable, air might escape upwards and/or the water may travel downwards through the gap or gaps.

The following description relating to the attached drawing, provided to illustrate a non-limiting example, will show more clearly how the invention may be reduced to practice, all the details shown in the drawing and described in the text of course falling within the scope of the invention.

FIG. **1** is a diagrammatic vertical section through a luminous fountain which includes a plurality of discs in accordance with the invention, the discs being shown in the stationary condition.

FIG. **1***a* is a partial view similar to that seen in FIG. **1** and shows a possible position of the discs after emptying of the cylinder has been completed.

FIG. **2** is a partial view similar to that of FIG. **1** and illustrates the positions of the discs at the commencement of an operating cycle of the fountain.

FIGS. **3, 4** and **5** are views similar to that of FIG. **2** and show various positions of the discs at different moments during an operating cycle.

FIGS. **3***a*, **4***a* and **5***a* are views similar respectively to those of FIGS. **3, 4** and **5** and illustrating a further operating cycle.

The luminous fountain illustrated diagrammatically in FIG. **1** consists mainly of a cylinder **1** made of a transparent synthetic resin (methyl polymethacrylate) in which are slidably mounted discs **2, 3, 4** and **5** of the same material. There is provided a reservoir **6** containing a pump **7** capable of delivering water from the reservoir **6** to a tube **8.** Tube **8** is coaxial with the cylinder **1,** for the purpose of discharging the water into the cylinder at orifices **9** and **10** as will be explained below. The interior of the cylinder is illuminated by means not illustrated.

The discs **2, 3, 4** and **5** are of different colour and, with the exception of the disc **4,** are provided with appendages of various shapes so as to create further differences between them. Thus, a cylindrical portion **2a** constituting a float is attached to the lower face of the disc **2,** and the disc **3** is provided with a float **3***a*. Each of the discs **2, 3, 4** and **5** is mounted on a short length of tubing **2***b*, **3***b*, **4***b* and **5***b* respectively which extends thrugh a central aperture in its associated disc and is able to slide along the tube **8.** A radial gap of a few tenths of a millimetre is provided between the outer diameter of tube **8** and the inner diameter of each of the said short lengths of tubing. The periphery of each disc slides in the cylinder **1** and there is likewise provided a radial gap of a few tenths of a millimetre between the outer diameter of each disc and the inner periphery of the wall of the cylinder. The cylinder **1** is provided with a cover **1***a* and a water-tight base **11.** The lower portion of base **11** forms a cover **11***a* which rests on the reservoir **6.** The reservoir **6** is supported on a base-plate **12** and its upper edge contains air-holes **6***a*. The upper edge of the cylinder **1** likewise contains air-holes **10***a*.

Disposed above the base **11** of the cylinder is a limit stop **13** which forms a stop for the bottom disc **2.** That portion of the tube **8** which is situated within the limit stop **13** contains orifices **9***a*. The limit stop **13** itself contains orifices **9** which communicate with the interior of the cylinder below the bottom disc **2.** The upper end of the tube **8** is plugged but contains orifices **10,** the cross-sections of which are smaller than those of the orifices **9***a* and **9.** It is desired that only one-fifth to one-quarter of the amount of water delivered by the pump **7** is discharged through the orifices **10,** the rest being discharged through the orifices **9***a* and **9.**

The short lengths of tubing **2***b*, **3***b*, **4***b* and **5***b* constitute spacers which prevent the discs from moving into contact with each other. When the cylinder **1** con-

tains no liquid and when the lengths of tubing 2*b*, 3*b*, 4*b* and 5*b* rest upon one another (FIG. 1), there is provided air-filled gaps **14, 15, 16** and **17** as shown in the drawing. When the pump **7** is started up, a layer of water **18** is delivered (FIG. 2) at a relatively high rate below the disc **2,** and a layer of water **19** is delivered onto the disc **5.** As the water level **18***a* rises, air is compressed in the gap **14** and tends to lift the discs **2, 3, 4** and **5** on the layer of water **19.** However the air also seaks to pass through the annular gaps between the discs the cylinder **1,** and the tube **8,** and seeks to enter the spaces **15, 16** and **17** to be compressed therein. Such air then seeks to pass over the disc **5** and through the layer of water **19.** At the same time the water of this layer **19** seeks to flow downwards through said annular gaps.

The pump **7** is driven by an electric motor controlled by a timing system (the motor and system not being illustrated), so that the pump **7** is periodically caused to operate for a period (for example 1 minute) sufficient for filling the cylinder **1** with water. The pump **7** is then stopped for a length of time sufficient to enable the water to return from the cylinder **1** to the reservoir **6** by way of the orifices **9** and **9***a*, the tube **8** and the pump **7.** Since pump **7** is submerged, it does not require a non-return valve. FIGS. **3, 4** and **5** show respectively the positions that the discs might occupy **20, 40** and 60 seconds after the pump **7** has been started up. In FIG **3,** the level **18***a* of the water has risen beyond the disc **2** and has reached the float **3***a* of the disc **3** and helps define a cushion of air **15***a*. Part of the layer of water **19** has passed to a location below the disc **5** and forms a shallow layer **20** on the disc **4.** In FIG. **4** the level **18***a* has risen above the disc **3,** and below the disc **4,** and thereby helps define a cushion of air **16***a* which graudally escapes by bubbling through the layer of water **20.** The cushion of air **17***a* formed between the layer of water **20** and the disc **5,** likewise begins to escape through the layer of water **19,** thereby creating bubbles. In FIG. **5,** the level of the layer of water **18** has practically reached the disc **5,** and the air is finally driven from the cushion **17***a* through the layer of water **19.** When the pump **7** is stopped and the cylinder **1** completely emptied of water, the discs cannot be returned to the position shown in FIG. **1** but, probably as a result of their jamming slightly on their guides, occupy a position such as is illustrated in FIG. **1***a*. FIGS. **3***a*, **4***a* and **5***a* respectively also show the positions that the discs might occupy 10, 20 and 30 seconds after the pump has been started up a second time. It will be seen that the positions of the discs are very different from those shown in FIGS. **3, 4** and **5.** In particular the disc **3** seems to be towing the disc **2,** whereas in the previous Figures it appeared to be pushing the disc **4** upwards.

I claim:

1. A method of imparting random movement to attract attention comprising the steps of providing a plurality of discrete discs of different specific gravity in a transparent container with a gas between the discs, guiding said discs for vertical movement within said container, simultaneously introducing a liquid into the container at a location below a first one of the discs and at a location above a second one of the discs, permitting gas below the second disc to move upwardly through said liquid, and withdrawing liquid from said container.

2. A method in accordance with claim **1** wherein said step of guiding the disc includes using a hollow centrally disposed tube within said container, and said step of introducing liquid including pumping the liquid upwardly through said tube for discharge through ports in the tube.

3. A method in accordance with claim **1** including introducing less liquid above the second disc as compared with the amount of lqiuid introduced below the first disc.

4. A method in accordance with claim **2** wherein said step of withdrawing the liquid from the container includes passing the water downwardly through said tube into a reservoir at an elevation below the elevation of said container.

5. Apparatus for imparting a random movement to attract attension comprising a transparent container, a plurality of discrete discs of different specific gravity in said container, means in the container for guiding the discs for vertical movement, means for simultaneously introducing a liquid into the container at a location below a first one of the discs and at a location above a second one of the discs, and means for withdrawing liquid from said container.

6. Apparatus in accordance with claim **5** including a reservoir, said cylinder being supported by said reservoir, said reservoir containing a liquid to be introduced into said container, and pump means associated with the reservoir for pumping liquid from the reservoir into the container.

7. Apparatus in accordance with claim **5** wherein said means for guiding the discs includes a hollow tube coaxial with said container, said discs being annular and surrounding said tube, and said means for introducing a liquid into said container communicating with said tube, said tube communicating with said container at two locations at different elevations.

8. Apparatus in accordance with claim **7** wherein said means for providing communication between the tube and the container includes at least one upper orifice and at least one lower orifice, the upper orifice being smaller than the lower orifice.

9. Apparatus in accordance with claim **5** wherein at least one of said discs has a float attached thereto.

10. Apparatus in accordance with claim **5** including a vent opening at the upper end of said container for venting the upper end of said container to atmosphere.

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