

July 3, 1956

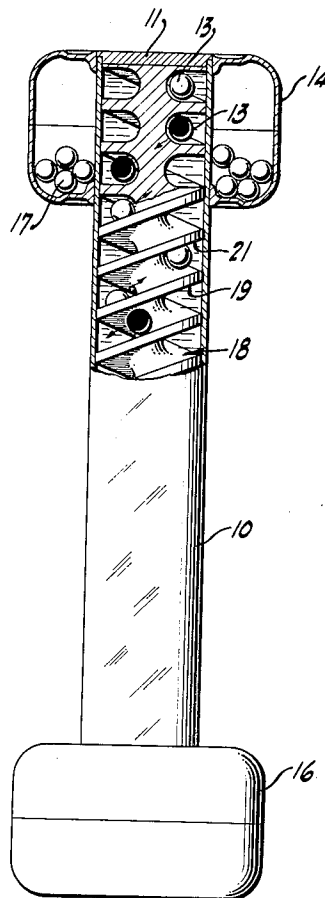
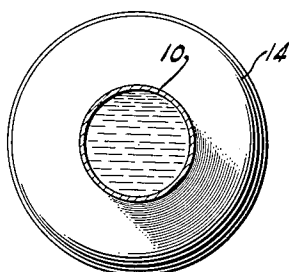
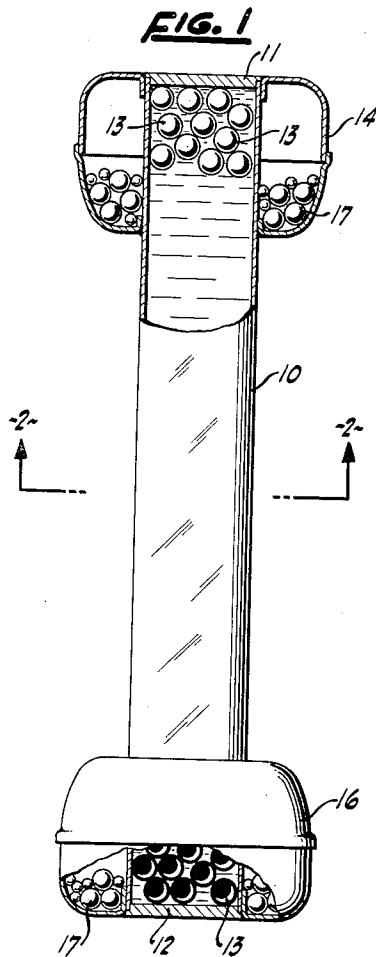
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2,752,725

FLUID FILLED CONTAINER WITH MOVABLE OBJECTS THEREIN

Filed Oct. 28, 1952

2 Sheets-Sheet 1



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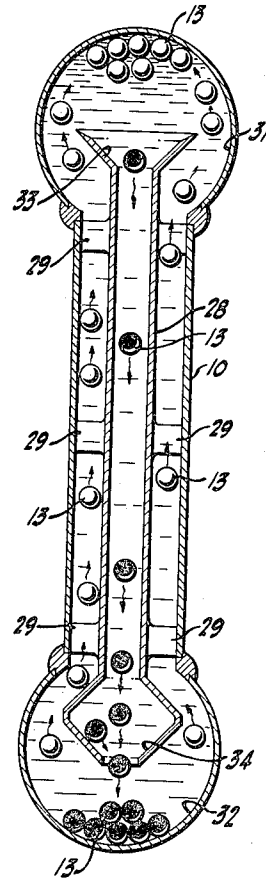
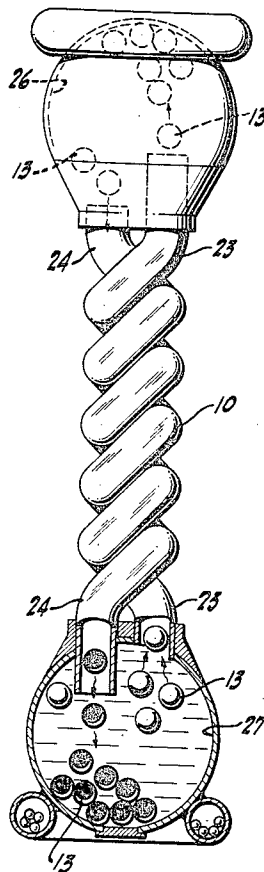
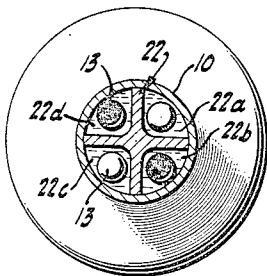
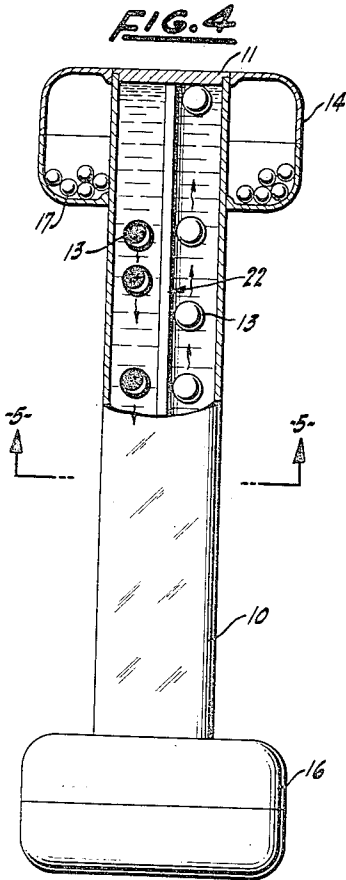
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FLUID FILLED CONTAINER WITH MOVABLE OBJECTS THEREIN

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2 Sheets-Sheet 2



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2,752,725

FLUID FILLED CONTAINER WITH MOVABLE OBJECTS THEREIN

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9 Claims. (Cl. 46—1)

This invention relates to a child's toy and particularly to a toy of the type which has a plurality of moving pellets or articles within a transparent housing which are adapted to vary their position within the housing upon movement of the same.

It is an object of this invention to provide a child's toy which is attractive to the eye and which is possessed of moving parts which cannot be reached, which cannot get out of order, and which cannot be lost. Those familiar with children's toys appreciate that when any of the three aforementioned conditions exist the chances are that the toy will become useless. Loss or misplacement of parts usually results in an incomplete toy or game. Exposure of the parts to handling usually results in the failure of the toy to function thereafter.

It is a further object of this invention to provide a toy which is attractive to the eye not only in its outside symmetry and appearance but in that it provides a fascinating and attractive movement of pellets which is sufficiently rapid to maintain interest and yet sufficiently slow so that the movement of the parts can be seen.

It is a further object of this invention to provide a device of this kind which is foolproof in its operation and simple to manufacture.

Still another object of the invention is to provide an educational device which utilizes certain well known physical principles and provides a self-explanatory manifestation of their principles.

Other objects and advantages of this invention will appear from the following specification taken in conjunction with the accompanying drawings in which:

Figure 1 represents a side elevational view partly in cross section of a device incorporating my invention;

Figure 2 is a cross sectional detail taken along the line 2—2 of Figure 1;

Figure 3 is a modification of the device illustrated in Figures 1 and 2 in which the moving members are confined to a plurality of spiral or helical raceways;

Figure 4 is a modification of the device illustrated in Figures 1 and 2 in which the moving members are restricted to a plurality of straight raceways;

Fig. 5 is a cross sectional detail taken along the line 5—5 of Fig. 4;

Figure 6 is a further modification of the device illustrated in Figures 1 and 2 in which the raceways for confining the movement of the movable members consists of a pair of twisted tubes; and

Figure 7 is a further modification of the toy illustrated in Figures 1 and 2 in which the downward movement of some of the particles is confined to an outer race and the upward movement of particles is confined to a coaxially aligned central raceway.

As illustrated in Figures 1 and 2, my device consists essentially of an elongated hollow member 10 in the form of a tube which is preferably made of a transparent material. The tube 10 is closed at both ends by caps 11 and 12 and is adapted to contain a predetermined quantity of

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fluid, either gas or liquid, of predetermined density or specific gravity.

The member 10 is also adapted to hold a number of moving elements or pellets 13. Some of these moving elements are lighter or of lesser density or specific gravity than the fluid within the member 10 while others of the movable members 13 are heavier or of greater density or specific gravity than the fluid within the member 10. This being the case it is apparent that the light members 13 will tend to find their way to the top of the member 10 while the heavier members 13 will tend to find their way to the bottom of the container 10. It is thus apparent that when the device is positioned as illustrated in Figure 1, the heavy members 13 will go to the bottom as viewed in Figure 1, while the lighter members will go to the top. If the apparatus is then reversed, end for end in such a manner that the closed end 12 is at the bottom and the closed end 11 is at the top, as viewed in Figure 1, the particles 13 will change their position and will tend to pass each other and be visible through the transparent side walls of the member 10. The appearance of the members 13 going upwardly or downwardly as the case may be, and passing each other, has a pleasing effect. In addition it is educational in that it teaches the child the fundamentals of the physical laws with respect to densities and specific gravities.

As illustrated it will be noted that the ends of the member 10 are also provided with circumferentially disposed annular housings 14 and 16 which are adapted to accommodate a number of pellets 17. These pellets 17 are contained within the housings 14 and 16 respectively and are not intended to move within the container 10. Their purpose is merely to provide a so-called "rattle" effect.

In the modification illustrated in Figure 3 the member 10 is provided with a spiral member 18 which provides a pair of helical raceways 19 and 21. The raceway 19 is adapted to accommodate one of the two types, either heavy or light, of movable members 13 while the other raceway is adapted to accommodate the other of the types of movable members. When the position of the device is reversed as indicated previously herein in connection with the modification illustrated in Figure 1, the light and heavy members move in their respective raceways 19 and 21 upwardly or downwardly in the fluid as the case may be. In its operation, the device illustrated in Figure 3 is substantially identical with the operation previously described in conjunction with the device illustrated in Figures 1 and 2 with the exception, however, that the light and heavy members do not move freely in the fluid but are confined to the raceways 19 and 21.

In the modification illustrated in Figures 4 and 5 the member 10 is provided with a member 22 which, as illustrated in Figure 5 divides the chamber 10 into four elongated and parallel raceways 22a, 22b, 22c and 22d. Each of the raceways 22a and 22d inclusive is adapted to accommodate one of the two types of moving members 13, that is either heavier or lighter than the fluid within the member 10. The movement of the members 13 upon reversal of the position of the device is substantially the same as previously described in conjunction with the devices heretofore mentioned.

In the modification illustrated in Figure 6 the member 10 is in the form of a pair of entwined, spiral, transparent tubular members 23 and 24 whose open ends lead into compartments 26 and 27 respectively. As indicated in Figure 6 one end of each tube enters the compartments 26 and 27 and terminates at a point at which it enters the compartments 26 and 27. The operation of the device illustrated in this figure is substantially the same as has been previously described. However, let it be as-

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sumed that the device has been positioned in such a manner that all of the lighter members are in the compartment 27 and the heavy members are in the compartment 26. The lighter members will tend to move upwardly and it has been found that few, if any, of them will enter the tube 24 which extends into the interior of the compartment 27 but that they will all enter the tube 23 whose opening is at a higher level than the opening of the tube 24. The light particles will then follow the tube 23 upwardly and be vented into the chamber 26 through the tube 23. The heavy particles in the compartment 26, however, will probably avoid the open end of the tube 23 which extends upwardly into the fluid within the compartment 26 and will find their way through the tube 24 into the compartment 27. Upon changing the position of the device from end to end a similar movement will occur.

In the device illustrated in Figure 7 a centrally aligned tubular raceway 28 is provided. It is supported by members 29 from the side walls of the member 10. Compartments 31 and 32 are provided at each end of the member 10 and the tubular member 28 is provided at one end with a funnel-shaped opening 33 and at the other end with a tapering closure 34. Both the funnel 33 and the tapering closure 34 enter and extend into the compartments 31 and 32 respectively. Let it be assumed that the position of the device has been changed in such a manner that the light members are in the compartment 32. They will tend to rise upwardly through the tubular member 28. The heavy members, however, will tend to by-pass the tapered end 34 and will pass downwardly around the outside of the tubular member 28. Reversal of the position will result in passage of the light members in the same manner.

It is apparent from the foregoing that the fluid within the device may be either a liquid or a gas, the specific fluid being governed only by the density or specific gravity of the two types of members 13 which are adapted to move through it.

I also wish to make it clear that in the event the fluid within the device is a gas, the members 13 may be hollow and filled with a lighter gas as, for example, helium. The utilization of helium filled devices and ordinary wax pellets in a tubular member filled with air will, of course, achieve the desired effect.

It is also apparent from the foregoing that I have provided a child's toy which possesses all of the advantages outlined herein in my statement of the objects of this invention.

I claim:

1. In a device of the character described, a pair of compartments, an elongated hollow connecting member between said compartments, a body of liquid within said compartments and said member having a predetermined density and a plurality of movable objects in said liquid, said elongated member having therewithin a coaxially aligned tubular member, one end of which is outwardly flared and the other end of which is outwardly flared and then inwardly flared.

2. A toy comprising a pair of compartments, an elongated hollow member connecting said compartments, a body of liquid having a predetermined density within said compartments and said member, a tubular member coaxially aligned within said hollow member, the length of said tubular member being somewhat longer than the length of said hollow member, one end of said tubular member being outwardly flared, a plurality of objects of a density slightly greater than the density of said fluid, and a plurality of objects of a density slightly less than the density of said fluid, said objects being disposed in said fluid.

3. A toy comprising a transparent elongated body, a liquid of a predetermined specific gravity within said body, a pair of twisted passageways within said body, two groups of balls of sufficient number to form a mass at

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each end of said body, one group of said balls having a specific gravity less than the specific gravity of said liquid, and the other group of said balls having a specific gravity greater than the specific gravity of said liquid, said balls being of comparable size and different colors and being adapted to move from one end of the body to the other as said elongated body is periodically inverted to give a kaleidoscopic effect, and means for mounting said passageways in said body in such a manner that the balls of one group will pass through one of said passageways and the balls of the other of said groups will pass through the other of said passageways when said body is inverted.

4. A toy comprised of a pair of chambers of transparent material, a pair of tubular members joining said chambers, said tubular members being intertwined and each having one end extending a substantial distance into opposite chambers, a liquid of predetermined specific gravity within said chambers and said tubular members, and two groups of balls of sufficient number to form a mass in each end of said chambers, one group of said balls having a specific gravity less than the specific gravity of the liquid and the other group of said balls having a specific gravity greater than the specific gravity of the liquid, said balls being of comparable size and different colors, the group of balls in one chamber passing through one of the tubular members, and the group of balls in the other chamber passing through the other of the tubular members to give kaleidoscopic effect as the toy is periodically inverted.

5. A toy comprising a transparent elongated body, a pair of passageways in said body, a liquid of a predetermined specific gravity within said body, and two groups of balls of sufficient number to form a mass at each end of said body, one group of said balls having a specific gravity less than the specific gravity of said liquid, and the other group of said balls having a specific gravity greater than the specific gravity of said liquid, said balls being of comparable size and different colors, and means for mounting said passageways in said body in such a manner that the balls at one end of said body will pass through one of said passageways and the balls at the other end of said body will pass through the other of said passageways as said elongated body is periodically inverted to give a kaleidoscopic effect.

6. A toy comprising a transparent elongated body, a transparent tube coaxially aligned within said elongated body and extending substantially the entire length thereof, a liquid of a predetermined specific gravity within said body, and two groups of balls of sufficient number to form a mass at each end of said body, one group of said balls having a specific gravity less than the specific gravity of said liquid and the other group of said balls having a specific gravity greater than the specific gravity of said liquid, means mounted on each end of said tube to cause the group of balls at one end of said body to pass through the tube and the group of balls at the other end of said body to pass between the tube and the body as the body is periodically inverted, said balls being of comparable size and different colors to give a kaleidoscopic effect.

7. A toy comprising a transparent elongated body, a pair of tortuous passageways in said body and extending from one end of said body to the other, a liquid of a predetermined specific gravity within said body and said passageways, and two groups of balls of sufficient number to form a mass at each end of said body, one group of said balls having a specific gravity less than the specific gravity of said liquid and the other said group of said balls having a specific gravity greater than the specific gravity of said liquid, one group of said balls being disposed in one of said passages and the other group of said balls being disposed in the other of said passages, said balls being of comparable size and different colors and being adapted to move from one end of the body to the other through said passages as said elongated body is periodically inverted to give a kaleidoscopic effect.

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8. A toy comprised of a pair of substantially spherical chambers of transparent material, a tubular member of transparent material joining said chambers, a liquid of predetermined specific gravity filling said chambers and said tubular member, and two groups of balls of sufficient number to form a mass in each of said chambers, one group of said balls having a specific gravity less than the specific gravity of the liquid and the other group of said balls having a specific gravity greater than the specific gravity of the liquid, said balls being of comparable size and different colors and being adapted to move from one chamber to the other through said tubular member as the toy is periodically inverted to give a kaleidoscopic effect.

9. A toy comprised of a pair of substantially spherical chambers of transparent material, means joining said chambers and providing a pair of passageways between said chambers, a liquid of predetermined specific gravity within said chambers and said passageways, two groups of balls of sufficient number to form a mass in each of said chambers, one group of said balls having a specific gravity less than the specific gravity of the liquid and the other

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group of said balls having a specific gravity greater than the specific gravity of the liquid, and means mounted on said means forming said passageways for causing the group of balls at one end of said body to pass through one of said passageways and the said group of balls at the other end of said body to pass through the other of said passageways as said toy is inverted, said balls being of comparable size and different colors to give a kaleidoscopic effect.

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