July 14, 1942. F. E. PARSONS 2,290,067

DIVING TOY

Filed Jan. 29, 1941

Fig. 1.

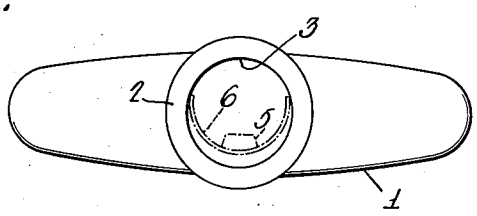


Fig. 2.

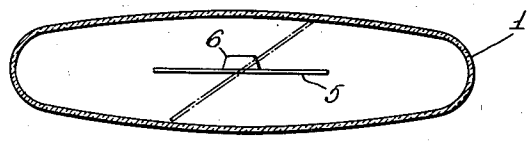
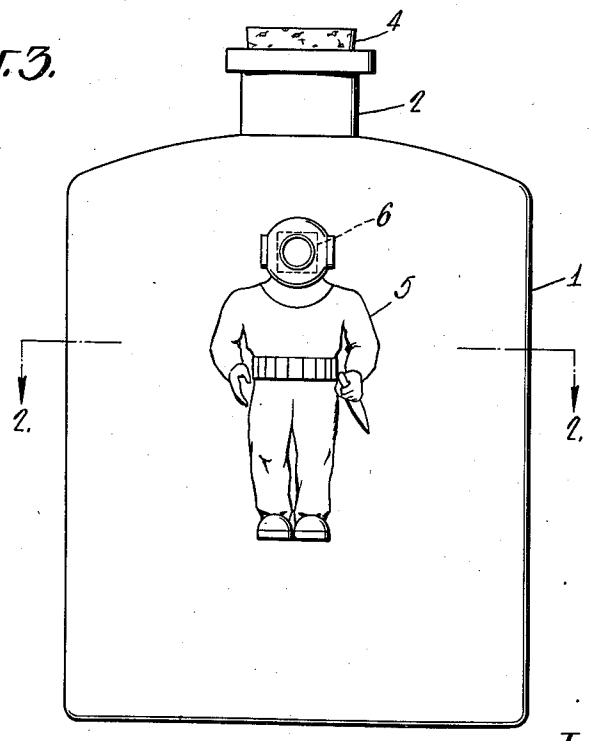


Fig. 3.



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Patented July 14, 1942 2,290,067

UNITED STATES PATENT OFFICE

2,290,067

DIVING TOY

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Application January 29, 1941, Serial No. 376,531

6 Claims. (Cl. 46—92)

This invention relates to new and useful improvements in amusement devices of the Cartesian diver type and more particularly to a novel diving member therefor.

The principal object of the present invention is to provide an amusement device of the type set forth having a novel diving member of two-dimensional form composed of waterproof sheet material characterized by its inherent resilient flexibility.

Another object of the invention is to provide for an amusement device of the present type a diving member of the character described, having a novel pressure responsive buoyant element associated therewith.

A further object of the invention is to provide for an amusement device of the present type a diving member constructed and arranged to permit of the use of members of comparatively large surface area with respect to the size of the container.

These and other objects of the invention and the various features of the construction, arrangement and use thereof are hereinafter fully set forth and described and shown in the accompanying drawing, in which:

Figure 1 is a view in plan of an amusement device employing the present invention.

Figure 2 is a view in section taken on line 2—2, Figure 3; and

Figure 3 is a front elevation view of the device disclosed in Figure 1.

Referring now more particularly to the drawing, reference numeral 1 designates, generally, a container, such as a bottle or the like, having a neck 2 at its top provided with an opening 3 therethrough to the interior of said container. As shown, the body of the container 1 in cross-section is of relatively narrow elongated configuration while the opening 3 in the neck thereof is circular in shape and of substantially smaller size than the cross-section of the interior of said container body portion. The container 1 normally is filled with water and its neck opening 3 closed with a cork or other suitable stopper 4 (not shown).

In addition to the water, the container is intended to contain an element or member 5 constructed and arranged to rise or fall through the water in said container in response to a decrease or increase, respectively, in the pressure exerted upon the water by the neck closure 4. The invention comprehends, particularly, certain novel features of construction and arrangement of the element or member 5.

In prior amusement devices of the present type the members immersed in the water within the container have generally been of three-dimensional form having a maximum cross-sectional shape and area less than the opening 3 in the neck 2 of the container in order that said members may be passed through the neck opening 3 into the body of the container. This is objectionable for not only are the members limited to quite small sizes but after the members have been inserted into the container there is nothing to keep them faced in one general direction and they, therefore, tend to rotate with the result that most of the time they do not face in the direction of or toward the person using the amusement device.

Now according to the present invention, the member 5 is two-dimensional and formed of relatively thin sheet material that is waterproof and has a density greater than water so that it will sink therein in the manner hereinafter described. The height, vertically of the sheet material member 5 is, of course, predeterminedly proportioned with respect to the height of the body of the container and, on the other hand, the maximum width and height of the sheet member 5 is made substantially greater than the maximum thickness of the interior of the container body from front to back thereof. This is done for the purpose of preventing complete rotation of the member 5 about its vertical and horizontal axes within said container 1. Thus, as shown in dot and dash lines in Figure 2, when the member 5, tends to rotate, for example, about its vertical axis, its side edges contact the front and rear walls of the container 1 and these portions, acting as stops tend to urge the member 5 in the reverse direction thus functioning to maintain the member 5 facing forwardly at all times. Apart from these considerations it will be seen that members having a comparatively large front surface size and area may be employed.

Since the maximum width of the member 5 is substantially greater than the thickness of the container 1 as aforesaid, said member 5 likewise has a width considerably greater than the diameter of the opening 3 in the container neck 2. Hence, in order to permit of the insertion of the member 5 into the container 1 the sheet material comprising the same essentially is flexible transversely so that it can be deformed or bent into an arcuate or curved cross-section shape having a radius small enough to pass through the neck opening 3, for example, as shown in Figure 1 of the drawing. Too, in addition to

being flexible, it is essential that the material comprising the member 5 have sufficient inherent resiliency to cause the member 5 automatically to resume or return to its generally flat shape after it has been bent and passed through the neck opening 3 into the body of the container 1.

The configuration of the sheet member 5 in elevation may be formed to conform to the outline of any particular person, object or article that it may be desired to represent, and a likeness of such person, object or article may be printed, painted or otherwise reproduced in one or more colors on the front face of said sheet member. The material employed for this purpose should be waterproof and, of course, the sheet material comprising the member 5 essentially provides a surface capable of receiving and retaining the ink, paint or other material thereon in the presence of water.

As sheet material for the member 5, I preferably employ Celluloid in thin sheet form for I have found that such material not only is waterproof and characterized by the desired degree of flexibility and resiliency, but also that its surface will receive and retain waterproof inks and paint thereon. Too, this material in the form used is heavier than water and, furthermore, it is comparatively inexpensive and readily obtainable on the market. There may exist other sheet materials possessing the desired properties that can be used effectively and, therefore, I do not wish to limit the present invention to the use of Celluloid alone.

To impart buoyance to the sheet member 5 in order that it may be caused to rise through the water in the container under certain conditions hereinafter described, there is secured to the rear surface of said sheet member a suitable pressure responsive element 6 which, upon an increase in pressure within said container, will be compressed thereby reducing the buoyant effect of said element 6 upon the sheet member 5 to an extent that said member will sink or fall downwardly through the water and which, when the pressure is again reduced, will expand thereby increasing the buoyant effect of the element 6 to an extent causing the member 5 to rise in the water in the container 1.

For this pressure responsive element 6 I preferably employ cellular rubber. This is a gas-expanded rubber product comprising a multitude of minute, entirely closed gas containing pockets or cells. The size of the element 6 employed is, of course, dependent upon and directly related to the weight or density of the sheet member 5 as well as the pressure at which the device is to operate. Hence the size of the element 6 that is employed will vary for different sized devices as well as for diving members of different density, and I have found that, with a cellular rubber having a density of about fourteen pounds per cubic foot, good results are obtained by employing for the element 6 a relatively small piece of said cellular rubber having a weight approximately one-third the weight of a body member 5 composed of sheet Celluloid. This ratio may be changed as required when sheet materials other than Celluloid are employed.

The pressure responsive element 6 is secured to the rear surface of the sheet member 5 by means of a suitable waterproof cement. Preferably for this purpose I employ a commercial form of rubber cement which retains its flexibility upon drying and thereby eliminates any tendency for the element 6 to become loosened as a result of its continued expansion and contraction as a result of pressure variation to which subjected.

Variation of the pressure under which the water in the container 1 is placed is effected by varying the pressure exerted downwardly upon the cork or stopper closure 4 in the neck opening 3 of said container, for example, by the thumb of the person operating the device, and in operation of said device, sufficient pressure applied downwardly upon said closure 4 will place the water in said container 1 under pressure thereby causing a compression of the pressure responsive element 6 sufficiently to cause the member 5 to fall downwardly through the water to the bottom of the container while a release of the pressure from the closure 4 will effect a corresponding reduction in the water pressure allowing the element 6 again to expand thus increasing its buoyancy and causing the member 5 to rise through the water to the top of the container 1.

From the foregoing, it will be observed that the present invention provides a novel diving member for amusement devices of the present type which is exceedingly inexpensive to manufacture and which is characterized also by its water resistant properties as well as its inherent resilient flexibility thereby permitting the use of a substantially larger diving member having a width sufficient to prevent rotation thereof within a container body while at the same time enabling said diving member to be deformed and inserted readily and easily within the narrow neck of the container with the assurance that the member will again assume its normal flat sheet-like form.

While a particular embodiment of the present invention has herein been illustrated and described, it is not intended to limit said invention to such disclosure but that changes and modifications may be made and incorporated therein within the scope of the annexed claims.

I claim:

1. An amusement device of the character described comprising a container of laterally elongated cross-section shape to be filled with a liquid and having a narrow neck opening at the top thereof, a diving member in the container comprising a body portion of thin waterproof sheet material and a gas containing pressure responsive float element secured to the rear surface thereof, said sheet material body portion of the diving member having a maximum width substantially greater than the maximum width of said elongated container cross-section thereby preventing rotation of said diving member within the container, and said sheet material body portion being characterized by its flexibility and resiliency thereby to permit it to return to substantially flat sheet-like form after being deformed and inserted through the narrow neck opening of said container, and a closure in the neck portion of said container operable to vary the pressure upon the liquid in the container to cause the diving member to move upwardly or downwardly through the liquid in accordance with the effect of such pressure variation upon the pressure responsive element of said diving member.

2. An amusement device of the character described comprising a container of laterally elongated cross-section shape to be filled with a liquid and having a narrow neck opening at the top thereof, a diving member in the container

comprising a body portion of thin waterproof sheet material and a pressure responsive float element of closed cell gas expanded soft rubber secured to the rear surface thereof, said sheet material body portion of the diving member having a maximum width substantially greater than the maximum width of said elongated container cross-section thereby preventing rotation of said diving member within the container, and said sheet material body portion being characterized by its flexibility and resiliency thereby to permit it to return to substantially flat sheet-like form after being deformed and inserted through the narrow neck opening of said container, and a closure in the neck portion of said container operable to vary the pressure upon the liquid in the container to cause the diving member to move upwardly or downwardly through the liquid in accordance with the effect of such pressure variation upon the pressure responsive element of said diving member.

3. An amusement device of the character described comprising a container to be filled with a liquid and having a neck opening at the top thereof, a diving member in the container comprising a body portion of thin waterproof sheet material and a gas containing pressure responsive float element secured to the rear surface thereof, said sheet material body portion being characterized by its flexibility and resiliency thereby to permit it to return to substantially flat sheet-like form after being deformed and inserted through the neck opening of said container, and a closure in the neck portion of said container operable to vary the pressure upon the liquid in the container to cause the diving member to move upwardly and downwardly in accordance with the effect of such pressure variation upon the pressure responsive element of said diving member.

4. An amusement device of the character described comprising a container to be filled with a liquid and having a neck opening at the top thereof, a diving member in the container comprising a body portion of thin waterproof sheet material and a pressure responsive float element of closed cell gas expanded soft rubber secured to the rear surface thereof, said sheet material body portion having a maximum width substantially greater than the maximum width of said elongated container cross-section thereby preventing rotation of said diving member within the container, and a closure in the neck portion of said container operable to vary the pressure upon the liquid in the container to cause the diving member to move upwardly or downwardly through the liquid in accordance with the effect of such pressure variation upon the pressure responsive element of said diving member.

5. A diving member for amusement devices of the character described comprising a body portion of thin waterproof sheet material, said sheet material body portion being characterized by flexibility and resiliency thereby to permit of its deformation and thereafter of its return to its original form free from damage, and a gas containing pressure responsive float element secured to a surface of said sheet body portion.

6. A diving member for amusement devices of the character described comprising a body portion of thin waterproof sheet material, said sheet material body portion being characterized by flexibility and resiliency thereby to permit of its deformation and thereafter of its return to its original form free from damage, and a pressure responsive float element of closed cell gas expanded soft rubber secured to a surface of said sheet body portion.

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