Nov. 29, 1960 W. M. DAVIS 2,961,796

TOY DEVICE

Filed Sept. 2, 1958

Fig. 1.

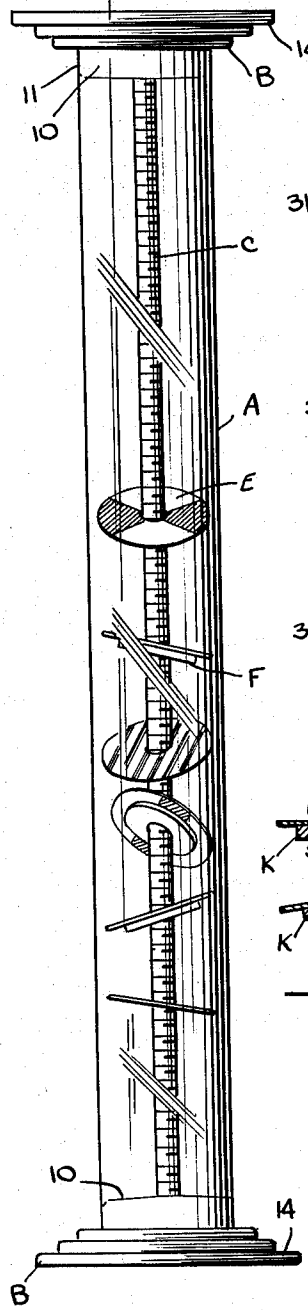


Fig. 6.

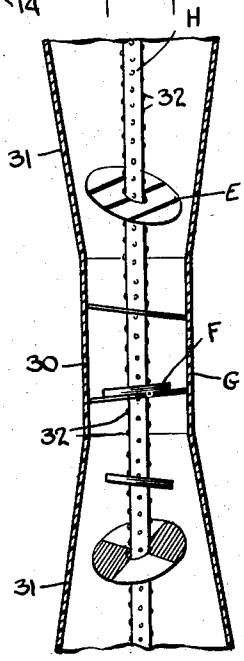


Fig. 2.

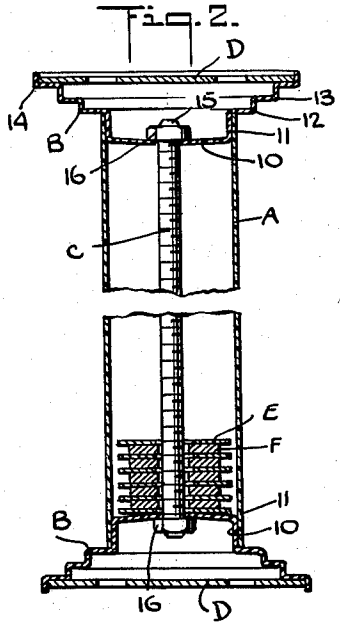


Fig. 4.

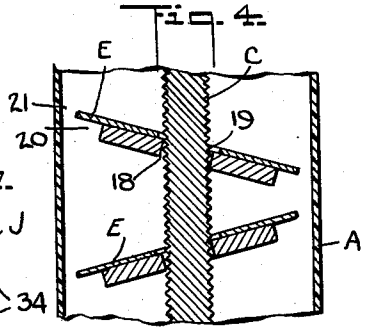
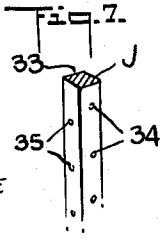


Fig. 7.



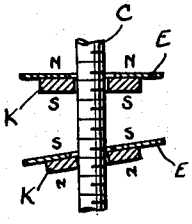


Fig. 8.

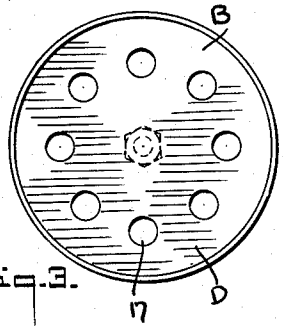
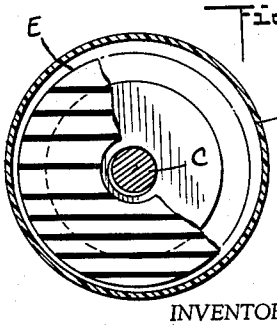


Fig. 3.

Fig. 5.



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TOY DEVICE

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9 Claims. (Cl. 46—236)

The present invention relates to a toy device and it particularly relates to a toy device in which a plurality of falling, oscillating objects create a novel and attractive effect.

It is among the objects of the present invention to provide a simple, inexpensive, light-weight durable toy having few movable parts, which will depend upon novel attractive sound and visual effects.

A further object is to provide an elongated toy device having falling elements which may be actuated by a reversal of the device and which will be of particular interest to young children.

Still further objects and advantages will appear in the more detailed description set forth below, it being understood, however, that this more detailed description is given by way of illustration and explanation only and not by way of limitation, since various changes therein may be made by those skilled in the art without departing from the scope and spirit of the present invention.

In accomplishing the above objects it has been found most satisfactory according to one embodiment of the present invention to provide an elongated cylindrical or hour-glass container member through which extends the rod serving as a guide for a plurality of annular elements desirably alternately consisting of light plastic or paper discs and relatively heavy metal discs which have been centrally holed to closely fit upon the rod. The heavy metal discs give an oscillating and turning movement and create a "clicking" or noise effect while the light colored discs will give an eye appeal.

The rod is desirably threaded through or provided with projections or protuberances at spaced intervals which will engage the openings within the discs desirably at one side of the central opening while the other side is free, causing the elements in their descent through the cylinder to oscillate back and forth and turn with the light discs, tending to drop or rest on the top of the heavy discs as the heavy discs descend with their oscillating and rotating motion through the tube and around the threaded rod.

The ends of the cylinder are desirably provided with stepped plug members which give the effect of resonant drums amplifying and intensifying the sound which arises due to the swinging step-wise action of the light and heavy discs as they drop through the cylinder or hour-glass element in an oscillating motion controlled by the thread or projections upon the central guide rod.

The metal members are desirably smaller in diameter with substantial clearance in respect to the walls of the cylinder while the disc members should very closely fit the transparent cylinder so as to give rise to a piston or dashpot effect slowing descent. If desired, the metal discs may be provided with adjacent north and south poles so that they will tend to repel each other but with the weight of the discs being such as to overcome the magnetic repulsion by slowing down the gravity descent.

Although it is preferred to have a cylinder or hour-glass element of cylindrical cross-section and thin transparent plastic it may also be made of glass or non-transparent materials or even translucent materials and may be of other cross-sections than circular, such as square or triangular, or even hexagonal or octagonal.

It is also desirable that the central rod which holds the plugs in position in the ends of the elongated cylinder or hour-glass be a continuous threaded metal rod to enhance the sound effects but it can also consist of a plastic or wood stick which instead of being threaded may have spaced projections but this is not desirable since a metal rod with projections or threads will give the maximum sound effect.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

Figure 1 is a side elevational view of a preferred toy construction according to the present invention showing the annular discs falling through the cylinder after it has been inverted.

Fig. 2 is a transverse longitudinal sectional view similar to Fig. 1, broken away to shorten the length of the device, showing the objects all piled up by gravity at one end of the cylinder after they have descended through the cylinder and just before the cylinder is to be inverted to cause the effect of Fig. 1.

Fig. 3 is an end elevational view of either end of the device of Figs. 1 and 2 showing the sound box element.

Fig. 4 is a fragmentary longitudinal sectional view of the device of Fig. 1 showing the discs in their rocking descent of the central rod.

Fig. 5 is a transverse sectional view showing the eccentric position of the annular disc elements in respect to the central guide shaft and in respect to the transparent outer cylinder.

Fig. 6 is a fragmentary longitudinal sectional view similar to Figs. 2 and 4 showing the discs falling upon the central guide shaft which, however, is provided with spaced projections instead of threads and with the cylinder having an hour-glass shape.

Fig. 7 is a fragmentary perspective view of a portion of an alternative form of central guide rod which is of square cross-section with spaced projections which may be substituted for the threaded central guide rod of Figs. 1, 2, 4 and 5 or for the circular cross-section guide rod of Fig. 6.

Fig. 8 is a transverse sectional view of an alternative form of the invention in which the annular disc elements are provided with opposite adjacent repelling pole faces to slow the descent of the annular objects through the cylinder or hour-glass elements.

Referring to Figs. 1 to 5 which show the first embodiment of the present invention and the preferred embodiment, there is a main elongated transparent plastic cylinder A which is plugged at its end by the stepped sound boxes B which are held together by the threaded central guide rod C.

The ends of the drums or stepped resonant elements B are provided with holed paper or cardboard discs D to control the quality of the sound and give a more solid effect.

Within the cylinder and on the rod C there are positioned a series of thin plastic or paper discs E almost contacting the interior walls of the cylinder A associating

with smaller diameter metal and heavier discs F, with the heavier discs oscillating and turning during their descent and the thin plastic or paper discs dropping onto the heavier discs during the descent.

Referring particularly to Fig. 2 the end resonant box members B are provided with the plug portions **10** which fit in the ends **11** of the transparent plastic cylinder A. The boxes are stepped as indicated at **12**, **13** and **14** and the end step **14** forms a recess in which the plug D is tightly fitted.

The central portion of the plug portion **10** receives the end **15** of the rod C (see Fig. 2).

The rod will be held in position by the nuts **16** which will draw up the plugs **10** into the ends of the cylinder and hold the entire construction firmly together.

The end discs D which control the resonant effect have a series of peripherally arranged openings **17** which enhance the sound box effect.

As shown in Fig. 5 the plastic disc E will normally be relatively light and thin and will closely fit the interior of the cylinder A and be eccentrically positioned both in respect to the rod C and the walls of the cylinder A.

Each heavy disc F will oscillate and rotate as it falls downwardly through the cylinder A, while the light colored discs E will also assume oscillating positions and tend to drop onto the heavy discs as the heavy discs descend down through the cylinder A.

The meal discs F, as shown in Fig. 4, will more closely fit the rod C as indicated at **18** as contrasted to the plastic disc clearance at **19** but at the same time the metal discs F will have a greater clearance in respect to the cylinder A as indicated at **20** as compared to the clearance **21** of the discs E.

Normally the relatively light discs E will follow the heavy discs F as they descend. As the metal elements F oscillate and rotate downwardly they will cause a very definite metallic sound to be picked up by the end sound boxes B, calling visual attention to the movement of the objects E and F down through the cylinder A due to the gravity effect.

The metal discs as well as the plastic discs may be given different colors or different segments or sectors thereof may be given contrasting colors to enhance the visual effect.

The effect as visually indicated in Fig. 1 very attractively calls attention of both the eye and the ear due to the noise that results as these elements descent in step-wise or fluttering fashion through the cylinder.

In the alternative embodiment of Fig. 6 the cylinder G has an hour-glass shape with a narrow throat **30** and conical end portions **31**. The central rod H is not threaded as is the rod C but it has a series of spaced projections **32** which result in the step-wise rocking action of the elements of E and F in their descent.

The elements E and F may be of the same construction as shown and described in Figs. 1 to 5.

In the embodiment of Fig. 7 the central guide rod J has a square cross-section as indicated at **33** with the spaced alternating projections **34** and **35** on opposite faces thereof to cause the discs E and F to partake of a step wise descent.

In the embodiment of Fig. 8 the central guide rod C may be threaded and of the same construction as in Figs. 1 to 5 as may also the thin plastic discs E.

However, the metal elements K are preferably arranged and made of aluminum nickel cobalt alloys or other permanent magnetic material so that they may have opposing similar poles with the south poles being adjacent to each other and the north poles being adjacent to each other so as to slow the descent as they fall downwardly through the cylinder A or through the cylinder G. However, the weight of the metal disc K will have the same effect as the weight of the disc F shown in Fig. 2 with all of the elements finally resting due to the effect of gravity at the bottom of the cylinder.

It will be noted that the metal discs are always covered on each side by a plastic disc E which serves as the last element to cover the discs when piled together or the first element to fall when the cylinder is reversed from the position of Fig. 2 to the position of Fig. 1.

In other words, the plastic discs will always be the first to fall regardless of the reversal of the toy device.

It is thus apparent that the applicant has provided a very simple yet attractive toy device which is durable, inexpensive and achieves a most attractive visual effect as well as an aural effect.

It will be noted that preferably the cylinder A and the sound box B are made of thin lightweight plastic while the members D are made of thin cardboard so that the sole weight of the entire object resides in the rod C and the heavy metal discs F with the weight of the plastic discs E being negligible. This will concentrate the weight centrally of the cylinder A between the ends of the cylinder and between the sound boxes B.

The fluttering motion of the brightly colored light discs in their descent through the cylinder will give an eye appeal and a variegated color effect with different color patterns.

These light discs will tend to conform to the oscillating or rock-wise movement of the heavy metal discs in dropping through the cylinder.

While there has been herein described a preferred form of the invention, it should be understood that the same may be altered in details and in relative arrangement of parts within the scope of the appended claims.

Having now particularly described and ascertained the nature of the invention, and in what manner the same is to be performed:

What is claimed is:

1. A toy device comprising an elongated cylindrical element having a central longitudinal guide rod and end plug members attached to ends of said cylinder and a plurality of annular disc members fitted upon said rod to fall in rotating stepwise fashion upon each reversal of said cylindrical element, said rod causing said disc members to partake of both rotating and oscillating movement in falling through the cylinder to give a fluttering effect, said disk members being circular and consisting alternately of relatively wide diameter thin, light weight plates having central openings sufficiently wide as not to contact the guide rod in falling and the intervening disk members being of relatively heavy, thick metal plate and of smaller diameter with small central openings so as to engage said central rod upon falling with the result that the thin, light plates will be retarded by their piston effect and by contact with the heavy plates and the heavy plates will be retarded in falling by contact with the guide rod.

2. A toy device comprising an elongated cylindrical element having a central longitudinal guide rod and end plug members attached to ends of said cylinder and a plurality of annular disc members fitted upon said rod to fall in rotating stepwise fashion upon each reversal of said cylindrical element, said rod causing said disc elements to partake of both rotating and oscillating movement in falling through the cylinder to give a fluttering effect, said cylindrical element consisting of a transparent plastic cylinder and said plug members consisting of thin molded stepped sound box elements having damper closures of cardboard, said disk members being circular and consisting alternately of relatively wide diameter thin, light weight plates having central openings sufficiently wide as not to contact the guide rod in falling and the intervening disk member being of relatively heavy, thick metal plate and of smaller diameter with small central openings so as to engage said central rod upon falling with the result that the thin, light plates will be retarded by their piston effect and by contact with the heavy plates and the heavy plates will be retarded in falling by contact with the guide rod.

3. A toy device comprising an elongated cylindrical element having a central longitudinal guide rod and end plug members attached to ends of said cylinder and a plurality of annular disc members fitted upon said rod to fall in rotating stepwise fashion upon each reversal of said cylindrical element, said rod causing said disc members to partake of both rotating and oscillating movement in falling through the cylinder to give a fluttering effect, said rod consisting of a plurality of projections spaced along the length thereof and said annular disc members consisting of alternating light, thin discs and heavy, thick discs with the thin discs more closely fitting the periphery of the interior of the cylinder than the thick discs.

4. A toy device comprising an elongated cylindrical element having a central longitudinal guide rod and end plug members attached to ends of said cylinder and a plurality of annular disc members fitted upon said rod to fall in rotating stepwise fashion upon each reversal of said cylindrical element, said rod causing said disc members to partake of both rotating and oscillating movement in falling through the cylinder to give a fluttering effect, said guide rod being threaded and said plug members being stepped thin plastic sound boxes and clamped to the ends of said cylinder by said guide rod, said disk members being circular and consisting alternately of relatively wide diameter thin, light weight plates having central openings sufficiently wide as not to contact the guide rod in falling and the intervening disk members being of relatively heavy, thick metal plate and of smaller diameter with small central openings so as to engage said central rod upon falling with the result that the thin, light plates will be retarded by their piston effect and by contact with the heavy plates and the heavy plates will be retarded in falling by contact with the guide rod.

5. A reversible falling disk transparent cylinder toy device having alternating light and heavy disks to fall through the cylinder on each reversal comprising an elongated cylindrical container, a central longitudinally and axially extending guide rod, end closure elements connected to the ends of the guide rod, and a plurality of falling circular disks mounted on said guide rod, each having a central opening to fit on the guide rod and consisting alternately of thin, light weight disks having a large central opening which will fit upon but not be retarded in falling by the guide rod and a large outside diameter which will be so close to the container wall as to have a piston effect and to be slowed in falling by the necessity of air flowing around the disks and the in-between disks being relatively thick and heavy and having much smaller outside diameters so as to have wide spacing in respect to the cylinder with a smaller central opening to engage the guide rod in their descent and result in a wobbling downward movement.

6. The device of claim 5, said rod having a continuous screw thread to engage the central opening of the heavy disks and retard their descent.

7. The device of claim 5, said enclosure elements including inwardly inserted cups projecting inside of the ends of the container said cups having outwardly extending stepped flanges and holed closure plates closing said cups to form end resonators.

8. The device of claim 5, said light disks having colored areas and said heavy disks being of metal and being magnetized with opposite south pole and north pole faces.

9. The device of claim 5, the central portion of said device having parallel cylindrical walls and the end portions of said container diverging from the central portion to the end closures so that the light disks will fall more freely through the end portions of the container than through the central portion of the container.

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