Oct. 26, 1943. O. R. DAILEY 2,332,507

TOP

Filed Nov. 4, 1940

Fig. 1

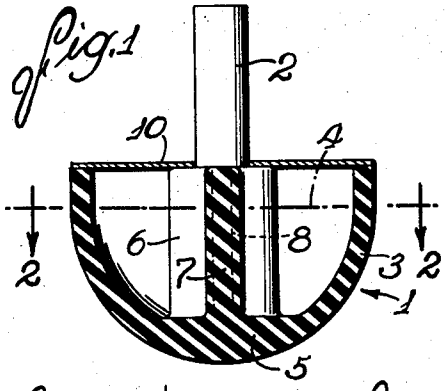


Fig. 2

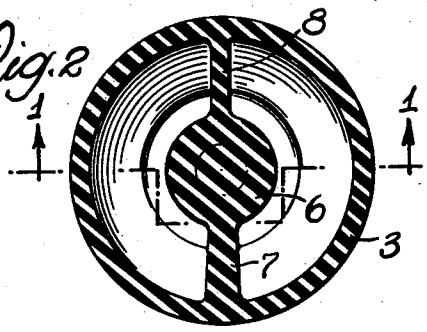


Fig. 3

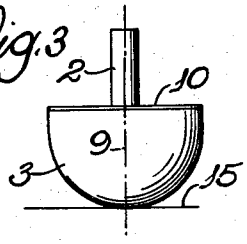


Fig. 4

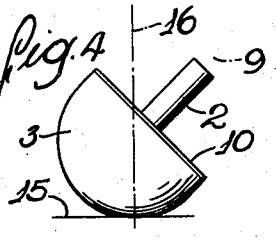


Fig. 5

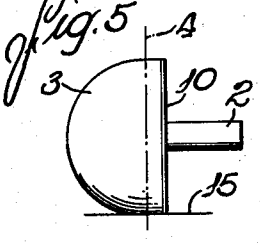


Fig. 6

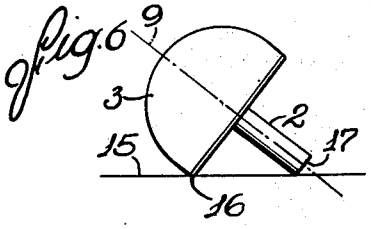


Fig. 7

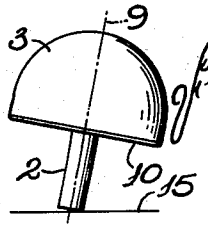


Fig. 8

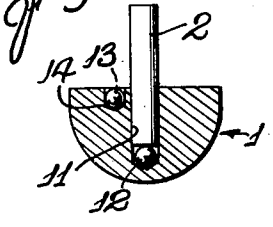


Fig. 9

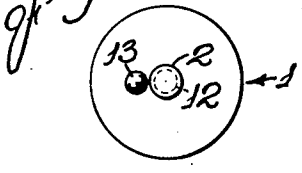


Fig. 10

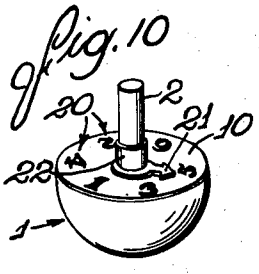
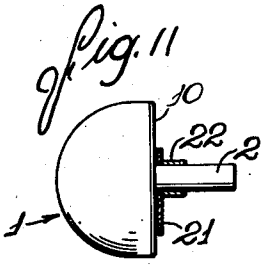


Fig. 11



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TOP

Owen R. Dailey, Rockford, Ill.

Application November 4, 1940, Serial No. 364,169

4 Claims. (Cl. 273—147)

This invention relates to tops of the kind adapted, when spun at the proper speed, to become inverted automatically and to continue spinning in inverted position.

The general object is to provide such a top which is simple and inexpensive to construct, which does not require accurate construction or balance to operate in the intended manner, and which may be made generally hemispherical in shape.

Another object is to arrange in a novel manner the weighted portions by which automatic inversion is obtained.

A further object is to provide a construction which may be cast.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawing, in which

Figure 1 is a vertical sectional view of a top embodying the present invention, the section being taken along the line 1—1 of Fig. 2.

Fig. 2 is a plan section taken along the line 2—2 of Fig. 1.

Figs. 3 to 7, inclusive, are elevational views illustrating different positions of the top in operation.

Fig. 8 is a vertical cross sectional view of a modified form of the top.

Fig. 9 is a plan view of the top shown in Fig. 8.

Fig. 10 is a perspective view of a modified form of the top.

Fig. 11 is an elevational view partially in section.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawing and will herein describe in detail the preferred embodiment. It is to be understood, however, that I do not intend to limit the invention by such disclosure but aim to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Generally stated, the improved top comprises a stem upstanding from a substantially hemispherical body which is weighted laterally of its axis and also along the axis adjacent its pole so as to produce the proper combination of centrifugal and gyroscopic forces when spun in the normal way.

In the preferred form shown in Figs. 1 and 2, the top body and stem 1 and 2 are formed as one integral piece as by plastic molding. The body has a generally hemispherical external contour and is made hollow with a wall 3 of substantially uniform thickness projecting upwardly above the diametrical plane 4 of the hemisphere. Adjacent the pole of the hemisphere, the wall is thickened as indicated at 5 to provide one of the control weights for producing the inverting action.

Upstanding from the upper flat surface of the thickened portion 5 is a central cylindrical post 6 which is connected to the wall 3 by two coplanar webs 7 and 8 which complete the rigid body structure. Provision is made for shifting the center of gravity of the hemisphere laterally of the axis 9. This is accomplished herein by making the web 7 thicker than the web 8 by an amount corresponding to the unbalanced weight desired.

The stem 2 upstands from the post 6 along the axis 9. Its length in relation to the height and curvature of the body is not critical, but is of the approximate proportions shown and correlated with the control weights so that the top as a whole may in effect roll from the tipped over position (Fig. 6) to the fully inverted position (Fig. 7). Actually, the stem length and weights are correlated in a manner such that the top, when not spinning and tipped over, substantially balances in the position shown in Fig. 6.

If desired, a cover 10 may be provided on the hollow body. This may comprise a disk of paper, Celluloid or the like pressed down over the stem against the ends of the wall 3 and the post 6.

When the top is made of wood, the body 1 preferably comprises a solid hemisphere and formed with a bore 11 into which the stem, separately formed, is held with a press fit. To provide the axial control weight corresponding to the portion 5 of Fig. 1, a weight 12 such as a small lead shot is disposed in the bore 11 below the stem, the bore being extended to the proper depth in order to accommodate the weight. The eccentric weight is provided by a separate shot 13 pressed into a shallow recess 14 drilled in the flat upper surface of the body.

The action of the top is illustrated in Figs. 3 to 7. To spin it, the stem 2 is held between the thumb and forefingers in the usual way and twirled rapidly as the top is released onto a smooth supporting surface 15 while turning about its axis 9 then vertically disposed as shown in Fig. 3. Due to the eccentricity of the side weight and its disposition above the point of supporting surface, a centrifugal force is created which acts at an effective moment arm such as to overcome the gyroscopic effect of the axial weight 5 and to

cause tilting of the top toward the position shown in Fig. 4. The axis of rotation remains upright as indicated at 16 while the top axis 9 tilts gradually depending on the speed of rotation at the time of release and the character of the supporting surface. As this tilting continues, the side weight becomes less effective while the bottom weight becomes eccentric of the rotational axis and its moment arm becomes more effective. In the mid-position shown in Fig. 5, rotation of the top about its axis 9 has ceased and the top as a whole is rotating about the upright axis which then lies in the diametrical plane 4 of the top body. At this time, the bottom weight 5 is most effective in creating a centrifugal force directed so as to cause further tilting. As this action continues slowly, the top passes through the position shown in Fig. 6, whereupon the point of support is transferred from the peripheral edge 16 onto the edge of the stem end 17. If the spinning has been initiated at a sufficiently high speed, the tilting forces developed will be of a magnitude such as to tip the top on end as shown in Fig. 7 as an incident to which the top axis 9 again approaches and substantially coincides with the rotational axis. As a result, the top continues to spin at a slower speed in inverted position. In this position and at the slower speed, the unbalanced side weight does not create sufficient force to overcome the gyroscopic force of the axial weight. Accordingly, the top spins upside down until its energy is dissipated whereupon it tips back into the position shown in Fig. 6.

If desired, the top may be utilized advantageously in games of chance. To this end, legends 20 may be printed in an annular series on the upper surface of the disk 10. These coact with a pointer 21 apertured at its center and received on the stem 2 where it is held by a pressed on washer 22. As an incident to spinning the top, the pointer will turn to some indeterminate degree and will assume a new angular position each time the top comes to rest.

I claim as my invention:

1. A top of the character described comprising a hollow substantially hemisphere, a post rigid with the bottom of said hemisphere and upstanding therefrom to define a stem, and webs rigidly joining said post and the wall of said hemisphere, said webs having different masses whereby the center of gravity is disposed laterally of the axis of said hemisphere.

2. A top comprising a hemispherical body having a generally flat upper surface, a stem projecting from said surface along the axis of said body, and means within said hemispherical body providing an unbalanced weight eccentrically of the body axis and an eccentrically balanced weight concentrated along said axis adjacent the surface of the body.

3. A top comprising a solid inverted hemispherical body with a bore extending into the flattened side of the body to a point adjacent the bottom of the body, a weight in the lower end of said bore, a stem pressed into said bore and upstanding from said flattened side, and a weight sunk in said flattened side eccentrically of the stem, said weights being positioned and proportional to cause automatic inversion of the top when the latter is spun at a predetermined speed.

4. A top of the character described comprising, a hemispherical body having a substantially flat upper surface terminating in a circumferential edge disposed slightly above a diametrical plane of the hemisphere normal to the polar axis, and a stem projecting above said body along the polar axis, said body being symmetrically weighted adjacent its pole and eccentrically weighted adjacent said plane.

OWEN R. DAILEY.