Jan. 10, 1950 L. SANDERS ET AL 2,493,834

GYROSCOPE TOP

Filed May 9, 1946

Fig. 1

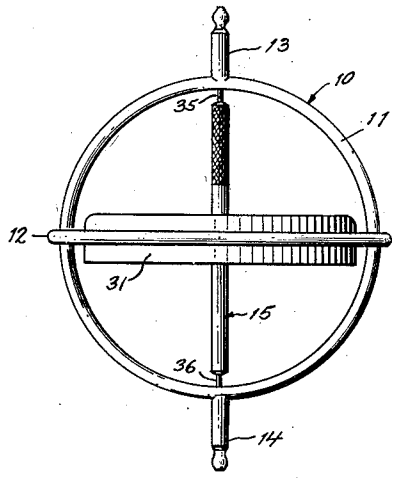


Fig. 2

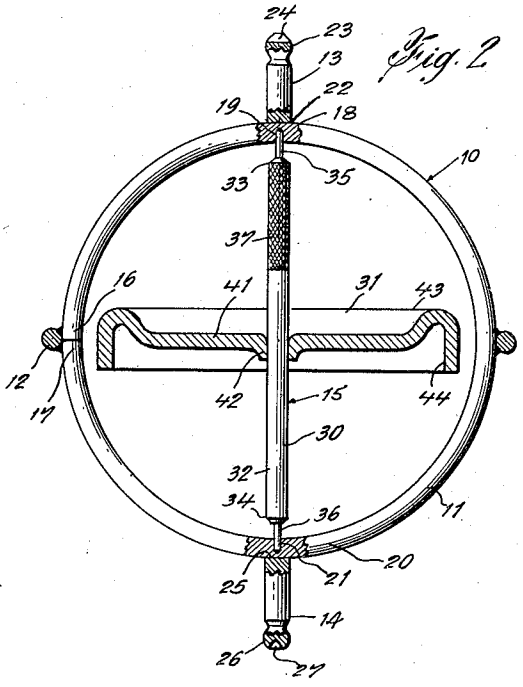


Fig. 3

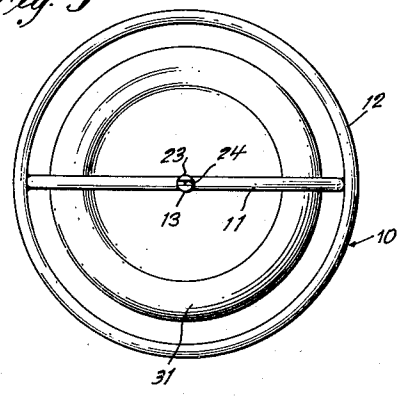


Fig. 4

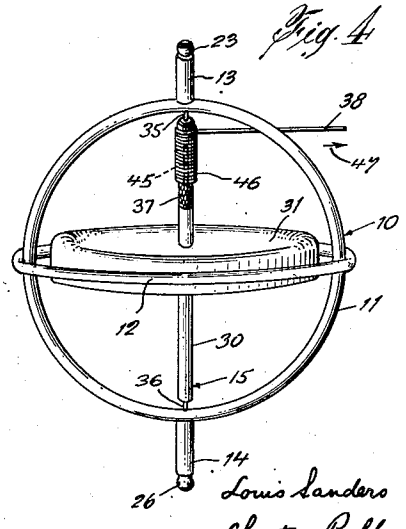
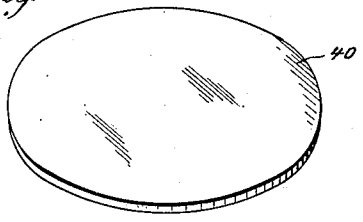


Fig. 5



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GYROSCOPE TOP

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3 Claims. (Cl. 46—50)

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This invention relates generally to the field of toys and more particularly to an improved gyroscope spinning top.

While tops of this general character are well known they have been of faulty construction when manufactured to sell at a low price or they have been relatively expensive where the parts have been properly balanced.

It is among the objects of the present invention to produce a gyroscope spinning toy which may be manufactured in large quantity at low cost and yet is substantially constructed and properly balanced so as to give the performance of heretofore more expensively manufactured tops.

In toy spinning tops of the character described gyroscopic action is obtained by spinning a fly-wheel at a relatively high speed. The fly-wheel has been caused to rotate by anchoring the end of a string in an orifice in the main shaft. This construction is open to the objection of requiring greater skill in the starting of the winding of the string upon the main shaft and of having a retarding effect upon the return of the main shaft and fly-wheel at the instant that the string becomes disengaged from the orifice in the main shaft. It is therefore another object in the present invention to provide an improved means of engaging and winding a string upon the main shaft of the top.

A feature of the present invention lies in the fact that after the string has been properly engaged upon the main shaft the top may be manually grasped between the upper and lower tips thereof and rotation of the fly-wheel will result in a winding of the string.

Heretofore the fly-wheels of tops of the character described have been principally fabricated by casting with resultant imbalance of the fly-wheel owing to uneven casting.

Where the casting operation has been carefully performed to produce balance or where the fly-wheels have been fully machined a relatively expensive top has been produced. In accordance with the present invention the fly-wheel is produced by stamping, that is to say, blanking and forming the fly-wheel from sheet-metal which has been previously rolled so as to have relatively uniform thickness and density.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings in which similar reference characters designate corresponding parts throughout the several views:

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Figure 1 is an elevational view of a preferred embodiment of the invention.

Figure 2 is an enlarged elevational view corresponding generally to Figure 1, partially in central vertical section.

Figure 3 is a top plan view of Figure 1.

Figure 4 is a front view in perspective showing the main shaft as partially wound with the driving string.

Figure 5 is a view in perspective of the blank from which the fly-wheel is formed.

In accordance with the invention the gyroscope top generally indicated by reference character 10 comprises broadly a vertical frame element 11, a horizontal frame element 12, an upper tip 13, a lower tip 14, and a rotor 15.

The vertical frame element 11 is preferably circular and may be formed by bending a rod-shaped blank to the shape shown and joining the ends 16 and 17 in any suitable manner as by soldering or welding. At the uppermost portion 18 the frame element is provided with an upper downwardly opening socket 19 and at the lowermost portion 20 frame element 11 is provided with a lower upwardly opening socket 21.

The upper tip 13 has the lowermost surface 22 thereof curved to conform to the upper surface of the vertical frame element 11 and is secured thereto in any suitable manner as by soldering or welding coaxially with the longitudinal axis of the rotor 15. The terminal 23 of the tip 13 is provided with a groove 24 which is parallel to the plane of the frame 11.

The lower tip 14 has the uppermost surface 25 thereof curved to comform to the lower surface of the lowermost portion 20 of the vertical frame element 11 and is secured thereto in any suitable manner as by soldering or welding so that said tip 14 is coaxially positioned with respect to the longitudinal axis of the rotor 15. The terminal 26 has an upwardly extending cup shaped depression 27.

The horizontal frame element 12 is preferably in circular form and the internal effective diameter thereof is preferably substantially equal to or slightly greater than the effective external diameter of the frame element 11. The horizontal frame element is preferably secured to the vertical frame element at opposed points which are substantially equi-distant from the sockets 19 and 21.

The rotor 15 includes a main shaft 30 upon which is secured the fly-wheel 31. The shaft 30

is preferably in the form of an elongated solid cylinder having the exterior cylindrical surface **32**. The upper and lower terminals **33** and **34** of the main shaft **30** are provided with axially extending pintles or pivots **35** and **36** which are rotatably mounted within sockets **19** and **21** which act as bearings therefor. The upper portion of the main shaft has the surface **32** thereof roughened or knurled to provide means **37** for frictionally engaging the winding string **38**.

The fly-wheel **31** is formed up from the blank **40** so that it has a central planar portion **41**, an integral collar **42**, a circularly upwardly extending hollow bead **43** and a downwardly extending flange **44** which is spaced and parallel with respect to the surface **32** of the shaft **30**. The collar **42** preferably has an effective internal diameter which is subustantially equal to or slightly less than the effective external diameter of the main shaft **30** to that said collar may be a force fit upon said shaft. To further secure the fly-wheel upon the main shaft, the fly-wheel may be welded, soldered, or pinned in place upon said shaft. By forming the fly-wheel from the blank **40** which is of uniform thickness, the uniformity of the fly-wheel, that is to say its static and dynamic balance is maintained within satisfactory tolerances. The formation of the bead **43** and the flange **44** places a substantial proportion of the total weight of the fly-wheel at its periphery thereby increasing the "fly-wheel" effect thereof. The greatest external diameter of the fly-wheel is substantially less than the internal diameter of the frame element **11** so that the fly-wheel may be rapidly rotated without interference by said frame.

The operation of the top is a simple and convenient matter. The inner terminal of the string **38** is laid upon the means **37** and a few windings of the string or conversely a few revolutions of the shaft **32** will produce the winding **46**. The desired number of windings are placed thereupon. The frame elements **11** or **12** are preferably manually grasped and the string **38** is pulled away rapidly in the direction of the arrow **47**. This stores kinetic energy in the shaft **30** and the fly-wheel **31** whereupon the gyroscope top **10** may be utilized in several well known manners. The top may be placed upon a point not shown by inserting said point into the depression **27**. The top may, on the other hand, be so placed as to ride a string or edge (not shown) by placing said string or edge in the groove **24**.

Owing to the fact that the end **45** of the string **38** is not engaged within a hole as in prior art devices, at the end of the unwinding operation during which the fly-wheel is gaining momentum the string is quickly released by the shaft **30**. The means **37** being placed close to the fly-wheel **31** and within the frame element **11** applies the rotative force efficiently and conveniently and enables the user to grasp any of the exterior portions of the top without interfering with the unwinding of the string or the rotation of the fly-wheel and shaft.

We wish it to be understood that we do not desire to be limited to the exact details of construction shown and described for obvious modifications will occur to a person skilled in the art.

We claim:

1. A gyroscopic top for use with a winding cord comprising: a stationary frame; a rotor including a fly-wheel and a shaft; means for rotatably mounting said rotor upon said frame; said shaft having means thereon for frictionally engaging said winding said last mentioned means consisting of knurling on said shaft cord; said fly-wheel being formed from a planar blank of sheet material.

2. Gyroscopic top construction comprising: a frame element; a rotor trunnioned in said frame element; said rotor including a shaft and a fly-wheel secured thereto, said fly-wheel being composed of sheet material and having an integral peripheral flange which is spaced and parallel with respect to the outer surfaces of said shaft.

3. Gyroscopic top construction comprising: a frame element; a rotor trunnioned in said frame element; said rotor including a shaft and a fly-wheel secured thereto, said fly-wheel being composed of sheet material and having a central planar portion, a circular upwardly extending hollow bead, and a downwardly extending flange which is spaced and parallel with respect to the outer surface of said shaft.

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REFERENCES CITED

The following references are of record in the file of this patent:

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