J. C. FORSTER.

FLY WHEEL.

APPLICATION FILED JULY 25, 1917.

1,265,899. Patented May 14, 1918.

FIG. 1.

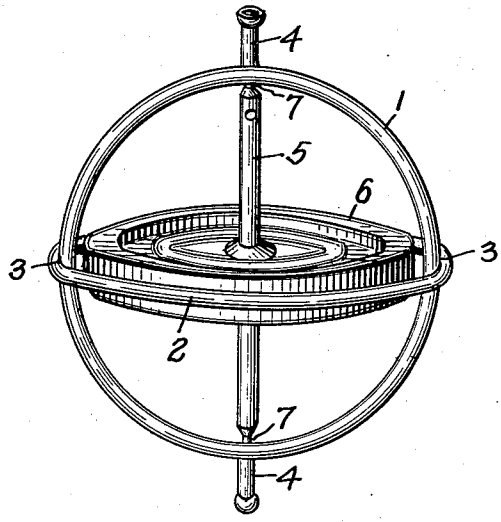


FIG. 2.

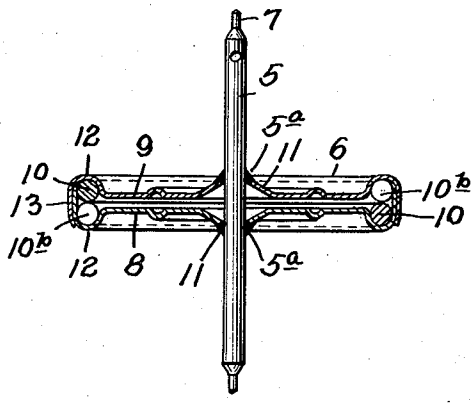


FIG. 3.

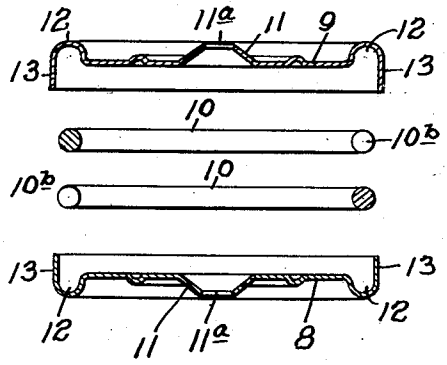


FIG. 5.

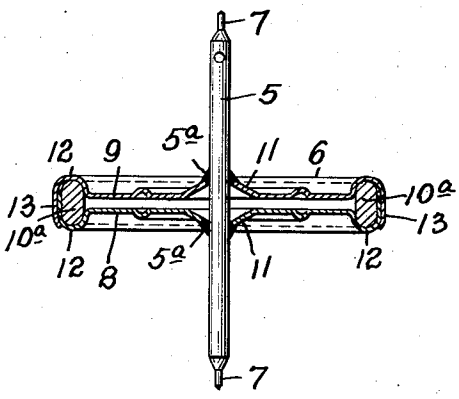
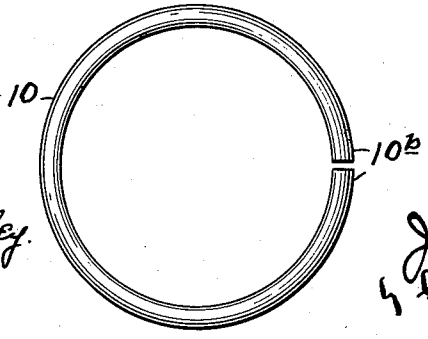


FIG. 4.



WITNESSES

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FLY-WHEEL.

1,265,899. Specification of Letters Patent. Patented May 14, 1918.

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To all whom it may concern:

Be it known that I, JOHN C. FORSTER, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Fly-Wheels, of which the following is a specification.

This invention relates to certain improvements in and relating to gyroscopes and more particularly to what are known as gyroscope tops and the like; and the objects and nature of the invention will be readily understood by those skilled in the drawings illustrating what I now believe to be the preferred mechanical expression of the invention from among other forms and arrangements within the spirit and scope thereof.

Heretofore difficulty has been experienced and time and expense has been involved in truing up the rotors of gyroscopes and the like in order to produce an approximately balanced rotary body.

It is an object of my invention to economically produce an approximately balanced rotor or rotary body for gyroscope tops and other purposes and to avoid the expensive step of separately truing up each wheel or other rotary body after casting or otherwise forming thereof, which has heretofore been necessary.

A further object of the invention is to provide a simple effective and comparatively inexpensive balanced rotor of an improved construction.

The invention consists in certain novel features in construction and in combinations and arrangements as more fully and particularly set forth hereinafter.

Referring to the accompanying drawings:

Figure 1, is a perspective of a gyroscope top embodying the rotor of my invention.

Fig. 2, is a detail view of the rotor and its spindle, the wheel of the rotor being shown in section.

Fig. 3, is a detail view showing the parts of the rotor prior to assembling.

Fig. 4, is a top plan of an annular weight of the rotor of Fig. 3.

Fig. 5, is a detail view of a modified form of rotor.

In Fig. 1, of the drawings, I show the weighted rotary wheel or rotor of my invention applied to a well known form of gyroscope toy or top, in which the frame of the toy is formed by two stiff metal rings 1, 2, arranged one within the other at right angles to each other and rigidly secured together at their crossing points 3. This rigid frame 1, 2, 3, is provided with the ordinary rigid alined diametrically opposite projecting arms or feet 4, and these arms are alined with the axis of rotation of the rotor. The rotor comprises a spindle 5, at its ends 7 having step bearings in the frame and a wheel 6 rigid with the spindle and located midway between said ends, the spindle being centrally located with respect to the periphery of the wheel, the spindle constituting the axis of the rotor. Heretofore, the wheels have been generally composed of heavy metal cast on the spindles. After casting, it has been necessary at the expenditure of much time and labor, to true up the wheels by suitable instrumentalities. This method has been more or less costly and unsatisfactory. I avoid these difficulties and items of expense by so forming the wheel or rotor that it is in effect automatically balanced in the process of manufacturing or by the act of assembling and locking the parts thereof together. To this end, the wheel or rotor is composed of a pair of round disks 8, 9, and an intervening annular weight or weights 10. Each disk is preferably struck up from sheet metal with a central boss 11, having a central perforation 11^a, and an annular groove 12 open at the inner side of the disks and located at the outer edge portion thereof, with the outer edge of the disk (forming the outer wall of the groove) forming a wide approximately cylindrical flange 12, constituting the rim of the disk concentric with the center perforation 11^a. The internal diameter of the rim or flange 13 of the disk 9, is approximately equal to the external diameter of the rim of disk 8, so that the two disks can be forced together (in forming the complete wheel or rotor) with their rims overlapping, the rim of disk 8 within the rim of disk 9, to provide a hollow annular chamber within the outer or rim portion of the wheel.

The necessary weight to enable the wheel or rotor to perform the functions of a gyroscope is provided for by one or more metal rings 10. In the construction of Figs. 2 and 3, I show the rotor weighted by two similar rings 10, each ring being composed of a length of cylindrical wire bent into circular form with its extremities 10^b brought together. In Fig. 5 I show the weight composed of one integral ring 10^a in cross sec-

tion conforming to the cross sectional formation of the hollow rim of the wheel or rotor.

In assembling the parts to form the wheel, one sheet metal disk is placed in a suitable die and the weight rings 10, are placed in the groove 12, one on the other preferably so that the ends 10^b, of the rings will break joints. The other metal disk is then slipped down on the first mentioned disk, and a suitable die is applied thereto to force the two disks tightly together with the weight rings tightly compressed therebetween and to turn the two flanges 13 inwardly as shown in Figs. 2 and 5, and thereby tightly lock the disks together against separation and to form the completed wheel.

The spindle 5, is then inserted through the eyes 11^a, in the outwardly pressed central bosses 11, forming the hub of the wheel, and secured by solder applied at the joints 5^a.

The weight rings 10, or 10^a, are balanced before being applied to the wheels, and hence the rotor when completed is balanced. In fact, the parts of the rotor are so formed that an approximately balanced rotor is automatically produced by the act of assembling the parts and locking them together.

It is evident that various changes, modifications and variations might be resorted to without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact disclosures hereof.

What I claim is:—

1. An approximately balanced rotor comprising a pair of metal disks secured together in overlapping relation and an intervening annular weight.

2. An approximately balanced rotor comprising a pair of sheet metal disks overlapping at their outer edges to form a wheel having a hollow rim and an annular weight in said rim.

3. An approximately balanced rotor having a central spindle and composed of a pair of disks the outer edges of which overlap and having alined central eyes receiving said spindle, and an annular weight clamped between said disks adjacent the overlapping portions thereof.

4. A rotor of the type substantially as described composed of a pair of opposing disks having annular edge flanges meeting to form a hollow rim, and an annular weight occupying said rim and immovably held between the disks.

5. A rotor comprising a pair of flanged grooved disks having central perforated bosses, an annular weight between the rim portions of said disks, and a central spindle extending through the perforations of said bosses and soldered to the bosses, said disks having their flanges overlapping and locked together.

6. A rotor having a central spindle and a wheel composed of a pair of complementary disks overlapping at the wheel periphery, and an annular weight held in place between said disks immediately adjacent the wheel periphery.

7. A rotor element made up of two disks stamped from sheet metal and secured together so that the peripheries thereof overlap to form a hollow rim, and a weight within said rim.

In testimony whereof I affix my signature.

JOHN C. FORSTER.