

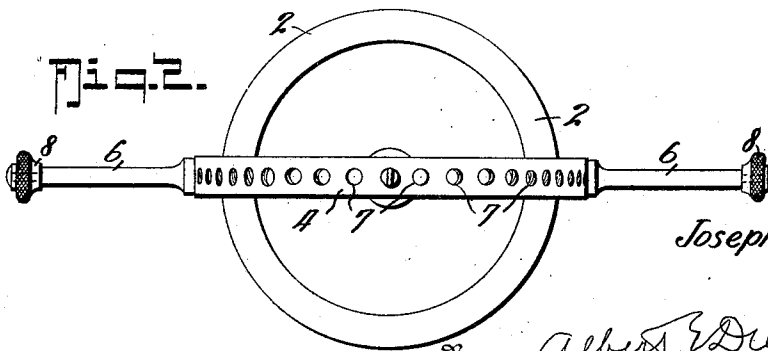
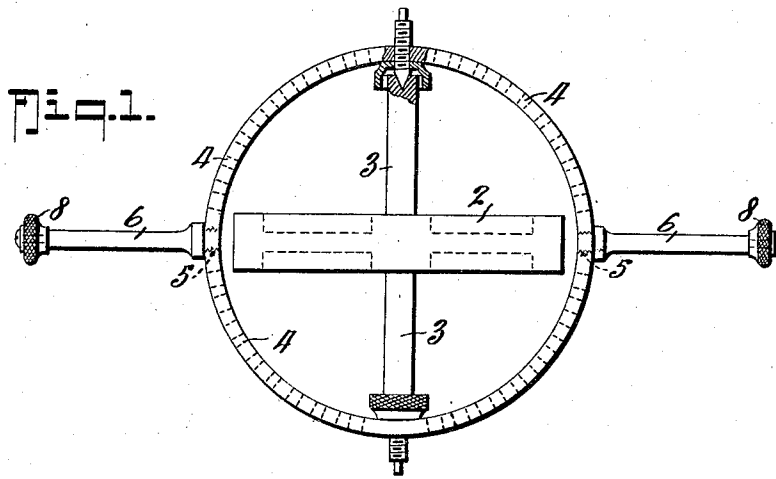
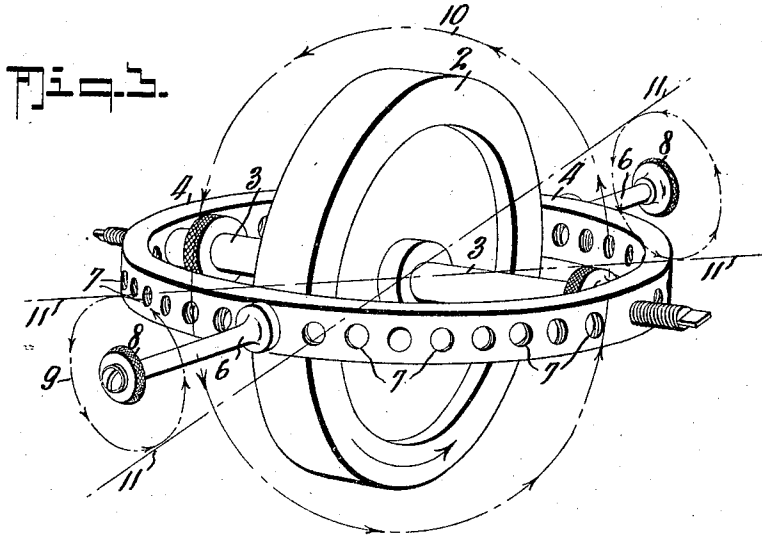
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J. E. LEMOINE

GYROSCOPE

Filed May 11, 1923



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# UNITED STATES PATENT OFFICE.

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GYROSCOPE.

Application filed May 11, 1923. Serial No. 638,340.

*To all whom it may concern:*

Be it known that I, JOSEPH E. LEMOINE, citizen of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented certain new and useful Improvements in Gyroscopes, of which the following is a specification.

This invention relates to a gyroscope, the improvement being directed to a provision permitting demonstration of what is believed to be a novel and peculiar characteristic of such instrument.

While a gyroscopic wheel has certain characteristics of stability, while rotating, due to the resistance which it offers to movement from the plane of its rotation, which characteristics can be demonstrated while the axle of the wheel is rotatably supported within a ring, there are other characteristics which cannot be displayed unless provision is afforded for supporting the ring in a manner that will give it freedom to move about an axis which is in the same plane as that on which the wheel rotates, but at an angle which intersects the axis of rotation.

The provision by which I am enabled to display these supplementary characteristics is fully described in the following specification, reference being made to the drawings by which it is accompanied, in which:

Fig. 1 is a plan of a gyroscopic wheel mounted in accordance with the requirements of this invention.

Fig. 2 is a side elevation of the same, and

Fig. 3 is a perspective view illustrating the novel movement of the gyroscopic device so mounted.

In these drawings 2 represents the wheel and 3 the axle on which it is secured. The ends of this axle are mounted on centres within a supporting ring 4 in the usual manner to afford the wheel and its axle freedom to rotate within the ring 4 with a minimum of frictional resistance.

In this supporting ring 4 are apertures 5 diametrically intersecting the axis of rotation of the wheel at right angles. These apertures 5 are threaded to receive removable trunnions 6 to project outward from the ring to diametrically intersect the axis of rotation and in the same plane as that axis. The outer ends of these trunnions have knobs 8 within which the trunnions are freely rotatable. In the ring 4 are other similar aper-

tures 7 diametrically intersecting the axis of rotation at various intermediate angles between the apertures 5 and the axis of rotation of the wheel 2.

If these trunnions 6 are applied to the apertures 5, which are at ninety degrees from the axis of rotation of the wheel, and if, while the wheel 2 is rotating rapidly, a circular movement is imparted to the end of one or the other of the trunnions 6, as indicated by the dot and dash lines 9 in Fig. 3 the gyroscope will exert a powerful effort to rotate the supporting ring 4 about the axis of the trunnions 6 in the direction of the circular movement imparted to its end, as shown by the dot and dash lines 10. If the circular movement of the trunnion end is reversed in direction, the rotation of the ring 4 will also reverse, although the direction of rotation of the wheel 2 is unchanged.

If the knobs 8 of the trunnions 6 are held, one in each end, and both ends are rotated in the same direction, but at one hundred and eighty degrees from one another, as indicated by the lines 11, the same effect is produced on the ring 4.

If the position of the trunnions 6 be moved to any of the apertures 7 which are diametrically opposite one another, but intersect the axis at angles less than ninety degrees, the rotational effort is produced on the ring 4 but the impulse is less and the movement quicker.

I am unable to explain to my entire satisfaction why this ring 4 should have an impulse to rotate about the trunnion axis when a circular movement is imparted to the end or ends of the axis, but the tendency is interesting and its investigation instructive, and I am not aware of any gyroscope having a provision enabling this movement to be demonstrated.

Having now particularly described my invention, I hereby declare that what I claim as new and desire to be protected in by Letters Patent, is:

1. In a gyroscope, the combination with a wheel having a preponderating rim weight and an axle on which this wheel is secured, of a ring within which the axle of the wheel is rotatably supported, trunnions connected to the ring to project outward from it, the axis of which trunnion lies in the plane and diametrically intersects the ring, and a separate member rotatably mounted on the end

of each trunnion, said separate member adapted to be held in the hand.

2. In a gyroscope, the combination with the rim of a wheel having a preponderating rim weight and an axle on which this wheel is secured, of a circular ring within which the axle of the wheel is rotatably supported, trunnions removably connected to the ring to project outward from it, the axis of which trunnions is in the plane of the ring and may be placed to diametrically intersect it at various angles to the axis of rotation.

3. In a gyroscope, the combination with the rim of a wheel having a preponderating rim weight and an axle on which this wheel is secured, of a circular ring within which the axle of the wheel is rotatably supported, trunnions removably connected to the ring to project from it, the axis of which trunnions is in the plane of the ring and may be placed to diametrically intersect it at various angles to the axis of rotation, and knobs

in which the trunnions are rotatably mounted.

4. In a gyroscope, the combination with a wheel having a preponderating rim weight and an axle on which this wheel is secured, of a ring within which the axle of the wheel is rotatably supported, trunnions removably connected to the ring the axis of which trunnions lies in the plane of the ring and diametrically intersects it, each trunnion having a knob within which the trunnion is rotatable.

5. In a gyroscope, the combination with a wheel having a preponderating rim weight and an axle on which this wheel is secured, of a ring within which the axle of the wheel is rotatably supported, said ring having a series of threaded apertures on diametrically opposite sides, and trunnions threaded to fit the apertures.

In testimony whereof I affix my signature.

JOSEPH E. LEMOINE.