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F. H. DONALDSON, E. H. OWEN & C. N. WILLIAMS.

GYROSCOPIC TOY.

(No Model.) (Application filed Aug. 19, 1897.)

Fig. 1.

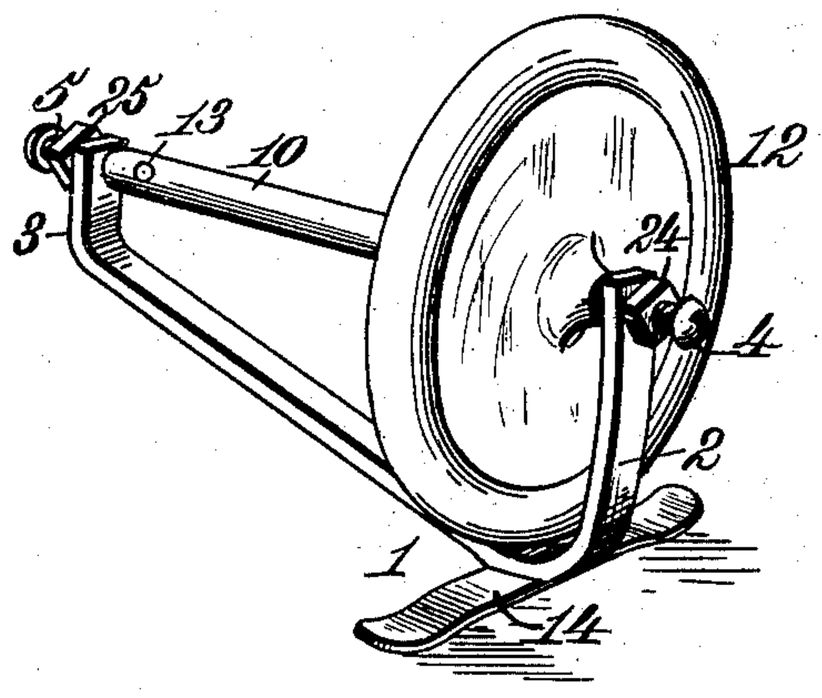


Fig. 2.

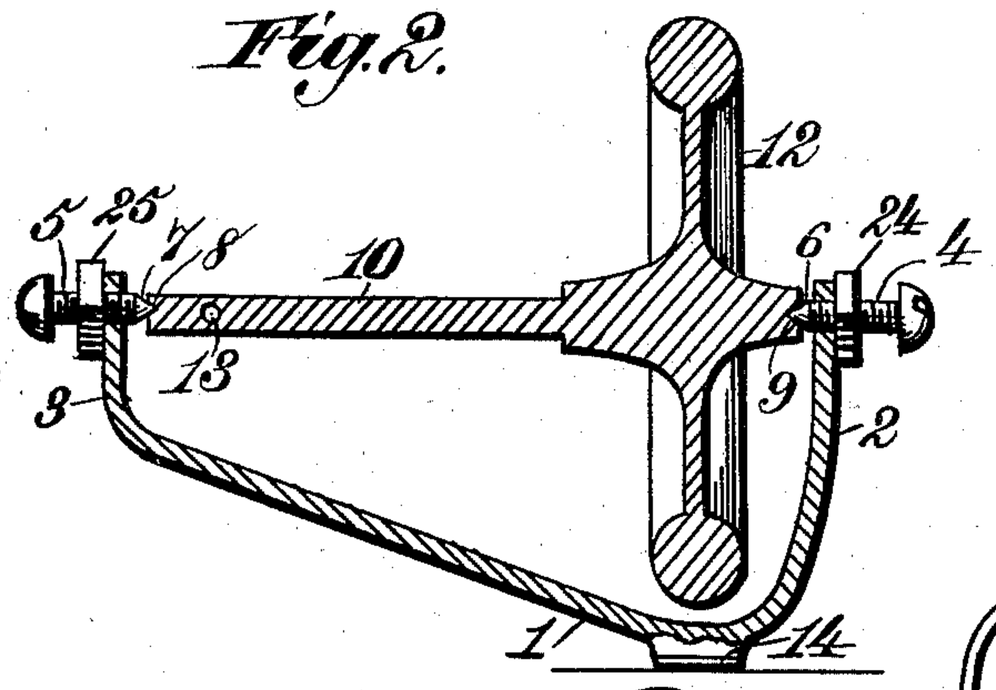


Fig. 3.

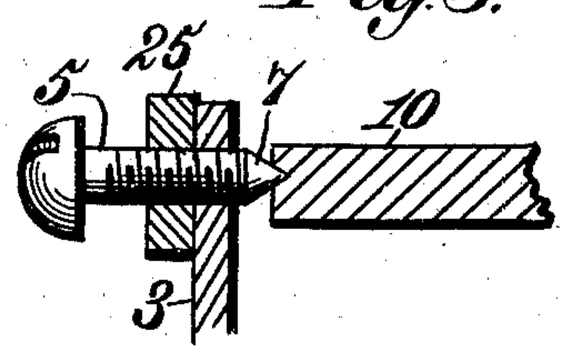


Fig. 4.

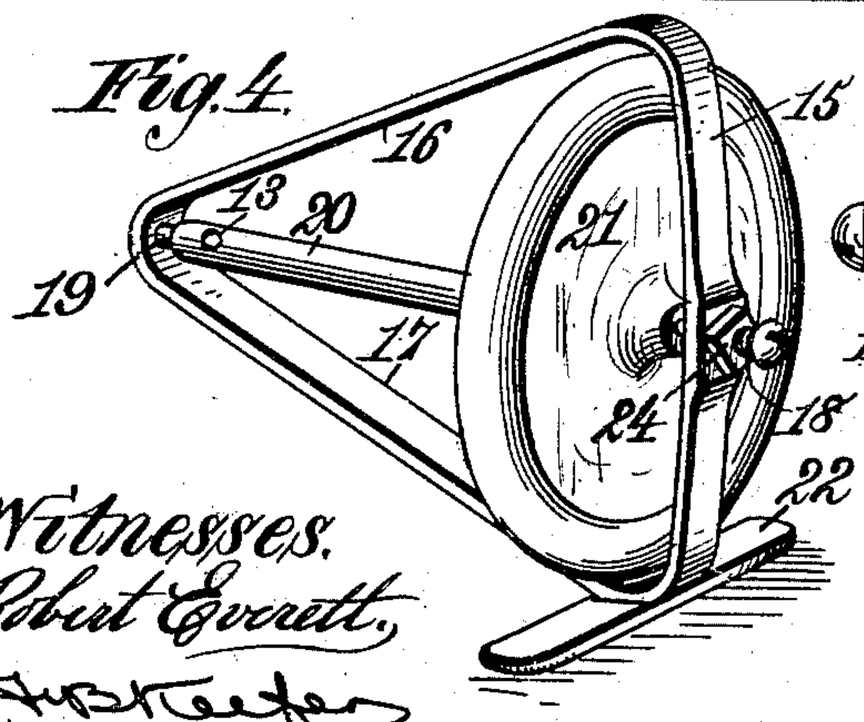
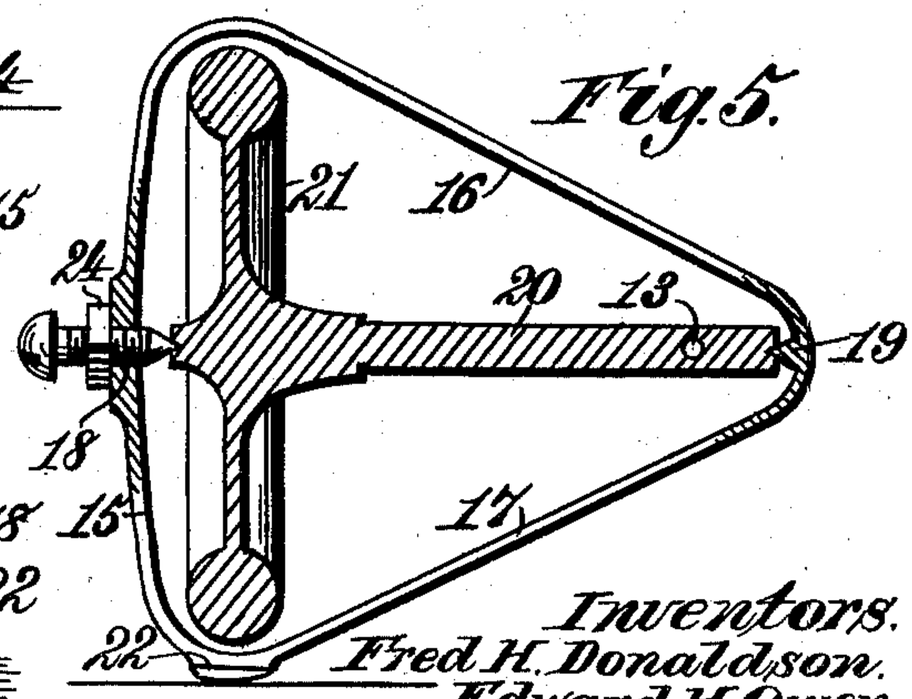


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRED H. DONALDSON, EDWARD H. OWEN, AND CHARLES N. WILLIAMS, OF GARVANZA, CALIFORNIA.

GYROSCOPIC TOY.

SPECIFICATION forming part of Letters Patent No. 609,332, dated August 16, 1898.

Application filed August 19, 1897. Serial No. 648,795. (No model.)

To all whom it may concern:

Be it known that we, FRED H. DONALDSON, EDWARD H. OWEN, and CHARLES N. WILLIAMS, citizens of the United States, residing at Garvanza, in the county of Los Angeles and State of California, have invented new and useful Improvements in Gyroscopic Toys, of which the following is a specification.

The chief object of our present invention is to provide an amusing gyroscopic toy which possesses such characteristic features of construction that if a part thereof which is susceptible of turning be whirled or swiftly rotated in a part which rests upon a comparatively smooth surface the toy as a whole will be balanced and with a tremulous motion traverse or slide more or less rapidly along or about the smooth surface on which it rests.

To accomplish this object, our invention consists, essentially, in a frame having spindle-bearings and a base or foot-piece constructed to rest upon and traverse the surface of a support, a spindle journaled on said bearings in a manner to be true with respect to one and eccentric with respect to the other, and a weighted body fixed on the spindle at or near one end thereof and of which the center of gravity is eccentric to the axis of rotation by virtue of said eccentric bearing.

The invention also involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described, and pointed out by the claims, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of our improved gyroscopic toy, showing its position while in operation. Fig. 2 is a longitudinal central sectional view of the same. Fig. 3 is a detail sectional view, on a larger scale, to more clearly illustrate the eccentric mounting of one end of the spindle. Fig. 4 is a perspective view showing a modification of the invention, and Fig. 5 is a longitudinal central sectional view of the modified construction.

In order to enable those skilled in the art to make and use our invention, we will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a frame composed of a narrow rectangular strip of metal or other material and having its ends provided with spindle-supporting arms or members 2 and 3, which are of different lengths and are provided with pivot-pins 4 and 5, having conical inner ends 6 and 7, fitted into pivot-bearings 8 and 9 in the ends of a spindle 10. The spindle is provided at or near the end which is supported by the pivot-pin 4 with a comparatively heavy body 12, which is preferably a disk or wheel of lead or any other metal or material sufficiently heavy for the purpose in hand. The spindle is also provided with an orifice 13, through which one end of a cord or string may be passed for the purpose of winding the cord or string upon the spindle, so that the latter and the disk or wheel can be whirled or swiftly rotated by pulling the string.

The frame is provided at or near the end having the long arm or member 2 with a transverse flattened foot-piece or shoe 14, which constitutes a base and projects a short distance from each side of the toy-frame to support the same in an upright position and assist the toy in sliding or moving on the comparatively smooth surface by which it is supported when in operation.

The pivot-bearing 9 at the end of the spindle farthest from the disk or wheel is slightly eccentric to the geometrical axis of the disk or wheel, the result being that when the spindle and the disk or wheel are whirled or swiftly rotated rapid vibrations are set up, by which means, if the base or foot-piece rests on a comparatively smooth surface while the spindle and the disk or wheel are swiftly rotated, the toy as a whole will traverse or slide with a tremulous motion on the foot-piece or shoe along or about the smooth surface, the speed of motion being in proportion to the speed of rotation of the spindle and the wheel. The swifter the motion of the spindle and the wheel the swifter will be the traversing or sliding motion of the toy along or about the smooth surface on which it rests. The exact causes which produce the traversing or sliding motions of the toy are not easily explained with precision, but theoretically the motions are due to the arrangement of the spindle, the eccentric mounting of one end thereof,

and the comparatively heavy body or wheel, whereby the rapid vibrations affect the supporting foot-piece or shoe rather than the disk or wheel, owing to the latter being much the heavier, thus imparting impulses to the foot-piece or shoe, which cause the toy to traverse or slide upon the smooth surface in the manner before explained. In addition to this the toy will also describe curves or move in a circular path on the smooth surface.

The motion of the disk or wheel whirling or swiftly rotating on a horizontal axis prevents the toy tipping backward or forward when in operation, while the foot-piece or shoe prevents it from tipping laterally.

The toy described and shown is novel, simple, and economical and affords the source of much amusement, due to the curious and, we may say, the inexplicable manner in which it slides or walks about while the spindle and the wheel are whirling.

In the modified construction illustrated by Figs. 4 and 5 the frame is triangular shaped and comprises the arms or members 15, 16, and 17. The conically-pointed pivot-pins 18 and 19 support the spindle 20, with its disk or wheel 21, in substantially the same manner as described with reference to Figs. 1, 2, and 3. The arm or member 15 is provided with a foot-piece or shoe 22, substantially the same as the foot-piece or shoe 14. It is unnecessary to specifically describe the operation of the modified construction, as it is essentially the same as that described with reference to Figs. 1, 2, and 3.

The pivot-pins by which the spindle is rotatably mounted are preferably in the form of screws, having lock-nuts 23 and 24, so that after the pivot-pins have been exactly adjusted they may be locked in their adjusted position, as will be obvious.

The eccentricity of the bearing at the end of the spindle farthest from the disk or wheel, though slight and not at once apparent to the eye, is important for the purpose in hand in that it produces the tremulous or vibratory motions of the foot-piece and frame by which the peculiar behavior set forth is obtained. We do not, however, confine ourselves to this precise eccentric mounting of the spindle.

Having thus described our invention, what we claim is—

1. A gyroscopic toy, consisting of a frame, having spindle-bearings and a base or foot-piece constructed to rest upon and traverse the surface of a support, a spindle journaled on said bearings in a manner to be true with respect to one and eccentric with respect to the other, and a weighted body fixed on the spindle at or near one end thereof and of which the center of gravity is eccentric to the axis of rotation by virtue of said eccentric bearing, substantially as and for the purposes described.

2. A gyroscopic toy, consisting of a frame having at its ends arms or members provided with spindle-bearings, a spindle journaled on said bearings in a manner to be true with respect to one and eccentric with respect to the other, a weighted body fixed on the spindle and of which the center of gravity is eccentric to the axis of rotation by virtue of said eccentric bearing, a transverse foot-piece or shoe secured to the frame for holding the latter upright when in motion, and means for whirling the spindle and the weighted body, substantially as and for the purposes described.

3. A gyroscopic toy, consisting of a frame having a base or foot-piece to rest upon and traverse the surface of a support, spindle-bearings carried by the frame, a spindle journaled on said bearings in a manner to be true with respect to one and eccentric with respect to the other, a weighted disk or wheel fixed on the spindle and of which the center of gravity is eccentric to the axis of rotation by virtue of said eccentric bearing, and means for whirling the spindle and weighted disk or wheel, substantially as and for the purposes described.

4. A gyroscopic toy, consisting of a frame having two spindle-bearings and a transverse foot-piece or shoe projecting from its opposite sides to sustain the frame upright while in motion, a spindle journaled on said bearings in a manner to be true with respect to one and eccentric with respect to the other, a weighted body fixed on the spindle and of which the center of gravity is eccentric to the axis of rotation by virtue of said eccentric bearing, and means whereby the spindle and the weighted body may be whirled, substantially as and for the purposes described.

5. A gyroscopic toy, consisting of a frame, carrying a rotatable, eccentrically-mounted wheeled spindle and constructed to rest upon and traverse a smooth-surfaced support when the wheeled spindle is whirled, substantially as and for the purposes described.

6. A gyroscopic toy, consisting of a frame, and a rotatable spindle having an attached weighted body and eccentrically mounted at one end with relation to the axis of the weighted body, substantially as and for the purposes described.

7. A gyroscopic toy, consisting of a frame carrying a rotatable spindle eccentrically mounted at one end and having an attached weighted disk, or wheel, and a foot-piece or shoe constructed to rest upon and traverse a smooth-surfaced support when the spindle and the disk, or wheel are whirled, substantially as and for the purposes described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

FRED H. DONALDSON.
EDWARD H. OWEN.
CHARLES N. WILLIAMS.

Witnesses:
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