H. F. DUNHAM.

ROLLING TOYS.

No. 183,549. Patented Oct. 24, 1876.

Fig. 1.

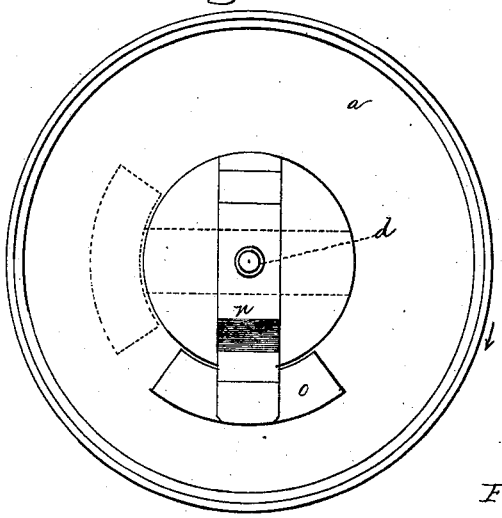


Fig. 5.

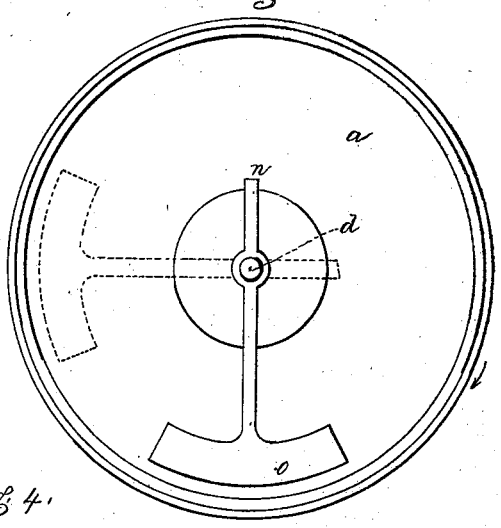


Fig. 4.

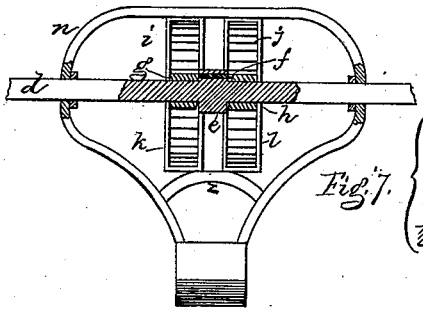


Fig. 3.

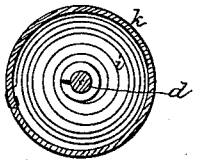


Fig. 7.

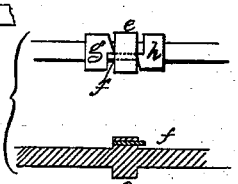


Fig. 2.

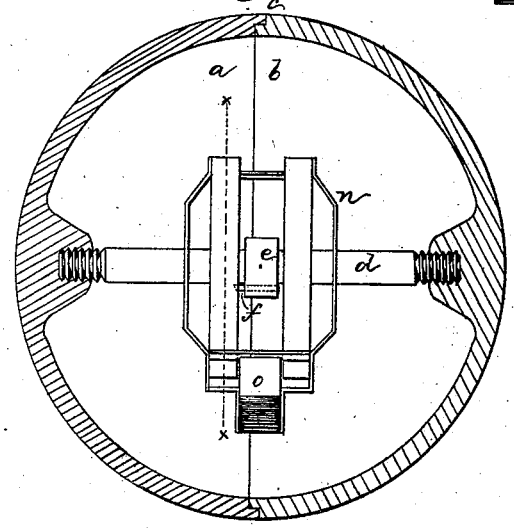
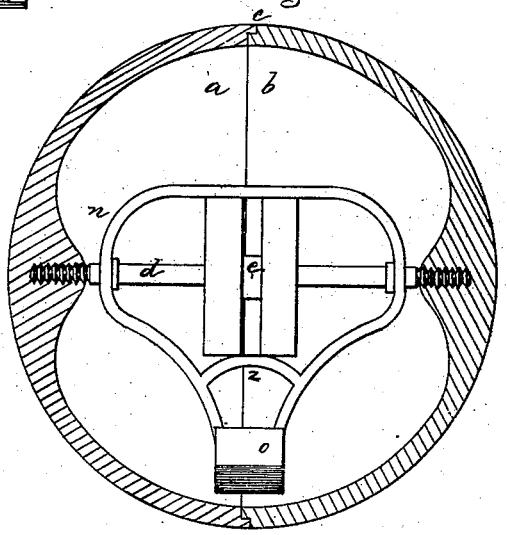


Fig. 6.



Witnesses.
L. H. Latimer.
W. J. Pratt.

Inventor.
Herbert F. Dunham
per Cooley & Gregory Attys

UNITED STATES PATENT OFFICE.

HERBERT F. DUNHAM, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN ROLLING TOYS.

Specification forming part of Letters Patent No. **183,549**, dated October 24, 1876; application filed April 3, 1876.

To all whom it may concern:

Be it known that I, HERBERT F. DUNHAM, of Springfield, in the county of Hampden and State of Massachusetts, have invented a Mechanical Globe, of which the following is a specification:

This invention relates to a mechanical globe, resembling in external appearance an ordinary globe or sphere; and consists in the combination, with a hollow sphere and fixed axis, of a weight and a coiled spring, adapted to raise the weight as the globe is rolled, and when the force applied to roll the globe has been expended in moving the globe and raising the weight, the weight and spring act to impart a reverse rotation to the globe, rolling it back in the direction of the point from which it was impelled.

If this globe be rotated by hand while its axis is horizontal, and then placed upon a level surface, it will immediately roll a considerable distance, forming a curious puzzle, since, to an observer, it will appear to be only an ordinary ball or sphere, which could have no power to put itself in motion. This globe may also be rolled down an inclined plane, when, without further application of force, it will return, rolling itself up the incline, thus appearing to act in direct opposition to the universal law of gravitation and the first law of motion.

Figure 1 represents my invention with one hemisphere removed; Fig. 2, a cross-section through the globe, showing the axis and weight; Fig. 3, a section on line *x x*, Fig. 2; Fig. 4, a cross-section through the spring-box and weight, in the form represented in Figs. 5 and 6, that represent this invention in the form in which I prefer to make it, the weight being differently shaped; and Fig. 7 represents details of construction of axis and collars, as used in Figs. 5 and 6.

The globe is composed of two concave or chambered hemispheres, *a b*, fitted closely at *c*, and firmly held together by an axis, *d*, each end being securely fastened to or screwed into a projecting portion at the center of each hemisphere. A short section of the axis at its center, as at *e*, is properly enlarged to admit of a transverse opening or passage for the guidance of a sliding pin, *f*, adapted to engage either one of the loose, shouldered, or notched collars *g h*. The inner ends of coiled springs *i* and *j* are fastened to these collars, and the springs are so arranged as to wind in opposite directions, and their outer ends are connected, respectively, with the cases *k l*. The weight *o* is suspended from the axis *d*, and the frame *n*, carrying the weight, is prevented from moving longitudinally with reference to the axis.

As the globe is rolled in the direction of the arrow, Figs. 1 and 5, as it will be when traveling in the direction toward the right-hand side of the drawing, the sliding pin *f* engages the notch or projection of the collar *g*, loose on the shaft, and connected with the inner end of the spring *i;* and as the weight *o* tends to prevent the case from turning with the globe, the outer end of the spring connected with the case is temporarily held, and the inner end of the spring, acted on by the sliding pin, is coiled or wound up, and when the globe has traveled a certain distance, the spring is wound sufficiently close to lift the weight to the position shown in dotted lines, Figs. 1 and 5, and when the momentum of the globe is overcome by the weight, then the weight, in descending to its first position, will act on the shaft through the spring, and will impel the globe in the opposite direction until the spring *i* is completely unwound; and if the globe be rolled farther in this direction, the sliding pin leaves the shoulder on the notched collar *g*, and moves over the cam-surface *p* of the collar, and is shifted to engage the projection of the correspondingly-shaped notched collar *h*, connected with spring *j*, and the latter to the case *l*, and the farther movement of the globe in that direction winds the spring *j*, and when the weight is lifted, the globe is again moved in the opposite direction, a globe in this way being made to move automatically backward and forward, and, because of the sliding pin and two springs and cases, the globe behaves the same, no matter in which direction it may move, so long as its axis is horizontal, or nearly so.

This device or movement may be used in a spheroid, or in a figure formed by combining a short cylinder and two hemispheres.

It is obvious that, without altering this invention, the springs might be attached to a plain axis, thus avoiding the use of collars, and the cases, each provided with a cam, per-

mitted to revolve with the axis and act upon the weight by means of the cams and a sliding pin placed in a suitable groove in the brace *z*, and acting as above described.

I claim—

1. As a new article of manufacture, a mechanical globe, provided with an axis and a weight, and a spring adapted to raise the weight, to move or reverse the movement of the globe, substantially as described.

2. The combination of the globe and axis with a weight and two springs, adapted to raise the weight, to move or reverse the movement of the globe, substantially as described.

3. The globe and its axis, in combination with the springs and weight and sliding pin, adapted to engage the notched collars, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HERBERT F. DUNHAM.

Witnesses:
A. T. FOLSOM,
C. M. SLOCUM.