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D. E. SITES

2,340,023

GLOBE

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Fig. 1.

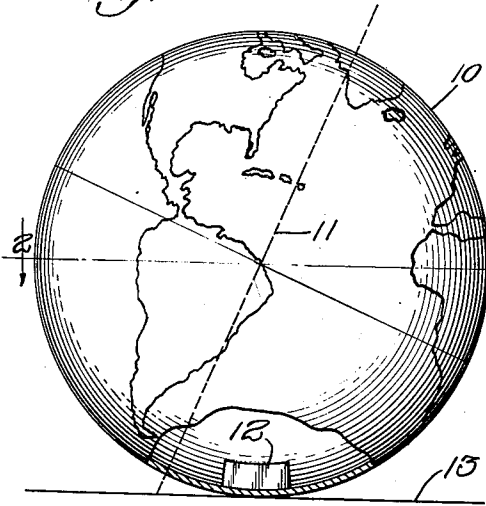


Fig. 2.

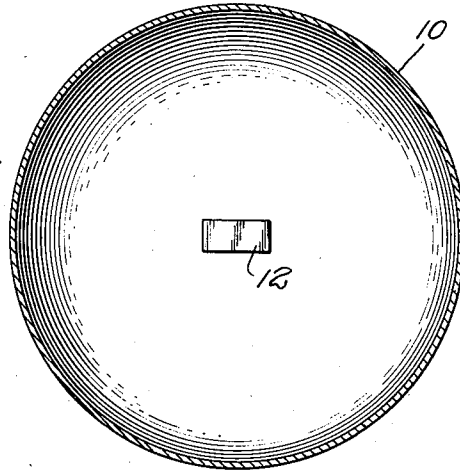


Fig. 3.

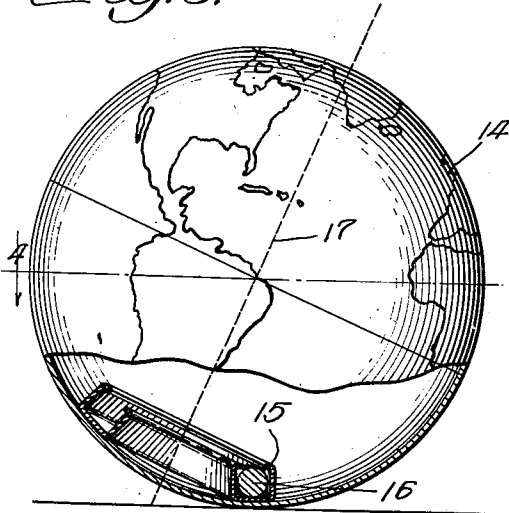


Fig. 4.

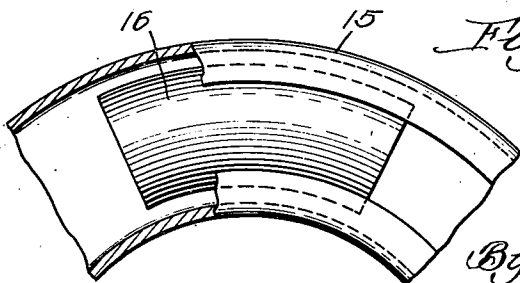
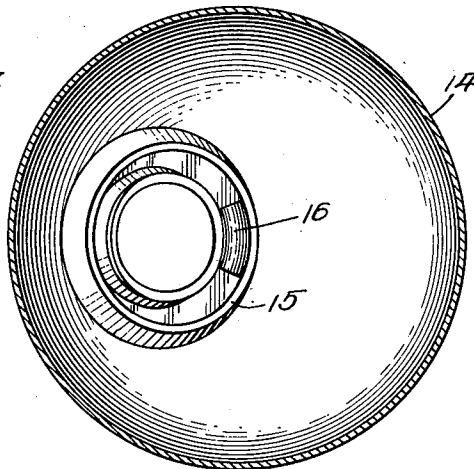


Fig. 5.

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UNITED STATES PATENT OFFICE

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GLOBE

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8 Claims. (Cl. 35—46)

This invention relates to a globe, and more particularly to a globe designed to assume a desired position when supported by and freely movable on a plane surface.

One feature of this invention is that it provides a globe adapted to assume a position with its polar axis having a correct inclination, without complicated mounting means; yet another feature of this invention is that it obviates the necessity for a mounting having a base, meridian ring, axis, and the like. Other features and advantages of this invention will be apparent from the following specification and drawing, in which:

Figure 1 is a side elevation, partly broken away, of a preferred form of globe embodying my invention; Figure 2 is a horizontal sectional view along the line 2 of Figure 1; Figure 3 is a side elevational view, partly broken away, of a modification of my invention; Figure 4 is a horizontal sectional view along the line 4 of Figure 3; and Figure 5 is a fragmentary detail view of the loading member and channel of this latter modification of my invention.

Globes used for purposes of illustration, instruction, and the like are generally either terrestrial or celestial. That is, the markings on the exterior surface of the globe may be earth and water bodies on the surface of the earth, etc., or the stars and constellations of the heavens. In either event, but particularly in connection with a terrestrial globe, it is desirable to have a certain axis of the globe, as the polar axis, at a given inclination. The polar axis of the earth has an inclination of about $23\frac{1}{2}^\circ$ from the perpendicular to the plane of its orbit, and a terrestrial globe should preferably have its polar axis with a similar inclination to the horizontal in order that the seasonal changes and other phenomena incident to such inclination may be best demonstrated and understood.

This inclination of the polar axis to the horizontal has heretofore been effected by mounting the globe on a pair of trunnions or a rod extending through the north and south poles, journaling this rod in bearings in a meridian ring, and mounting this ring in a base or stand, sometimes making it rotatable about a vertical axis. This requires fairly heavy and expensive parts to provide such a mounting. Other simpler methods of mounting have not resulted in ensuring a position of the globe with the desired inclination of the axis.

I am here disclosing and claiming a simple yet highly efficient arrangement which enables

a globe to be placed on a desk, table, or any other plane horizontal surface, and which causes the globe to assume a position with the axis at the desired inclination. I accomplish this by providing a loading member which causes the globe member, when supported by and freely movable on a plane surface, to assume the desired position. That is, the loading member displaces the center of gravity of the assembly from the center of the globe to a point or a line making a $23\frac{1}{2}^\circ$ angle with the axis.

Referring now more particularly to the preferred form of my invention shown in Figures 1 and 2, the globe is shown as comprising a hollow spherical member 10 adapted to have terrestrial or other markings on its outer surface, these markings including north and south poles, the dotted line 11 representing the polar axis. Within the globe and affixed to the interior surface of the spherical member is a loading member 12, here shown as rectangular in shape, which may be of lead or any other heavy metal. This loading member is so positioned that its center of gravity is displaced from the south pole of the globe through an arc which subtends a central angle about $23\frac{1}{2}^\circ$. When the globe is placed on a plane surface, here indicated as 13, with freedom to assume any position thereon, it assumes the position shown in Figure 1 with the center of gravity of the loading member 12 at the lowest point. This results in the globe automatically assuming a position such that the polar axis makes an angle with the plane surface which is the complement of the central angle subtended by the previously mentioned arc. That is, the polar axis makes an angle of about $66\frac{1}{2}^\circ$ with the horizontal, or has an inclination of about $23\frac{1}{2}^\circ$ from the vertical.

A globe embodying my invention may be easily handled or moved from place to place, and when it is held in the hands any desired portion of its surface may be readily examined or presented to a class, for example; yet when it is desired to illuminate the globe with a strong light from a fixed source simulating the sun, or otherwise illustrating many of the phenomena associated with the inclination of the earth's axis, it is necessary only to place the globe upon a level desk, table, or the like, whereupon it will automatically and immediately assume the position illustrated with the axis at the proper inclination to the vertical.

In the embodiment of this invention illustrated in Figures 1 and 2 the globe always assumes one given position, since the loading member is im-

movably affixed to the inner surface of the hollow sphere. In the embodiment of the invention illustrated in Figures 3, 4 and 5, however, the loading member may be shifted about within the globe, but is always constrained to movement adjacent the inner surface in a circle formed by rotating the outer end of a $23\frac{1}{2}^\circ$ arc about the south pole. While many means may be used for providing this movable but constraining mounting for the loading member, in this modified form of the invention the hollow spherical member 14 is shown as having a circular channel element 15 mounted on its inner surface, this channel element being adapted to slidably retain a loading member 16 therein. The loading member 16 is elongated, to avoid the free rolling movement of a ball, and the channel member has a diameter such that the center of gravity of the loading member 16 subtends a $23\frac{1}{2}^\circ$ central angle with the polar axis of the globe, indicated by the dotted line 17.

In this modification of this invention when the globe is placed on a desk or other plane surface it always assumes a position as illustrated in Figures 3 and 4, with the loading member at the lowermost position and the axis making an angle of about $66\frac{1}{2}^\circ$ with the plane surface. Since the loading member may be moved to any desired position in the channel by picking up the globe and turning it, with its axis inclined at any angle sufficient to cause the member to slide in the channel, until the loading member has slid to the desired position, the globe may be positioned with any desired portion of its surface facing in a given direction, yet always with the proper inclination of its polar axis.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. A globe of the character described adapted to be supported by a horizontal plane surface, including: a spherical member having markings thereon including north and south poles; and a loading member carried by said spherical member for causing it, when supported by and freely movable on said surface, to assume a position such that the axis through said poles makes an angle of about $66\frac{1}{2}^\circ$ with said surface.

2. A globe of the character described adapted to be supported by a horizontal plane surface, including: a hollow spherical member having markings on the outer surface thereof; and a loading member carried by said spherical member in engagement with the inner surface thereof, said loading member having its center of gravity displaced a predetermined arc from a certain axis of said spherical member, whereby the globe is caused, when supported by and freely movable on said plane surface, to assume a position such that said axis makes an angle with said plane surface which is the complement of the central angle subtended by said arc.

3. A globe of the character described adapted to be supported by a horizontal plane surface, including: a hollow spherical member having markings on the outer surface thereof providing a terrestrial globe, said markings including north and south poles determining the axis of said globe; and a loading member carried by said spherical member in engagement with the inner surface thereof, said loading member having its center of gravity displaced from said south pole through an arc of about $23\frac{1}{2}^\circ$, whereby the globe is caused, when supported by and freely movable on said plane surface, to assume a position such that said axis makes an angle with said plane surface which is the complement of the central angle subtended by said arc.

4. A globe of the character described adapted to be supported by a horizontal plane surface, including: a hollow spherical member having markings on the outer surface thereof providing a terrestrial globe, said markings including north and south poles determining the axis of said globe; a loading member; and means mounting said loading member within the spherical member for movement on the inner surface thereof in a circle subtending a central angle of about 47° and bisected by said axis, whereby the globe is caused, when supported by and freely movable on said plane surface, to assume a position such that said axis makes an angle of about $66\frac{1}{2}^\circ$ with said plane surface.

5. Apparatus of the character claimed in claim 4, wherein the loading member is non-spherical and the mounting means comprises a circular channel.

6. Apparatus of the character claimed in claim 2, wherein the loading member is fixedly attached to the inner surface of the spherical member.

7. A globe of the character described adapted to be supported by a horizontal plane surface, including: a hollow spherical member having markings on the outer surface thereof, said markings including north and south poles determining the axis of said globe; a loading member; and means mounting said loading member within the spherical member for movement on the inner surface thereof in a circle subtending a central angle of about 47° and bisected by said axis, whereby the globe is caused, when supported by and freely movable on said plane surface, to assume a position such that said axis makes an angle of about $66\frac{1}{2}^\circ$ with said plane surface.

8. A globe of the character described adapted to be supported by a horizontal plane surface, including: a hollow spherical member having markings on the outer surface thereof, said markings including north and south poles determining the axis of said globe; a loading member; and means mounting said loading member within the spherical member for movement on the inner surface thereof in a circle subtending a predetermined central angle bisected by said axis, whereby the globe is caused, when supported by and freely movable on said plane surface, to assume a position such that said axis makes a predetermined acute angle with said plane surface.

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