(No Model.)

2 Sheets—Sheet 1.

R. MOWERY.

TELLURIAN.

No. 571,785. Patented Nov. 24, 1896.

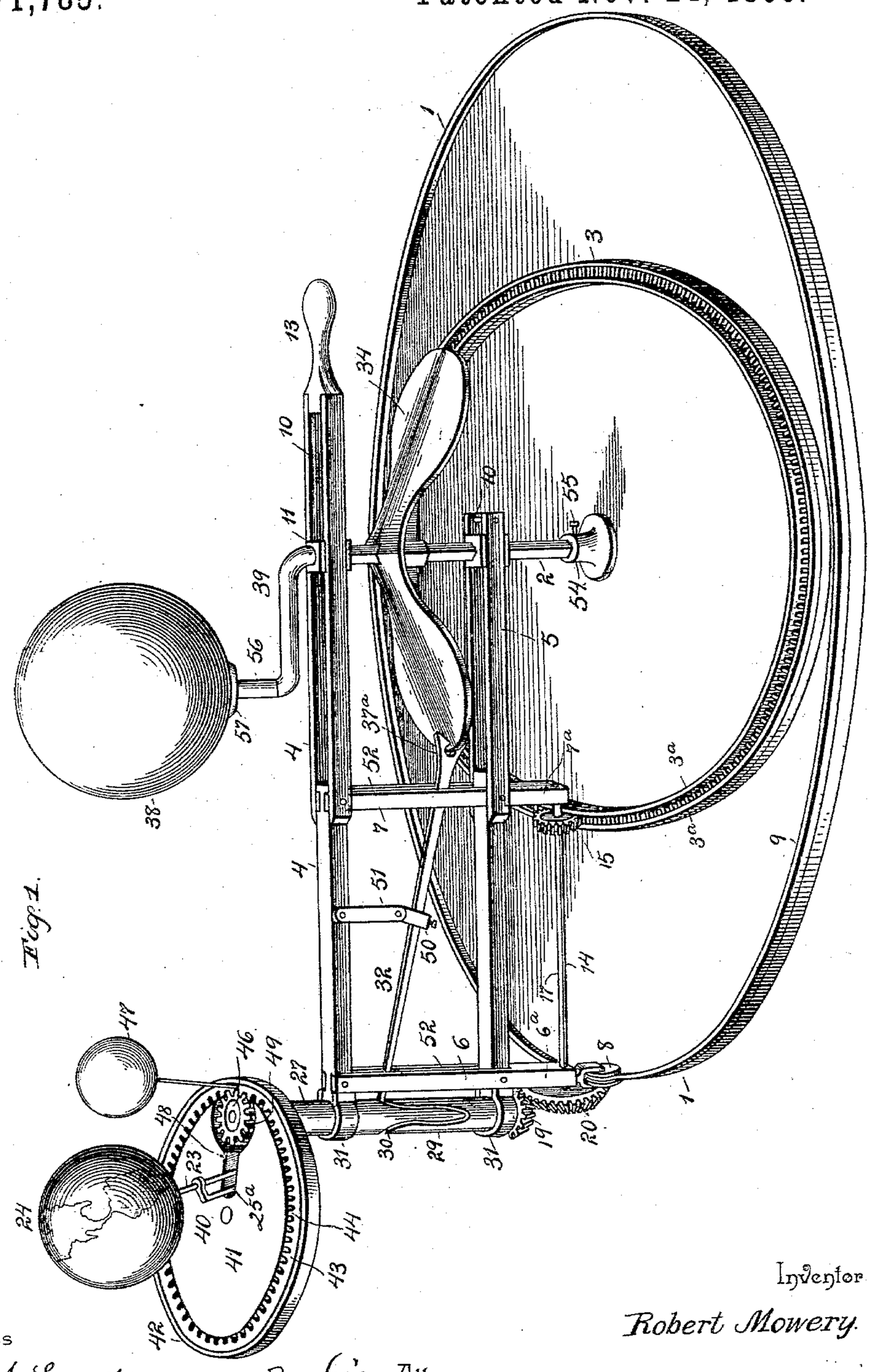

Fig. 1.

Witnesses

Victor J. Evans.

Inventor

Robert Mowery.

By his Attorneys,

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

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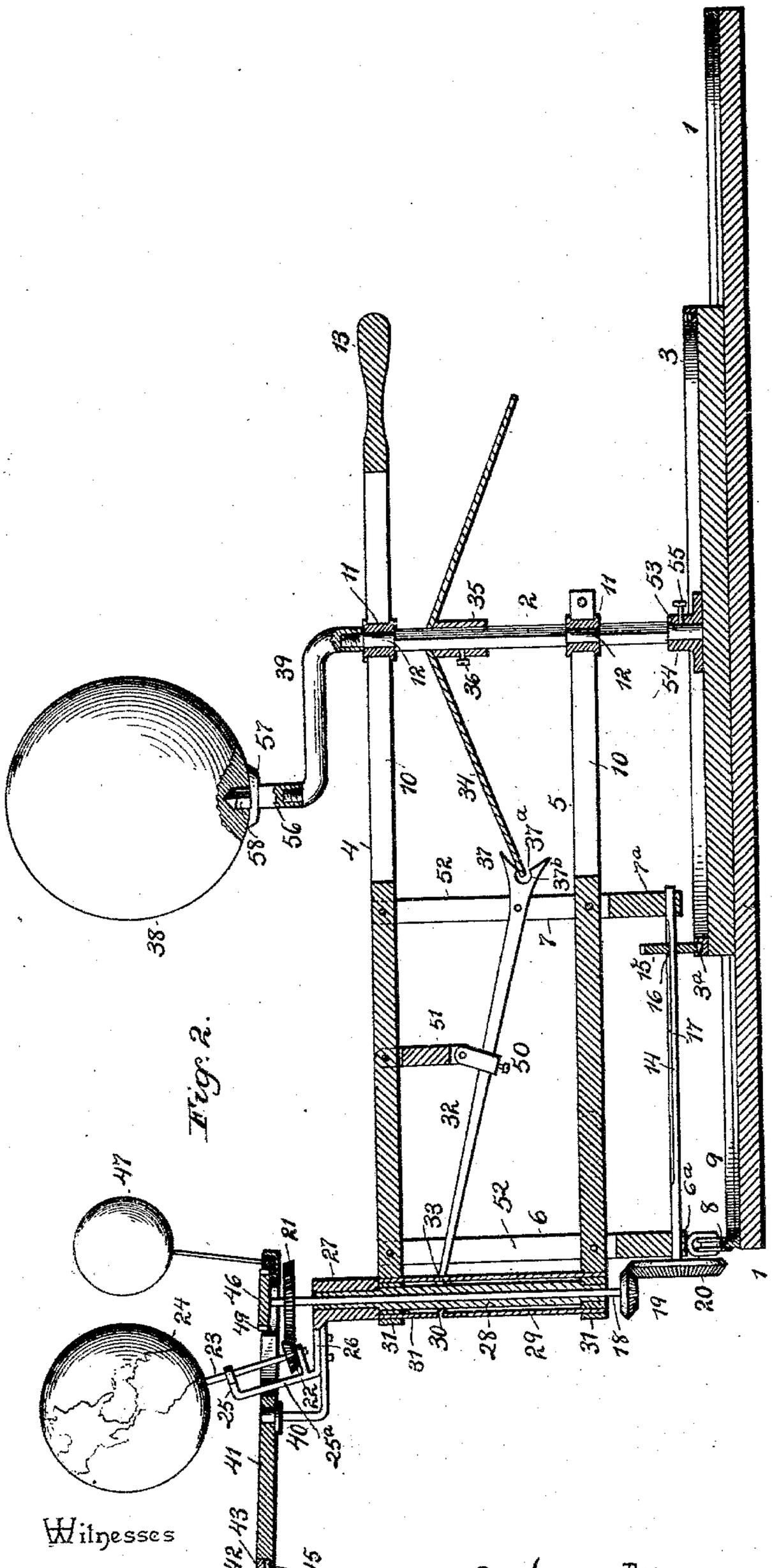

Fig. 2.

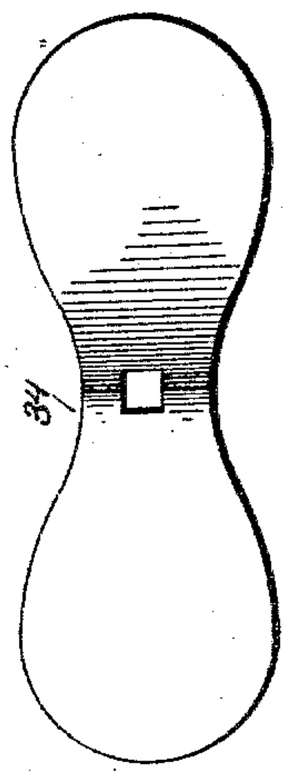

Fig. 3.

Witnesses

Victor J. Evans.

Inventor

Robert Mowery.

By his Attorneys,

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

ROBERT MOWERY, OF HOT SPRINGS, ARKANSAS, ASSIGNOR OF ONE-FOURTH TO JOHN H. KILGORE, OF SAME PLACE.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 571,785, dated November 24, 1896.

Application filed March 18, 1896. Serial No. 583,773. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MOWERY, a citizen of the United States, residing at Hot Springs, in the county of Garland and State of Arkansas, have invented a new and useful Tellurian, of which the following is a specification.

My invention relates to tellurians, and has for its object to provide a simple and efficient construction and arrangement of parts whereby the movements of the earth and moon with relation to the sun to cause day and night, the change of seasons, the vernal and autumnal equinoxes, the perihelion and aphelion, the phases of the moon, the ebb and flow of the tide, and eclipses are illustrated, means being provided to maintain the axis of the earth at its proper inclination in a uniform direction.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a tellurian constructed in accordance with my invention. Fig. 2 is a partial longitudinal section of the same. Fig. 3 is a plan view of the cam-guide detached.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a base or platform which is elliptical in plan to correspond with the orbit of the earth, and arranged upon this base or platform concentric with a central standard 2 is a circular rack 3. A sliding frame consisting of upper and lower parallel bars 4 and 5, connected by vertical outer and inner braces 6 and 7, is mounted at its inner end upon the standard 2, and is provided at its outer end with a supporting or guide roll 8 to traverse a peripheral track 9 on the base or platform, said track consisting of a flat band secured to the edge of the base and extending above the plane of the upper surface thereof. The bars 4 and 5 are longitudinally slotted to form ways 10, in which are mounted journal-blocks 11, fitted for rotary movement upon reduced spindle portions 12 of the standard, whereby the frame is free to rotate around the standard as a center and at the same time is capable of longitudinal movement caused by the supporting or guide roll 8 traversing the track, the distance of the track from the standard varying to accord with the elliptical shape of the base. The upper bar 4 is extended beyond the standard to form a handle or grip 13, and the supporting or guide roll 8 is mounted upon a depending extension 6^a of the outer brace 6. Mounted for rotation in suitable bearings formed in said extension 6^a of the outer brace and in the corresponding extension 7^a of the inner brace is a horizontal shaft 14, upon which is feathered a pinion 15, meshing with the rack 3, said rack being provided with inner and outer guard webs or flanges 3^a to maintain the pinion in operative relation therewith irrespective of the longitudinal or radial movement of the frame. In the construction illustrated the pinion 15 is provided with a feather 16 to operate in a groove 17.

The frame also supports at its outer end a vertical spindle 18, provided at its lower end with a bevel-gear 19, which meshes with a similar gear 20 on the outer extremity of the shaft 14, and is provided at its upper end with a gear 21 to mesh with a pinion 22 on the spindle 23 of the earth-globe 24. This spindle of the earth-globe is mounted in bearings 25, arranged in inclined alinement and supported by a bracket 26, and the bracket is provided with a collar 27, which is removably fitted upon and secured to the upper reduced end of a tubular or bearing shaft 28, whereby said bracket and shaft are adapted for simultaneous rotation. This bearing-shaft is fitted at its upper and lower extremities in bearings formed in the outer extremities of the bars or arms 4 and 5 and performs the function of a bearing for the spindle 18, and permanently fixed to said tubular shaft, which is thus disposed concentric with the said spindle, is a cylindrical shell 29, provided with a cam-slot 30, said shell being spaced from the shaft 28 by means of upper and lower collars 31, which are rigidly secured in place.

Mounted upon the frame for pivotal movement in a vertical plane is an operating-lever 32, which is arranged at its outer extremity in operative relation with the cam on the hollow shaft which forms the spindle of the bracket 26, carrying the earth-globe, and as in the construction illustrated the said cam consists of a groove the outer extremity of the lever is fitted in the groove with a head or button 33 in contact with the inner surface of the shell to prevent displacement and longitudinal vibration of the lever. The inner end of the lever operates in connection with a stationary cam-guide 34, preferably supported by the standard 2 and provided with a central collar 35, which is fitted upon the standard and is secured thereto by a set-screw 36. This cam-guide is double oval in plan and is double inclined in longitudinal section, and the periphery thereof, measured upon straight lines radiating from the standard, is at a uniform distance from the periphery of the base or platform, whereby as the frame rotates around the standard as a center the inner extremity of the lever 32, which is notched, as shown at 37, is permanently in engagement with the periphery of the cam-guide.

In operation the combined action of the lever 32, cam-guide 34, and the cam 30 is to turn the spindle 28 of the bracket 26 to correspond with the position of the frame upon the base or platform, said lever communicating motion to the spindle, whereby the inclination of the axis of the earth-globe is maintained in a uniform direction in all positions of the parts. This is necessary in order to illustrate the change of seasons and the vernal and autumnal equinoxes, as will be understood by those familiar with this art. The sun-globe 38 is supported by an elbowed extension 39 of the standard 2, whereby said globe is arranged eccentrically with relation to the base or platform, so that the positions of the earth in perihelion and aphelion may be illustrated with accuracy.

Supported by a disk 40 at the extremity of the bracket 26 is a table 41, arranged at a slight inclination downward in the direction of inclination of the axis of the earth-globe, and this table is provided with a circumferential seat 42, in which is mounted an annular carrier 43, provided with internal gear-teeth 44. Said carrier preferably rests upon antifriction supporting-rolls 45 in the seat 42, and the teeth thereof mesh with a pinion 46, secured to the upper extremity of the spindle 18, above the plane of the gear 21. This carrier supports a moon-globe 47, and during the rotation of the frame around the central standard 2 the moon-globe is caused to rotate in an approximately horizontal plane around the earth-globe, the plane of the orbit being, however, at an inclination to the axis of the earth-globe. The arm 25^a, which supports the bearings for the earth-globe spindle, extends upward through an opening or slot 48 in the table, and the pinion 46 operates in a circular opening 49.

In describing the above apparatus I have omitted to mention numerous details of construction which are important in so far as they contribute to the general completeness and compactness of the structure, and while they are not indispensable I have adopted them as the preferred means for carrying out my invention. Hence in the drawings I have illustrated the lever 32 as mounted by means of a pivotal or swiveled block 50 upon a hanger 51, depending from the upper frame-bar 4 between the vertical planes of the outer and inner braces 6 and 7, and said braces are vertically slotted between the planes of the upper and lower frame-bars 4 and 5, as shown at 52, to form guides for the extremities of the lever and prevent lateral vibration thereof. This vertical slotting of the braces 6 and 7 also facilitates the assembling of the parts of the frame, inasmuch as the bars 4 and 5 fit in the slots, the latter at the lower and the former at the upper extremities thereof, whereby the upper frame-bars close the upper ends of the slots. Furthermore, the lower reduced extremity 53 of the standard 2 is stepped in a socket 54 in the upper surface of the base or platform, and is secured in place by means of a set-screw 55, whereby it is held from rotation, and the elbowed extension 39 is formed of a separate bar threaded upon the upper extremity of the body portion of the standard. Affixed to the upper extremity of the elbowed extension is a stud 56, having a collar 57 to bear against the lower surface of the sun-globe and an angular portion or extension 58 to fit in a socket in the globe. Furthermore, the cam-guide 34 is constructed of sheet metal bent at its center in the plane of the standard 2 to decline toward its extremities, the bore of the collar 35 being cross-sectionally angular to correspond with the cross-section of the standard, and the notch in the extremity of the lever 32 is provided with a flared mouth 37^a, the walls of which converge toward the inner or circular portion of the notch to form a reduced throat 37^b, which is approximately equal in width to the thickness of the plate from which the cam-guide is struck.

From the above description it will be seen that I have provided mechanism for preserving the actual direction of inclination of the axis of the earth-globe, and in order to accomplish the same it is necessary to change the direction of inclination with relation to the rotary frame to accord with the varying position of said frame.

The cam-guide 34, by means of its collar 35 and set-screw 36, is vertically movable upon the standard to provide for adjustment to insure accurate coöperation between the parts and an efficient communication of move-

ment to the swiveled bracket 26, which supports the earth-globe.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a tellurian, the combination with a fixed sun-globe, of a rotary frame, a bracket swiveled upon the frame, an earth-globe having an inclined axis mounted upon the bracket and adapted to describe an orbit around the sun-globe, a fixed cam-guide, and a lever actuated by the cam-guide and operatively connected with said bracket to impart rotary motion to the bracket in accordance with the movement of the frame around its axis and preserve a uniform direction of inclination of the axis of the earth-globe, substantially as specified.

2. In a tellurian, the combination with a fixed sun-globe, of a rotary frame, a bracket swiveled upon the frame, an earth-globe having an inclined axis mounted upon the bracket, a shaft fixed to the bracket and carrying a cam, an operating-lever arranged with its outer extremity in operative relation with said cam, and a fixed cam-guide traversed by the inner end of the lever and adapted to impart a rocking movement thereto to cause rotary movement of said bracket and preserve a uniform direction of inclination of the axis of the earth-globe, substantially as specified.

3. In a tellurian, the combination with a fixed sun-globe, of a rotary frame, a vertical shaft carried by the frame, a cylindrical shell carried by the shaft and provided with a cam-groove, an earth-globe having an inclined axis carried by the shaft, a rocking lever arranged at its outer extremity in said cam-groove and mounted to operate in a vertical plane, and a fixed cam-guide arranged in operative relation with and traversed by the inner extremity of the lever, whereby rotary movement is imparted to the shaft to preserve the direction of inclination of the axis of the earth-globe, substantially as specified.

4. In a tellurian, the combination with a fixed sun-globe, of an elliptical track, a rotary frame arranged in a radial position with relation to the track, mounted at its outer end upon and adapted to traverse the track and slidably mounted at its inner end at the center of the space inclosed by the track, a bracket swiveled upon the frame, an earth-globe having an inclined axis mounted upon the bracket, a lever mounted upon the frame and operatively connected at one extremity with said bracket, and a fixed cam-guide traversed by the other extremity of the lever, the periphery of the cam being equidistant at all points from the track when measured upon straight lines radiating from the axis of rotation of the frame, substantially as specified.

5. In a tellurian, the combination with a fixed sun-globe, of an elliptical track, a central standard, a rotary frame slidably mounted at its inner end upon said standard and at its outer end upon the track, a rotary bracket mounted upon the frame and carrying an earth-globe having an inclined axis, a lever mounted upon the frame and operatively connected at its outer extremity with the bracket, and a cam-guide arranged concentric with the track and traversed by the inner extremity of said lever, said guide being double oval in plan and double inclined in longitudinal section, substantially as specified.

6. In a tellurian, the combination of a base having an elliptical track, a central standard rising from the base and provided with journal portions, a stationary sun-globe, a frame having parallel longitudinal bars mounted for rotation and sliding movement upon the journal portions of the standard and mounted at its outer end upon the track, a bracket mounted for rotation upon the frame and supporting an earth-globe having an inclined axis, a lever mounted upon the frame and operatively connected at its outer extremity with said bracket, and a double inclined cam-guide fixed to the standard with its periphery in engagement with a notch in the inner extremity of said lever, said cam-guide being peripherally equidistant from the track and having a central collar fitted upon and adjustably secured to the standard, substantially as specified.

7. In a tellurian, the combination of a base having an elliptical track, a central standard supporting a sun-globe, a rotary frame slidably mounted at its inner end upon the standard and mounted at its outer end upon said track, a circular rack concentric with said standard, an earth-globe mounted for rotation upon the frame and adapted to describe an orbit around the sun-globe, a spindle mounted upon the frame, a pinion feathered upon said spindle and meshing with the teeth of the rack, the rack having guard-webs to maintain the pinion in operative relation therewith, and connections between the spindle and the earth-globe, substantially as specified.

8. In a tellurian, the combination with a sun-globe and a rotary frame, a bracket swiveled upon the frame, an earth-globe having its axis mounted upon the bracket, operating devices for the earth-globe, means for imparting rotary movement to the bracket to maintain the axis of the earth-globe at a uniform inclination, an inclined table supported by said bracket and having an opening through which the axis of the earth-globe extends, whereby the earth-globe is arranged above the plane of the table, said table being provided

contiguous to its periphery with an annular seat, a carrier 43 mounted for rotation in said seat independently of the movement of the table and connections between the carrier and the means for operating the earth-globe, and a moon-globe supported by said carrier and adapted to describe an orbit around the earth-globe, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT MOWERY.

Witnesses:
FLOYD B. HALTOM,
R. W. HAUPT.