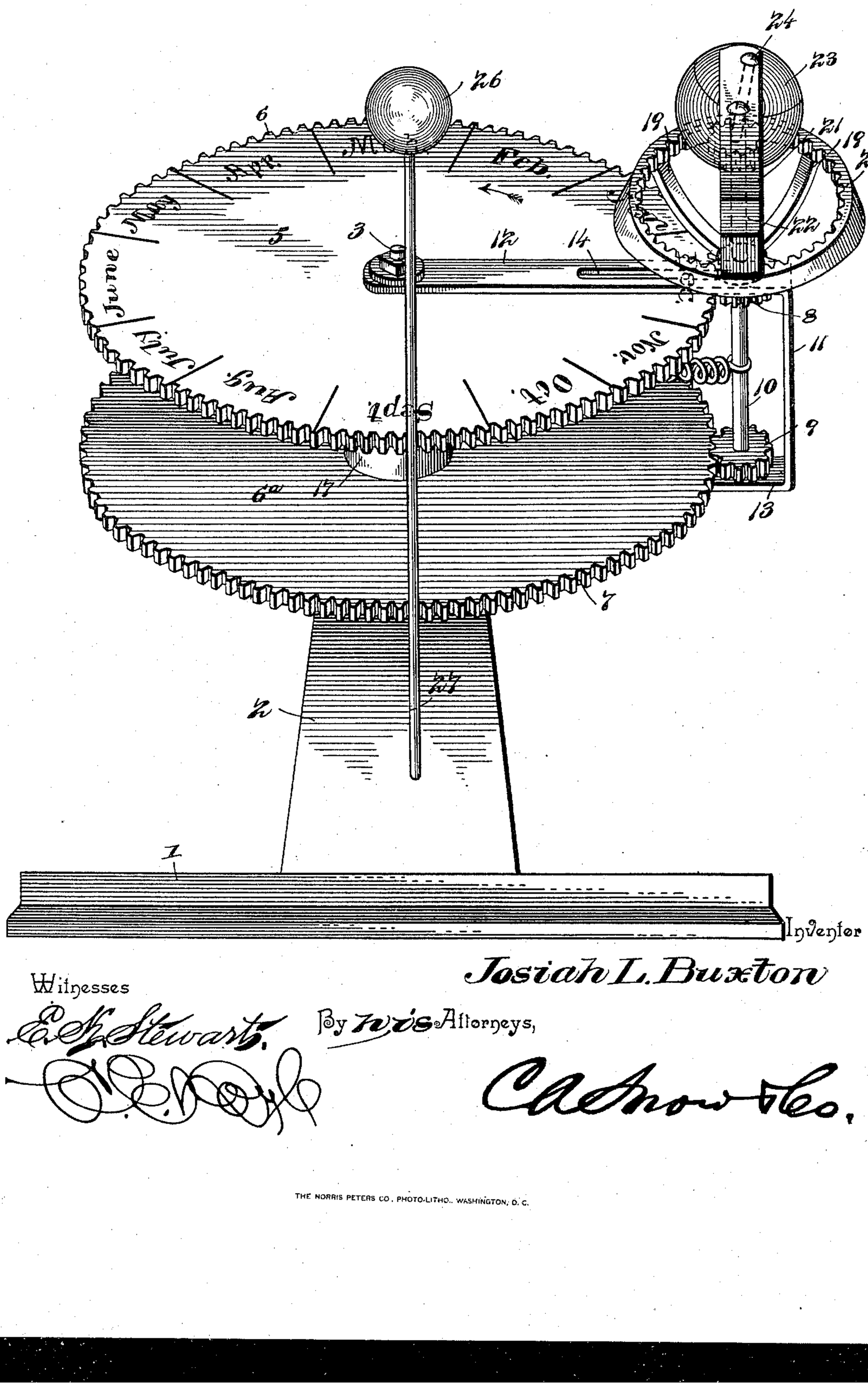
(No Model.) 2 Sheets—Sheet 1.

J. L. BUXTON.

TELLURIAN.

No. 584,851. Patented June 22, 1897.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

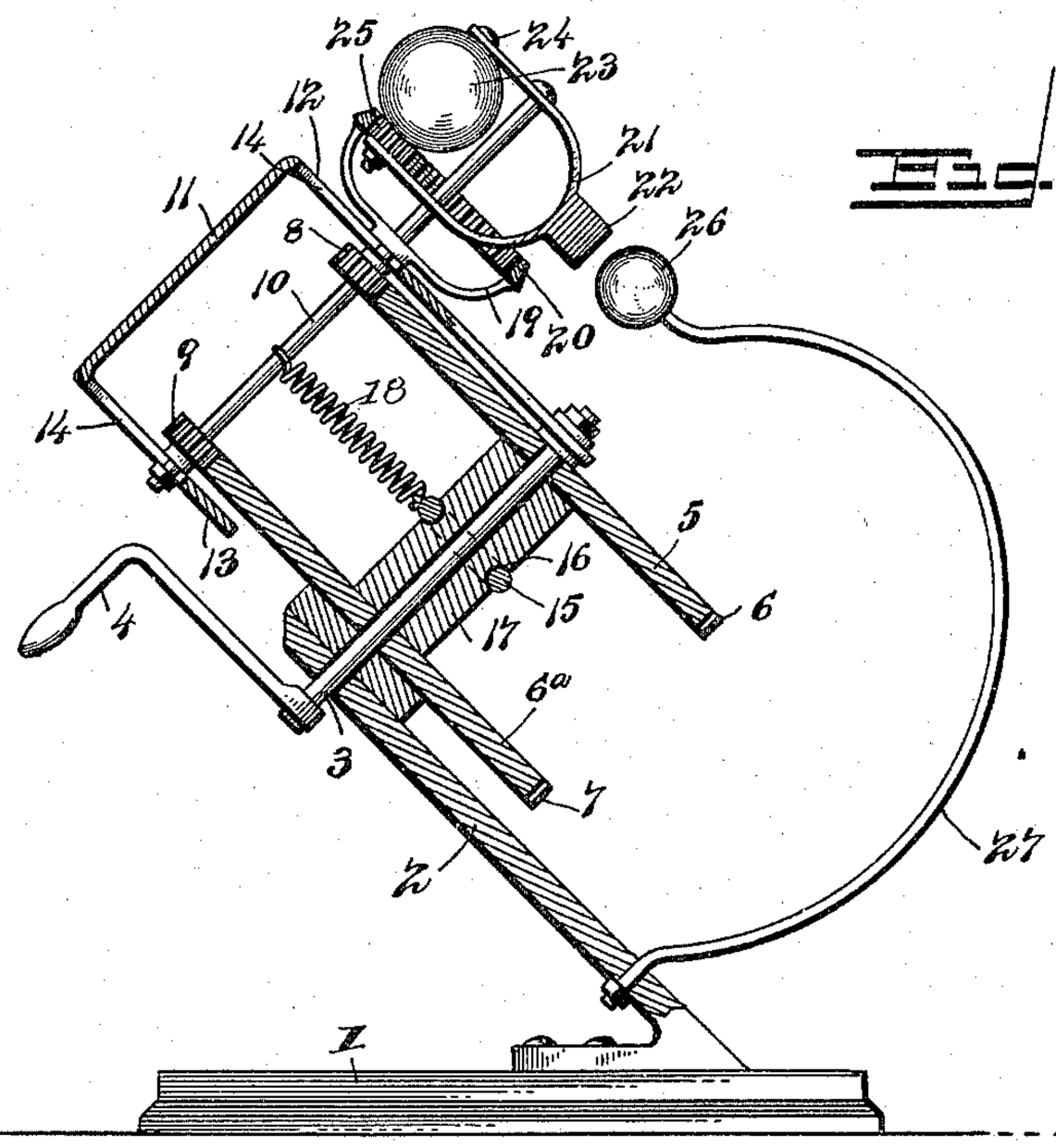
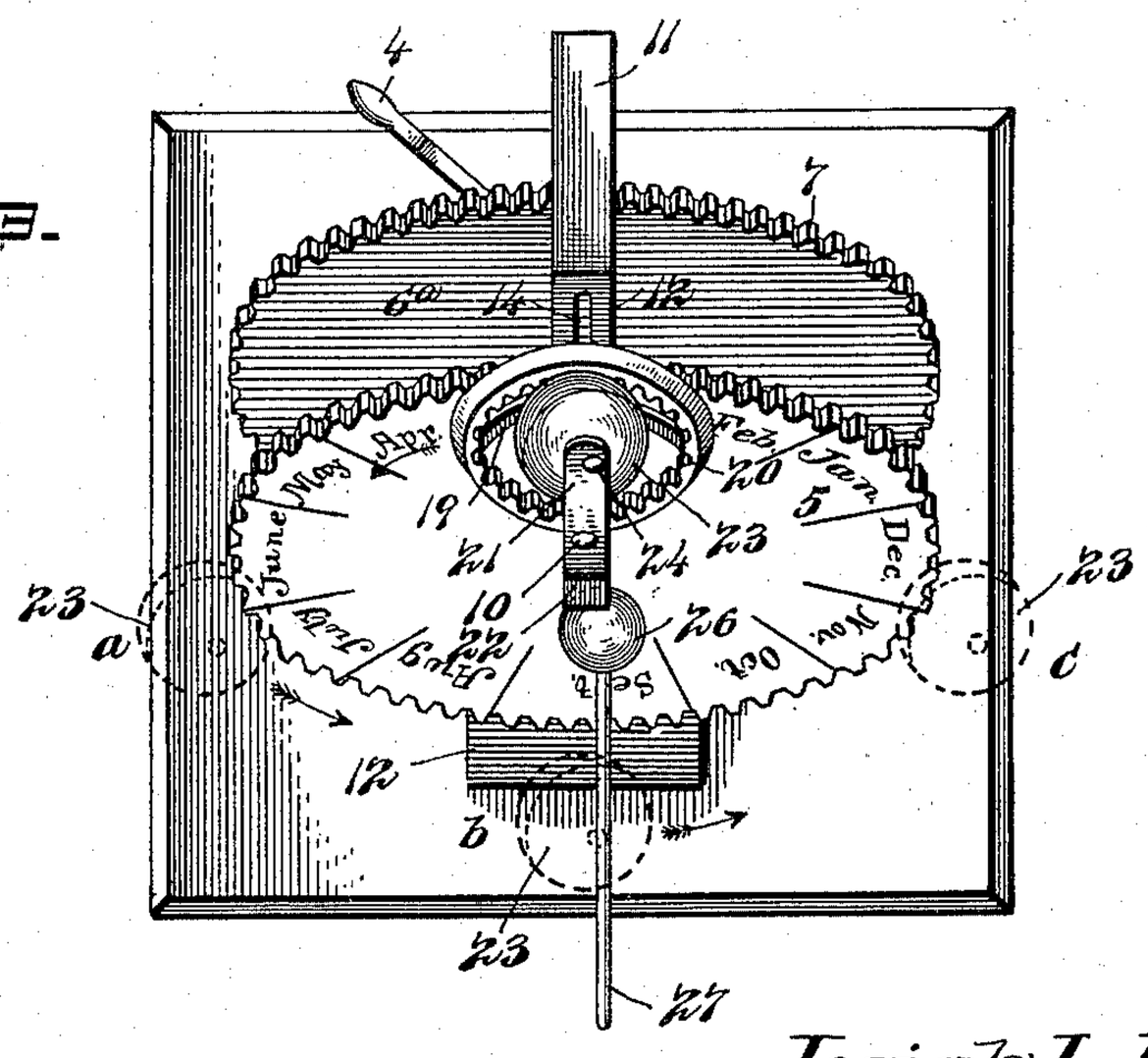


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSIAH L. BUXTON, OF IPSWICH, SOUTH DAKOTA.

TELLURIAN.

SPECIFICATION forming part of Letters Patent No. 584,851, dated June 22, 1897.

Application filed December 9, 1896. Serial No. 615,021. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH L. BUXTON, a citizen of the United States, residing at Ipswich, in the county of Edmunds and State of South Dakota, 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 simple and improved means for illustrating visually the movements of the earth about its axis and in its orbit, thus demonstrating the causes of day and night and the variations in the lengths thereof and the changes of the seasons.

A further object of the invention is to illustrate the effect of the motion of the earth in its elliptic path around the sun, together with the inclination of its axis to the plane of the elliptic upon the seasons and lengths of days at different points on the earth's surface.

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 front view of a tellurian constructed in accordance with my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a plan view of the ecliptic-plate, showing the sun and earth globes and the contiguous means for supporting the latter, the earth-globe being shown in dotted lines in a plurality of positions.

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

1 designates a suitable base having an inclined standard 2, upon which is mounted a rotary shaft 3, provided with a crank 4. Arranged perpendicular to this shaft is an elliptical plate 5, arranged in the plane of the ecliptic and provided with peripheral teeth 6. The periphery of this plate corresponds with the elliptical orbit of the earth, and it will be referred to in the following description as the "ecliptic-plate," the surface of the same being incribed contiguous to its periphery to form month-spaces in which are arranged the names of the months consecutively.

Parallel with the ecliptic-plate is an auxiliary elliptical plate 6^a, also provided with peripheral gear-teeth 7, and meshing with the peripheral gear-teeth upon the ecliptic and auxiliary plates are pinions 8 and 9, carried by a spindle 10. This spindle is mounted in a yoke-shaped swinging frame 11, having parallel upper and lower arms 12 and 13, arranged in planes respectively parallel with the surfaces of said plates, the upper arm 12 being extended and secured upon the shaft 3. The arms of the swinging frame are provided with registering longitudinal slots 14, in which is arranged the spindle 10 for radial movement with relation to the ecliptic and auxiliary plates, suitable yielding means being employed for normally holding the pinions on said spindle in engagement with the peripheral gear-teeth of said plates. In the construction illustrated these yielding means consist of a ring 15, fitted for rotary movement in a suitable seat 16 in the spacing-block 17 between said ecliptic and auxiliary plates, and a contractile spring 18, connecting said ring with the spindle. Thus as the swinging frame is moved around the central shaft as an axis the spindle is adapted to yield readily and thus maintain the pinions permanently in contact with the peripheral teeth of said plates, whereby rotary movement is communicated to the spindle. Carried by the spindle above the plane of the ecliptic-plate is a spider, of which the arms 19 support an internal gear 20, which is thus disposed concentrically with the spindle and is adapted to receive rotary movement therewith.

Fulcrumed upon the portion of the spindle above the plane of the internal gear is a stirrup 21, weighted at its looped end, as shown at 22, to maintain it normally in a vertical plane, and mounted between the free ends of the stirrup is an earth-globe 23, having a spindle 24, fitted in bearings in the stirrup and carrying a pinion 25, which meshes with the internal gear. Thus during the operation of the apparatus the stirrup, which is swiveled upon the spindle carrying the pinions 8 and 9, is normally held by gravity with the earth-globe uppermost, and the earth-globe receives rotary movement about its axis by means of the intermeshing internal gear and pinion 25.

The spindle of the earth-globe is inclined

to the plane of the ecliptic (represented by the ecliptic-plate) by the opposite lateral deflection of the upper and lower arms of the stirrup from a vertical plane, whereby as the position of the earth-globe in its orbit varies with relation to the position of the sun-globe 26, which is supported above the ecliptic-plate, lines connecting the centers of the sun and earth globes will intersect the surface of the latter either in the plane of the equator or above or below the same. Hence when the earth-globe is located at that part of its orbit designated upon the ecliptic-plate as "March," and as illustrated in full lines in Fig. 3, it will be in that position which the earth occupies with relation to its orbit when the rays of the sun fall perpendicularly upon the equator, the particular part of the month being the 20th. From this point the earth-globe moves in the direction indicated by the arrows in Figs. 1 and 3 until it occupies a position representing that occupied by the earth on June 21, (shown in dotted lines at *a*, Fig. 3,) when, owing to the inclination of the axis of the earth toward the sun, the portion of the surface of the earth-globe above the plane of its equator will be presented toward the sun-globe to illustrate that at the period mentioned the surface of the earth above the plane of its equator is exposed to the direct or perpendicular rays of the sun, thus illustrating the causes for the increased heat in the northern hemisphere during the summer months. As the movement of the earth-globe in its orbit is continued the plane of its equator again approaches a position corresponding with that occupied when in the first position above referred to, as shown in full lines in Fig. 3, when in a position representing September 22, as shown in dotted lines at *b*, Fig. 3, the plane of the equator is exposed to the direct rays. Further continued, the movement of the earth-globe brings it to a position indicated upon the ecliptic-plate as "December," and when at a point corresponding with the 23d of that month, as shown in dotted lines at *c*, Fig. 3, the portion of the earth-globe below the plane of its equator is exposed to the direct rays of the sun to illustrate the fact that the southern hemisphere is exposed to the direct rays of the sun during the winter months.

In an analogous way the relative lengths of daylight and darkness during the different seasons at different points upon the surface of the earth may be readily illustrated.

The sun-globe is supported in its position by means of a curved rod 27, which is spaced intermediately from the peripheries of the ecliptic and auxiliary plates a sufficient distance to allow the carrier, with the earth-globe and contiguous parts, to operate without interference.

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 of an inclined ecliptic-plate arranged in the plane of the ecliptic with relation to a contiguous sun-globe, a swinging carrier-frame, a spindle mounted upon the carrier-frame perpendicular to the plane of the ecliptic-plate, means for communicating rotary motion to the spindle during the movement thereof around and parallel with the periphery of the ecliptic-plate, a stirrup swiveled at an intermediate point upon the spindle and yieldingly held by gravity in its normal position, an earth-globe having its spindle mounted in bearings in the upper ends of the arms of the stirrup at an inclination to the plane of the ecliptic-plate, and gearing for conveying rotary motion from the first-named spindle to the earth-globe, substantially as specified.

2. In a tellurian, the combination of an inclined ecliptic-plate of elliptical shape arranged in the plane of the ecliptic with relation to a contiguous sun-globe, and provided with indicating devices designating different seasons of the year, a swinging carrier-frame mounted for movement parallel with the plane of the ecliptic-plate, a spindle mounted upon the carrier-frame and yieldingly held at a uniform distance from the periphery of the ecliptic-plate, said spindle being perpendicular to the plane of the ecliptic-plate, means for communicating rotary motion to said spindle during its movement around the ecliptic-plate, a stirrup mounted at an intermediate point upon said spindle and weighted at one end to hold it yieldingly in its normal position, an earth-globe mounted between the arms of the stirrup at the opposite end from the weight, and an internal gear carried by the spindle contiguous to the plane of the stirrup, the earth-globe being provided with a pinion meshing with the internal gear, whereby rotary motion is communicated from the spindle to the earth-globe, substantially as specified.

3. In a tellurian, the combination of parallel-spaced elliptical ecliptic and auxiliary plates arranged parallel with the plane of the ecliptic and provided with peripheral gear-teeth, a sun-globe arranged contiguous to the ecliptic-plate, a swinging carrier-frame having slotted upper and lower arms arranged respectively contiguous to the planes of said plates, an operating-shaft arranged concentrically with the plates and having one of the arms of the swinging frame attached thereto, a spindle mounted for radial movement in alined slots in the arms of the carrier-frame, for movement toward and from the peripheries of the plates, and carrying pinions meshing with the gear-teeth thereon, a stirrup

swiveled upon the said spindle, an earth-globe mounted between the arms of the stirrup with its axis at an inclination to the plane of the ecliptic-plate, an internal gear carried by said spindle and meshing with a pinion on the earth-globe, and yielding means for maintaining the pinion on said spindle in engagement with the gear-teeth of the plates, said means consisting of a ring seated upon a spacing-block between the plates, and a contractile spring connecting said ring with the spindle, 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.

JOSIAH L. BUXTON.

Witnesses:
GEO. C. MEADOWS,
J. W. PARMLEY.