

D. E. BRANDT.

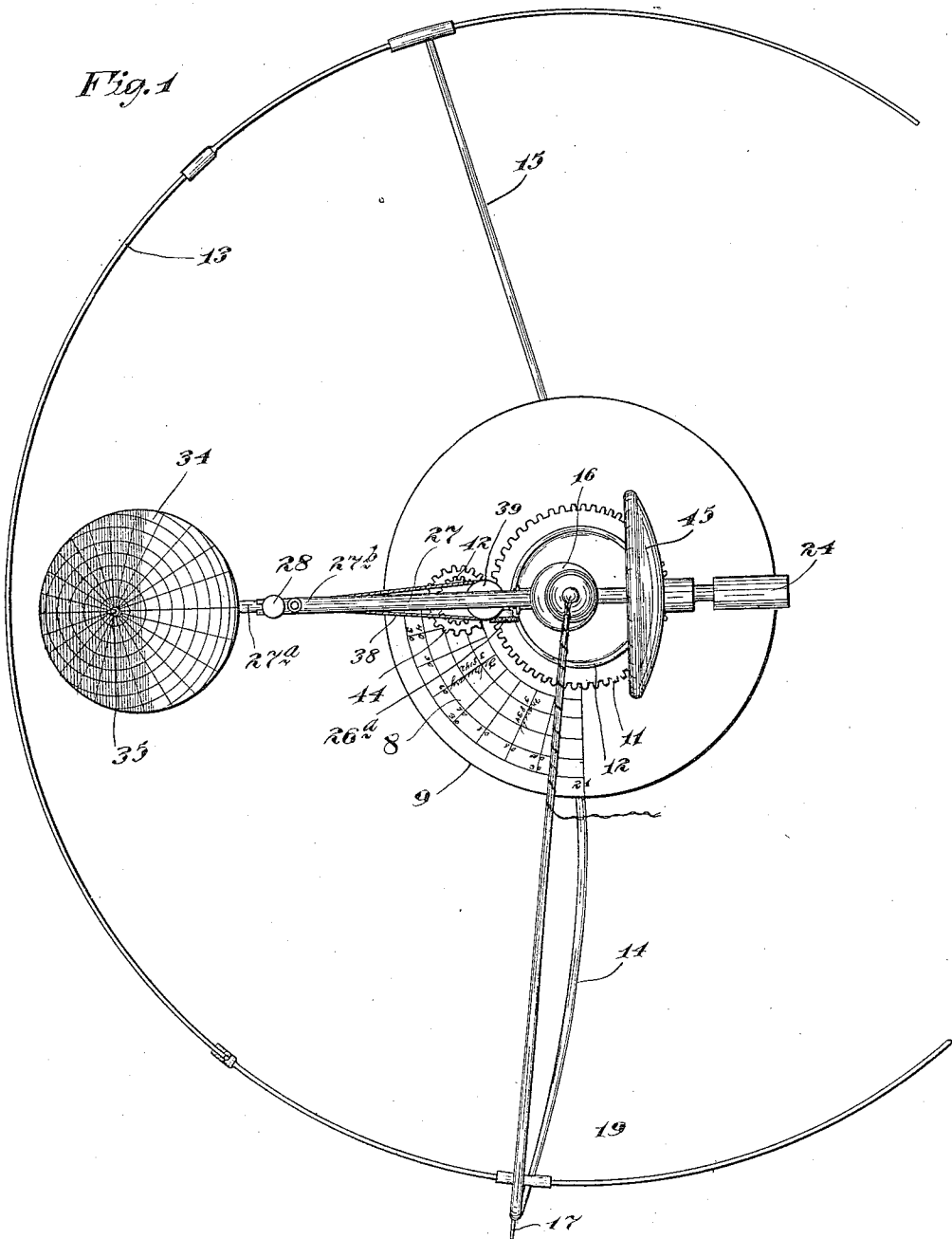
TELLURIAN.

APPLICATION FILED DEC. 14, 1911.

Patented Dec. 3, 1912.

4 SHEETS-SHEET 1.

1,045,808.



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E. C. Skinkle

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Fig. 2

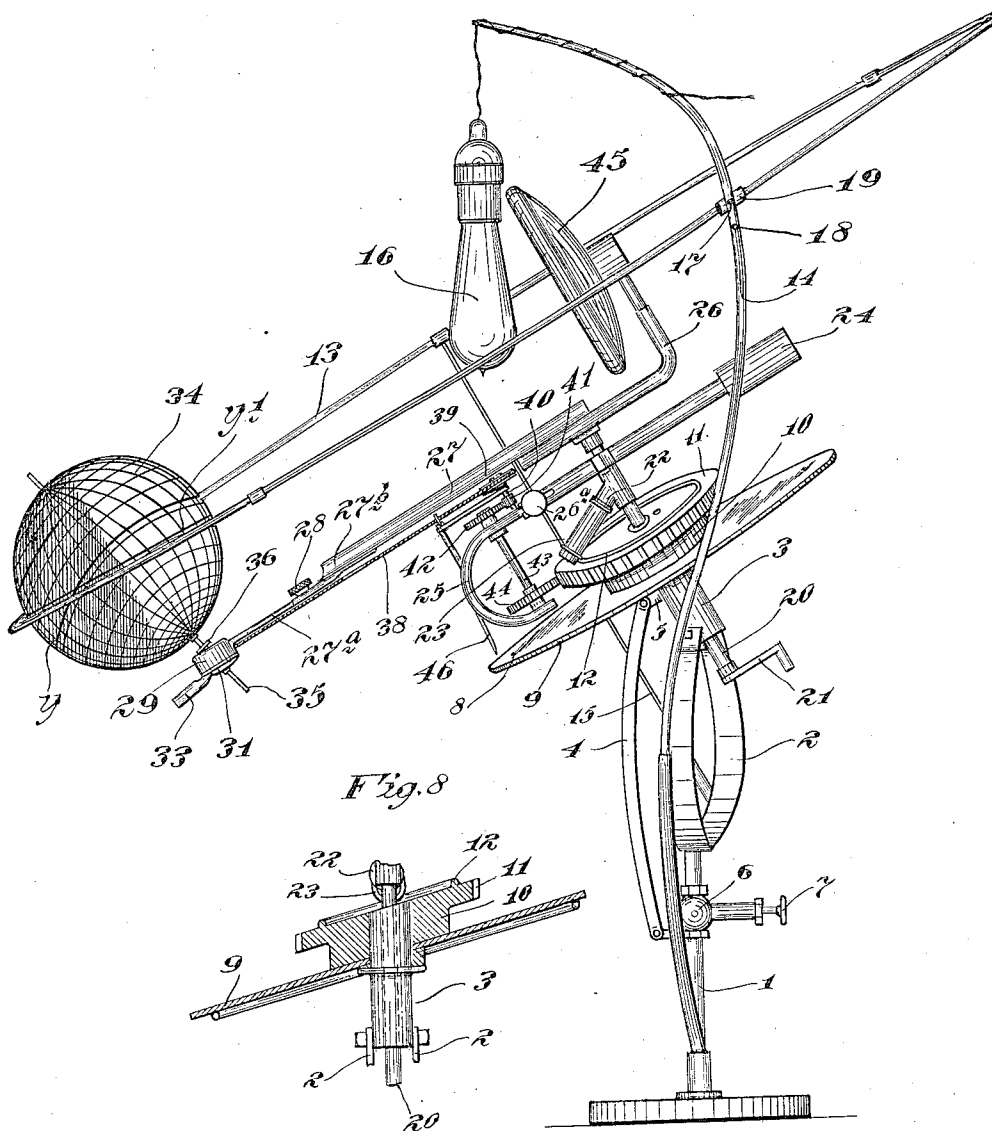


Fig. 8

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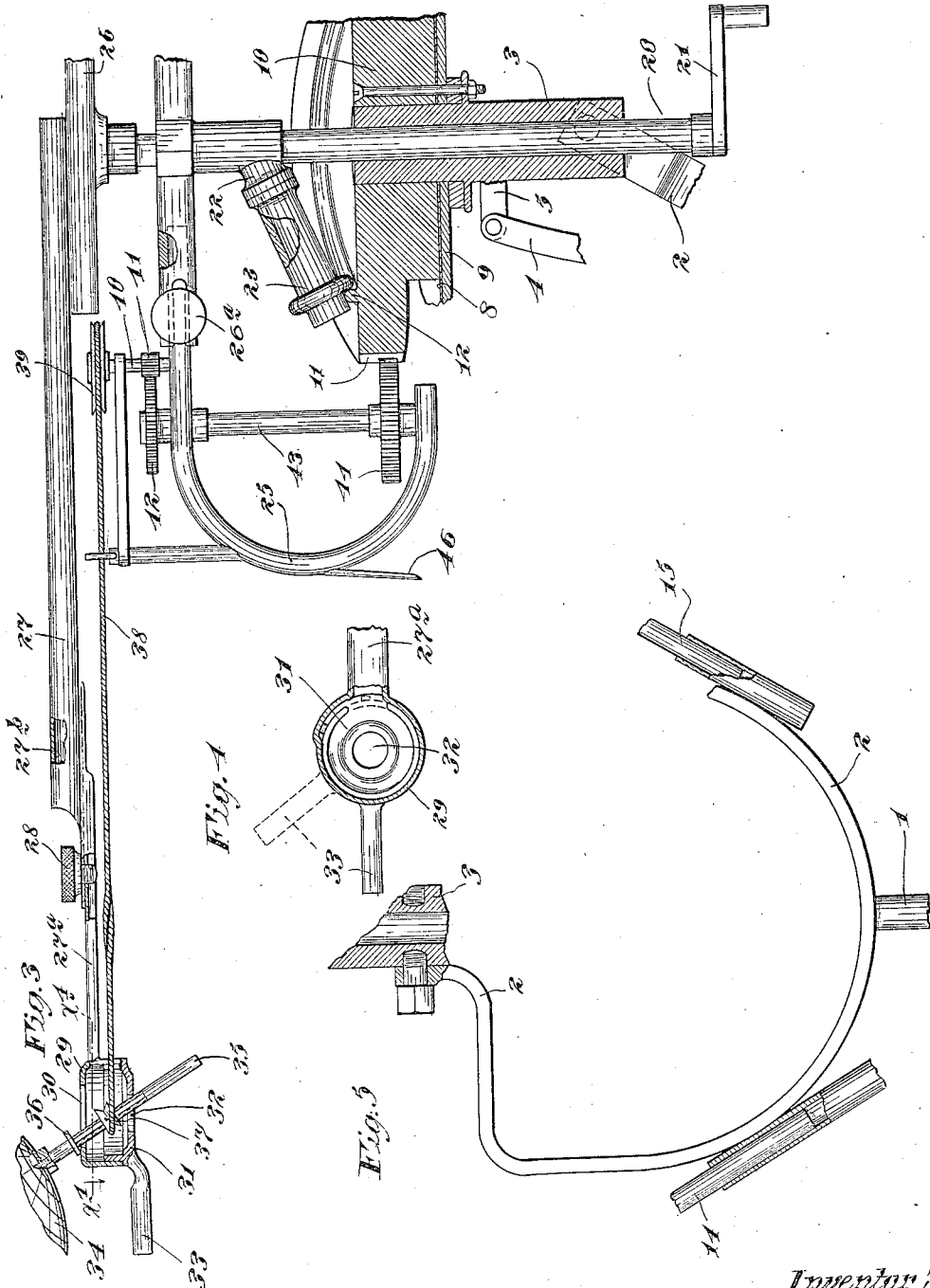
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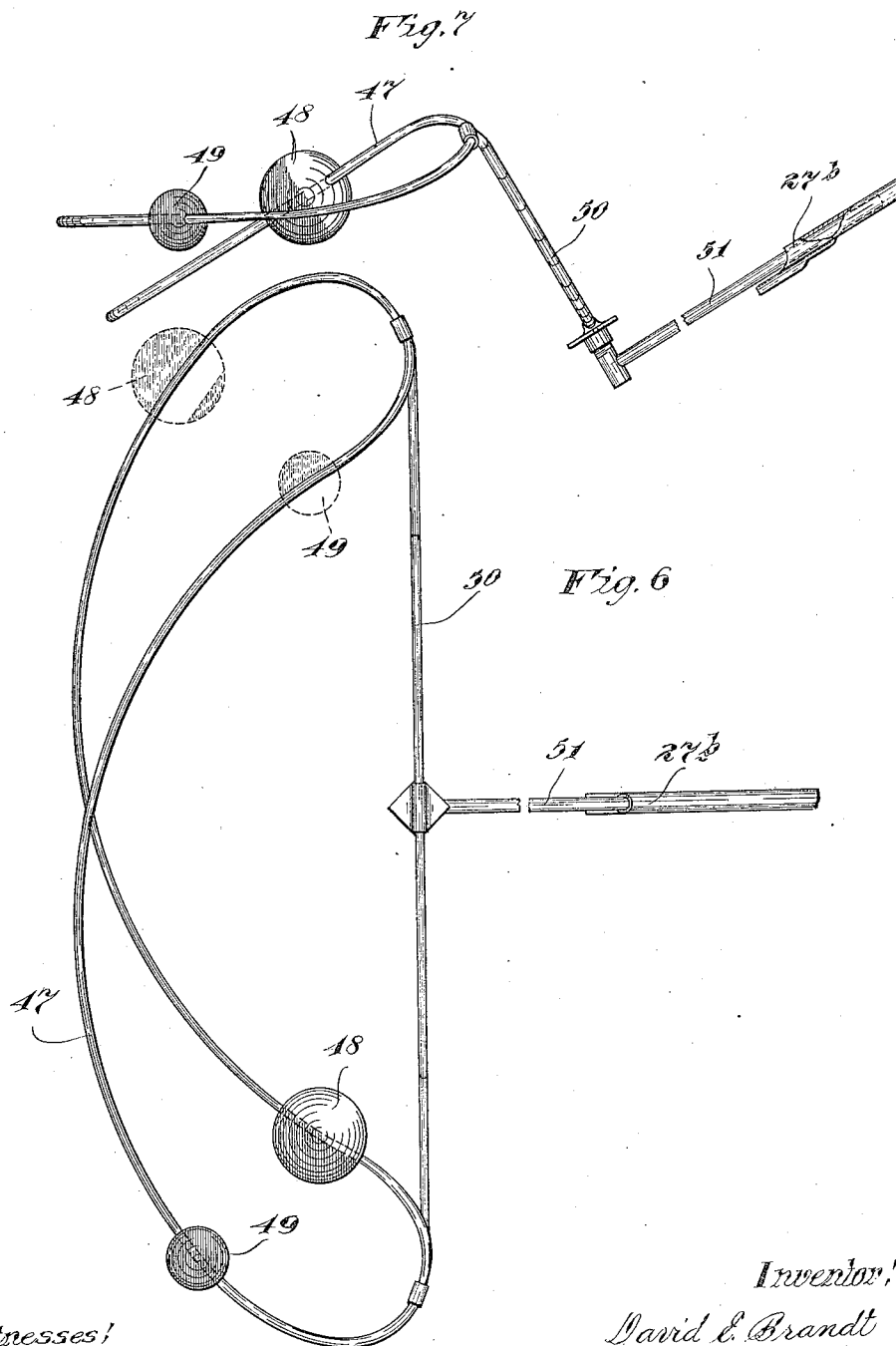
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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TELLURIAN.

1,045,808.

Specification of Letters Patent.

Patented Dec. 3, 1912.

Application filed December 14, 1911. Serial No. 665,667.

To all whom it may concern:

Be it known that I, DAVID E. BRANDT, a citizen of the United States, residing at Chisago City, in the county of Chisago and State of Minnesota, have invented certain new and useful Improvements in Tellurians; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an efficient tellurian or instrument for showing the operation of the causes which produce the succession of day and night, the changes of the seasons, and various other celestial phenomena, but particularly, the invention is designed as an improvement on that type of tellurian which is disclosed and broadly claimed in my prior application, S. N. 625,197, filed of date, May 5th, 1911.

The invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a plan view showing the improved apparatus, some parts being broken away; Fig. 2 is a side elevation of the apparatus; Fig. 3 is a view partly in section and partly in side elevation, and with some parts broken away, showing the mechanism for supporting the earth's globe, and for imparting the proper rotary and other movements thereto; Fig. 4 is a detail in section on the line $x^4 x^4$ on Fig. 3; Fig. 5 is a fragmentary view in elevation showing portions of the means for supporting a hoop representing the earth's orbit; Fig. 6 is a plan view showing an auxiliary device or attachment for illustrating the eclipse of the sun and the moon; Fig. 7 is a side elevation of the parts shown in Fig. 6; and Fig. 8 is a view partly in section and partly in side elevation, some parts broken away.

The numeral 1 indicates a supporting pedestal, to the upper end of the stem of which is rigidly secured a supporting fork 2. The lower end of a bearing sleeve 3 is pivotally connected to the prongs of the fork 2 in angular adjustments in respect to a vertical, and these angular adjustments thereof, are adapted to be varied, preferably through a link 4, pivotally connected to a projecting arm 5 of the said sleeve 3, and at its lower end, pivoted to a lug on a vertically adjust-

able head 6, which latter is arranged to slide vertically on the stem of the pedestal 1 and is adapted to be held in different positions by a set screw 7.

The numeral 8 indicates a graduated dial plate marked to indicate the succession of the seasons and other phenomena relating to the position of the earth in respect to the sun. This dial plate 8 is shown as secured to a disk 9 that is rigidly secured to the sleeve and lies in a plane in respect to which the inclined axis of the sleeve 3 is oblique. Rigidly secured to the upper portion of the sleeve 3 is a hub 10 provided with a non-rotary spur gear 11, the face of which is parallel to the face of the graduated dial 8. On the upper face of the gear 11 is an annular track flange 12, the purpose of which will hereinafter appear.

The numeral 13 designates a light wire hoop or band that represents the plane of the earth's orbit and which is normally supported in an oblique plane inclined in the same direction but having less lateral inclination than the said dial 8 and the track flange 12 of the gear 11.

As shown, the orbital hoop 13 is supported from the pedestal 1 by a pair of long curved rods 14 and 15, the former of which has an extended end that serves to support an electric lamp 16 that represents the sun, and remains in a stationary position at the axis of the orbital band 13. The connection between the supporting rod 14 and the orbital hoop 13 is preferably adjustable by means of a pin 17, that is engageable through any one of either of two holes 18, formed in said rod 14, and is projected into a seat in a collar 19 secured on the said orbital hoop 13 (see Fig. 2).

An oblique operating shaft 20 extends through and is journaled in the sleeve 3, and in the hub of the gear 11, and is capable of endwise movements therein. The axis of this shaft 20 is not perpendicular to the endless track 12 on the gear 11, but stands at an oblique angle to the said track for a purpose which will presently appear. At its lower end, the operating shaft 20 is shown as provided with a crank 21 by means of which it may be rotated, but it may be rotated by any suitable means, either automatically, or otherwise. Above the gear 11, the shaft 20 is provided with a laterally projecting arm 22 provided with a roller 23 that runs on the endless track 12. At

its upper end, the operating shaft 20 carries a counter weight 24, a gear supporting arm 25, a reflector supporting arm 26, and a globe supporting arm 27. The gear supporting arm 25 has a removable outer end portion or yoke-like frame, which is telescoped into the main body of said arm and held by a set screw 26^a. The globe supporting arm 27 has an adjustable and detachable outer end section 27^a secured thereto by a set screw 28. The arm section 27^a, at its outer end has an inverted cup-shaped head 29 formed with a large central passage 30 and provided with a detachable bottom piece 31 secured thereto by friction, or otherwise, and provided with a central opening 32 and preferably, also, with a projecting finger-piece 33. The passage 32 is of considerably less diameter than the passage 30, above noted.

The earth globe 34 is provided with a spindle 35 projecting from the poles thereof, and the lower end of which is extended loosely through the above noted perforations 30 and 32, and is provided with a flange 36 that runs on the top of the head 29 and permits the earth's globe to wobble and rotate in respect to the arm 27, so that the poles of the earth globe will maintain the proper varying inclination in respect to the earth's orbit. The globe spindle 35 is provided with a small sheave 37, as best shown in Fig. 3. A cross belt 38 runs over the sheave 37 and over a larger sheave 39 secured to a short counter shaft 40 journaled on the arm 25, and provided with a small under pinion 41. The pinion 41 meshes with a spur gear 42 on the upper end of a counter shaft 43, which is also carried by the arm 25. The counter shaft 43, at its lower end, is provided with a spur pinion 44 that meshes with the non-rotary gear 11. By the driving connections just described, the earth globe 34 will be rotated on its own axis with a properly timed action, as it is revolved around the sun lamp 16, by rotary movements of the operating shaft 20 and parts carried thereby.

The arm 26 supports and carries a reflector 45 which is always held close to the sun lamp 16 and opposite to the earth globe 34. The numeral 46 indicates a pointer carried by the arm 25, and which works over the dial 8 and coöperates with the said dial to indicate various changing phenomena which results from the revolution of the earth around the sun.

When the earth globe is revolved around the sun lamp, the roller 23 on the arm 22 of the operating shaft 20 produces an upward endwise movement of the said shaft and parts carried thereby, and under the other half rotation, produces a downward or lowering movement of the said shaft and parts carried thereby. This rise and fall of the

said shaft and the parts carried therewith, is due to the fact that the endless track 12 is in a plane that is oblique to the axis of the said shaft 20. Also, since the said track 12 is in a plane which has a greater inclination than the orbital hoop 13, it further follows that the earth globe will be caused to rise and fall bodily in respect to the orbital hoop.

The above rotary and endwise movements of the shaft 20 impart the proper illustrative movement to the earth globe, and causes the eclipse line to correspond to the earth's orbit once every twenty-four hours. On Fig. 2, the equator line of the earth globe is indicated at y , and the eclipse line is indicated at y^1 .

When the orbital hoop 13 is adjusted by placing the pin 17 in the lower hole 18, Fig. 2, the said hoop will then represent the plane of the "Milky Way". This adjustment will, therefore, serve to illustrate why it is that a person at a particular point on the globe, is able to see the "Milky Way" during a part of the year, and is not able to see the same during certain other portions of the year.

Referring now to the device shown in Figs. 6 and 7, it should be stated that when this device is to be applied, the numeral 47 indicates a wire loop representing an assumed section of the complex orbit of the earth and moon and upon which are mounted to slide, spherical bodies 48 and 49 representing, respectively, the earth and the moon. This orbital wire 47 is secured to a tie bar 50 having a stem 51 that is adapted to be inserted into the tubular end 27^b of the arm 27, when the arm section 27^a and the earth globe are detached. When this auxiliary device is attached to an arm 27, the relative position of the earth and moon in respect to the sun, and which causes the eclipses of the moon and of the sun, may be demonstrated.

What I claim is:

1. In a tellurian, the combination with a support and an object representing the sun, of a globe supporting arm, an earth globe carried by said arm, and means for rotating said arm and for raising and lowering the same to thereby raise and lower the earth globe in respect to the sun as it is revolved around the sun.

2. In a tellurian, the combination with a support and an object representing the sun, of a globe supporting arm, an earth globe connected to said arm for wobbling movements to thereby maintain its axis always approximately parallel to an original position, means for revolving said arm and for raising and lowering the same to thereby raise and lower the earth in respect to the sun, as it is revolved around the sun, and means for rotating the earth globe with a

properly timed action as it is revolved around the sun.

3. In a tellurian, the combination with a support, an object representing the sun and a band indicating the plane of the earth's orbit, of a shaft having its axis inclined in respect to a perpendicular and in respect to the plane of said orbital band, an arm carried by said shaft, an earth globe carried by said arm, a track or runway surrounding said shaft and having its plane set oblique with respect thereto, means supporting said shaft from said track or runway with freedom for both rotary and axial movements, and means for rotating said shaft with respect to said track or runway to thereby raise and lower the earth globe in respect to the sun, as it is revolved around the sun.

4. In a tellurian, the combination with a support, an object representing the sun and a band indicating the plane of the earth's orbit, of a shaft journaled in said support for rotary and endwise movements and having its axis inclined in respect to the plane of said orbital band, an endless track in a plane that is slightly oblique to the plane of said shaft, an arm carried by said shaft and running on said endless track, the said track serving to move said shaft endwise, when the latter is rotated, to thereby raise and lower the earth globe in respect to the plane of said orbital band as it is revolved around the sun.

5. In a tellurian, the combination with a support, an object representing the sun and a band indicating the plane of the earth's orbit, of a shaft journaled in said support for rotary and endwise movements and having its axis inclined in respect to the plane of said orbital band, an endless track in a plane that is slightly oblique to the plane of said shaft, an arm carried by said shaft and running on said endless track, the said track serving to move said shaft endwise, when the latter is rotated, to thereby raise and lower the earth globe in respect to the plane of said orbital band as it is revolved around the sun, a non-rotary gear, and co-operating means for rotating said earth

globe, including a gear carried by said arm and meshing with said non-rotary gear.

6. In a tellurian, the combination with an earth globe and means for supporting and revolving the same, of an orbital band made adjustable so that in one position it will indicate the plane of the earth's orbit and in another position will indicate the plane of the "Milky Way."

7. In a tellurian, the combination with an earth globe and means for supporting and revolving the same, of an orbital band made adjustable so that in one position it will indicate the plane of the earth's orbit, and in another position will indicate the plane of the "Milky Way," and a lamp indicating the sun, supported at the axis of said orbital band.

8. In a tellurian, the combination with a support, an object representing the sun and a band indicating the plane of the earth's orbit, of a shaft journaled in said support for rotary and endwise movements and having its axis inclined in respect to the plane of said orbital band, an endless track in a plane that is slightly oblique to the plane of said shaft, an arm carried by said shaft and having a roller running on said endless track, the said track serving to move said shaft endwise, when the latter is rotated, to thereby raise and lower the earth globe in respect to the plane of said orbital band as it is revolved around the sun, a non-rotary gear, and coöperating means for rotating said earth globe, including a gear carried by said arm and meshing with said non-rotary gear.

9. In a tellurian, the combination with a rotatable arm and an object representing the sun, of a looped band or guide adapted to be supported and carried by said arm, and bodies slidably mounted on said guide and representing, one the earth and the other the moon.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID E. BRANDT.

Witnesses:

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HARRY D. KILGORE.